

**Manitoba Hydro 2014/15 & 2015/16 General Rate Application
COALITION/MH-I-81a**

Section:	Tab 4	Page No.:	pp. 2&3 of 26
Topic:	Capital Expenditure Forecast		
Subtopic:	Capital Project Justification (CPJ)		
Issue:	Understand CPJ and prioritization process		

PREAMBLE TO IR (IF ANY):

A Capital Project Justification is initiated when a capital project is identified as it is stated on page 2 of 26 tab 4. The CPJ contains information that identify the needs for the project. Furthermore; CPJs are examined to confirm the need based on a number of criteria. In addition, Manitoba Hydro assesses the proposed projects and whether projects of lesser priority can be displaced.

QUESTION:

Please provide supporting CPJ documentation justifying all new projects included in the CEF 2014.

RATIONALE FOR QUESTION:

Confirm the prudence and reasonableness of the new projects included in the CEF 2014 and test whether cost effective prioritization is taking place. Does not duplicate PUB/Hydro 1-17 - 1-26.

RESPONSE:

The following twenty-two new CPJs included in CEF14 are attached.

	Project	Total Project Cost
Attachment 1	Adelaide Station	\$ 62.106
Attachment 2	Grand Rapids Hatchery Upgrade and Expansion	\$ 23.509
Attachment 3	York Stn Banks 1,3,5 & Switchgear Addition	\$ 18.481
Attachment 4	Southern AC System Breaker Replacements	\$ 14.693
Attachment 5	Jenpeg Unit 1 Fire Rehabilitation	\$ 14.000
Attachment 6	Souris East Transformer Capacity Enhancement	\$ 11.302
Attachment 7	Jenpeg U4 Partial Mechanical Overhaul	\$ 11.233
Attachment 8	Gen South Roof Replacement Program	\$ 6.339
Attachment 9	Kettle GS Petroleum Storage Facility	\$ 5.043
Attachment 10	Brandon Victoria Stn 115kV Circuit Breaker Repl.	\$ 4.226
Attachment 11	Bipole I&II Failed Anchor Replacement	\$ 3.500
Attachment 12	Anola DSC RM of Springfield	\$ 4.000
Attachment 13	Winkler West DSC	\$ 4.550
Attachment 14	Norway House Bank Addition	\$ 4.000
Attachment 15	Ste. Agathe Stn Bank Addition	\$ 2.100
Attachment 16	Hochfeld DSC	\$ 5.000
Attachment 17	Brandon West 4kV - 12kV Conversion	\$ 4.650
Attachment 18	Glenboro Town 8kV to 25kV Conversion	\$ 2.000
Attachment 19	Relocate L17 to Semple Stn. Underground	\$ 2.300
Attachment 20	Winnipeg Area 66 kV Line Upgrades	\$ 2.031
Attachment 21	Neepawa 66 kV Improvements	\$ 9.501
Attachment 22	Whiteshell Station Bank 1 Replacement	\$ 3.027

TRANSMISSION

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

Southern AC System Breaker Replacements

REVIEWED BY:
(Owning Dept Manager)

Shane Mauley
2014-07-15

NOTED BY:
(if applicable)

[Signature]

Coordinating Division:

Constructing Division:

Designing Division:

Financial: *Blumenberg* 2014.07.11

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager: *Ty Nguyen*
July 11, 2014

Business Unit V.P.: *[Signature]*
2014.07.14
FOR SHANE MAULEY

BUDGET \$: (Total Net Cost)	\$14,693,000
START DATE: (1 st Cost Flow)	2014 03
IN-SERVICE DATE: (Indicate "Mult" if more than 1)	Mult - 2016 11
RISK MATRIX/ BUSINESS CASE TIER:	Tier 1 (1240 pts)
INVESTMENT REASONS:	Employee Safety (76%) Capacity Enhancement (20%) Public Safety (4%)

OWNING DIVISION: TRANSMISSION PLANNING & DESIGN

L.M. NODE NUMBER: 1.1.2.3.62.1

W.B.S. NUMBERS: P:21597

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Chad Gislason - Project Owner
Ty Nguyen - Project Manager TN

DATE PREPARED: 2014 04 01 2014-07-1

REPORT NUMBER: TM-2011/05 & TM-2012/02

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- Safety
- System Supply
- System Reliability
- Customer Service
- Efficiency
- Environmental

NERC COMPLIANCE * YES NO

* Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

**CAPITAL PROJECT JUSTIFICATION
FOR**

**SOURIS EAST TRANSFORMER
CAPACITY ENHANCEMENT**

REVIEWED BY:
(Owning Dept Manager) *[Signature]*
2014/01/31

NOTED BY:
(if applicable)
Coordinating Division: *[Signature]* 2014/05/29
Constructing Division:
Designing Division:

Financial: *[Signature]* 2014.01.17

RECOMMENDED FOR IMPLEMENTATION:
Owning Div. Manager: *[Signature]* 2014 05 29

Business Unit V.P.: *[Signature]* 2014 06 02

BUDGET \$: (Total Net Cost)	\$11,302,000
START DATE: (1 st Cost Flow)	2016 04
IN-SERVICE DATE: (Indicate "Mult" if more than 1)	2019 04
RISK MATRIX/ BUSINESS CASE TIER:	Tier 3 (700 Points)
INVESTMENT REASONS:	Capacity Enhancement (100%)

OWNING DIVISION: Transmission Planning & Design

LM. NODE NUMBER: 1.1.2.4.27.1

W.B.S. NUMBERS: P:15989

MAJOR ITEM **DOMESTIC ITEM**

PREPARED BY: Joshua Shewchuk, Project Owner
Locky Miller, Project Manager *[Signature]* 2014/01/12

DATE PREPARED: 2013.09.19

REPORT NUMBER: SPD 2012/03

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input type="checkbox"/> Safety	<input type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE* YES NO

* Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

**Brandon Victoria Ave. Station
115kV Circuit Breaker Replacements**

REVIEWED BY:
(Owning Dept Manager)

*DAVID WONSIAK
2014/06/02*

NOTED BY:
(if applicable)

Coordinating Division:

Oliver 2014.06.11

Constructing Division:

Designing Division:

Financial:

Ammerberg 2014.06.11

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

G. Neufeld 11 06 14

Business Unit V.P.:

A. Mailey 14 06 11

BUDGET S: (Total Net Cost)	\$4,226,000
START DATE: (1 st Cost Flow)	2016 04
IN-SERVICE DATE: (Indicate "Mult" if more than 1)	Mult - 2019 10
RISK MATRIX/ BUSINESS CASE TIER:	Tier 2 (980 points)
INVESTMENT REASONS:	Employee Safety (80%) Equipment Protection (20%)

OWNING DIVISION:

Transmission Planning & Design

I.M. NODE NUMBER:

1.1.2.3.56.1

W.B.S. NUMBERS:

P:21768

MAJOR ITEM

DOMESTIC ITEM

PREPARED BY:

M.R. Wonsiak, Project Owner *MRW/21405*
T.P. Akhi, Project Manager *TPA 2014/05*

DATE PREPARED:

2014 03 11

REPORT NUMBER:

SPD 2012/13

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:

Indicate key project driver(s):

- | | |
|--|---|
| <input checked="" type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input checked="" type="checkbox"/> System Reliability | <input type="checkbox"/> Environmental |

NERC COMPLIANCE * YES NO

* Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

Bipole I&II Failed Anchor Replacement

REVIEWED BY:
(Owning Dept Manager)

[Signature] 11/14/11

NOTED BY:
(if applicable)

Coordinating Division:

[Signature] 11/14/11

Constructing Division:

[Signature] 2014/11/14

Designing Division:

Financial

[Signature] 2014.12.01

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

[Signature] 2014/12/01

Business Unit V.P.:

A. Nailby Dec 1, 2014

BUDGET \$: (Total Net Cost)	\$3,500,000
START DATE: (1 st Cost Flow)	2014 11
IN-SERVICE DATE: (Indicate "Mult" if more than 1)	2015 03
RISK MATRIX/ BUSINESS CASE TIER:	Mandatory (scored at 1690 points)
INVESTMENT REASONS:	System Emergencies (90%) Employee Safety (5%) Public Safety (5%)

OWNING DIVISION:

TRANS CONSTRUCTION & LINE MAINTENANCE

LM. NODE NUMBER:

1.1.2.3.66.1

W.B.S. NUMBERS:

P:24073

MAJOR ITEM

DOMESTIC ITEM

PREPARED BY:

J. Schmidt on behalf of
D. Day, Project Owner
J. Peterson, Project Manager *[Signature]*

DATE PREPARED:

2014 11 06

REPORT NUMBER:

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION: Indicate key project driver(s):	
<input checked="" type="checkbox"/> Safety	<input type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE * YES NO

* Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

WHITESHELL STATION BANK 1 REPLACEMENT

REVIEWED BY: *[Signature]*
(Owning Dept Manager)

NOTED BY:
(if applicable)

Coordinating Division: *[Signature]* 2014/02/24

Constructing Division:

Designing Division:

Financial: *[Signature]* 2014.01.07

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager: *[Signature]*
2014 02 20

Business Unit V.P.: *[Signature]*
2014 02 27

BUDGET \$: (Total Net Cost)	\$3,027,000
START DATE: (1 st Cost Flow)	2016 04
IN-SERVICE DATE: (Indicate "Mult" if more than 1)	2017 11
RISK MATRIX/ BUSINESS CASE TIER:	Tier 3 (700 points)
INVESTMENT REASONS:	Capacity Enhancement (100%)

OWNING DIVISION: TRANSMISSION PLANNING & DESIGN

LM. NODE NUMBER: 1.1.2.3.19.1

W.B.S. NUMBERS: P:19764

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Joshua Shewehuk - Project Owner
Ty Nguyen - Project Manager

DATE PREPARED: 2013 09 27 TN 2014-01-21

REPORT NUMBER: SPD 2010/08

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input type="checkbox"/> Safety	<input type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE * YES NO

* Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

DISTRIBUTION

2014/15 & 2015/16 Electric General Rate Application

APPROVED BY EXECUTIVE COMMITTEE
MINUTE # 1485.02

DATE: 2014 05 20
Financial Planning

CAPITAL PROJECT JUST
FOR

Adelaide Station

REVIEWED BY:
(Owning Dept Manager)

Charles Stuh, P. Eng. 2014 03 28

NOTED BY:
(if applicable)

Coordinating Division:

2014-03-24

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Adelaide 2014 03 28

Business Unit V.P.:

Burt Reid 2014-04-14

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- Safety
- System Supply
- System Reliability
- Customer Service
- Efficiency
- Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

BUDGET \$: (Total Net Cost)	\$62,106,000
START DATE: (1 st Cost Flow)	2013 09
IN-SERVICE DATE: (Last Major In-service Date)	Multi - 2020 03

OWNING DIVISION: G13800 / Distribution E&C Winnipeg

LM. NODE NUMBER: 1.10.3.6.5.1

W.B.S. NUMBERS: P:23102

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Kristin Braid
K. Braid, P. Eng. 2014 03 20

DATE PREPARED: 2014 03 06

REPORT NUMBER: 9357

FILE NUMBER (Optional):

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

**York Station
Banks 1, 3, 5 & Switchgear Addition**

REVIEWED BY: *Charles Stuk, P.Eng.*
(Owning Dept Manager) *March 4, 2014*

NOTED BY:
(if applicable)

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Address March 14, 2014

Business Unit V.P.:

Brent [Signature] 2014-03-26

BUDGET \$: (Total Net Cost)	\$18,481,000
START DATE: (1 st Cost Flow)	2013 03
IN-SERVICE DATE: (Last Major In-service Date)	2016 06

OWNING DIVISION: G13800 / Distribution E&C Winnipeg

I.M. NODE NUMBER: 1.1.3.6.49.1

W.B.S. NUMBERS: P:21452

MAJOR ITEM **DOMESTIC ITEM**

PREPARED BY: *Kristin Braid, P. Eng.*
K. Braid, P. Eng.
2014 02 28

DATE PREPARED: 2013 12 30

REPORT NUMBER: 8446

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- | | |
|--|---|
| <input type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input checked="" type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input checked="" type="checkbox"/> System Reliability | <input type="checkbox"/> Environmental |

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

Anola DSC RM of Springfield

REVIEWED BY:
(Owning Dept Manager)

H. Braid 2014-09-18

NOTED BY:
(if applicable)

[Signature] 2014-09-18

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Cheri Stuk 2014 09 16

Business Unit V.P.:

[Signature] 2014-10-07

BUDGET \$: (Total Net Cost)	\$4,000,000
START DATE: (1 st Cost Flow)	2013 07
IN-SERVICE DATE: (Last Major In-service Date)	2015 07 30

OWNING DIVISION: G13800 / Distribution E&C Winnipeg

I.M. NODE NUMBER: 1.1.3.6.51.1

W.B.S. NUMBERS: P:21933

MAJOR ITEM **DOMESTIC ITEM**

PREPARED BY: Harinder Sawhney *[Signature] 10/9/2014*

DATE PREPARED: 2014 04 08

REPORT NUMBER: DEW-W14-03

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:

Indicate key project driver(s):

- | | |
|--|---|
| <input type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input checked="" type="checkbox"/> System Reliability | <input type="checkbox"/> Environmental |

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

Winkler West DSC

REVIEWED BY:
(Owning Dept Manager)

Allen P. Paschall
2014 01 17

NOTED BY:
(if applicable)

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager: *JP Hall* 2014 02 21

Business Unit V.P.:

Burt [Signature] 2014-02-25

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

BUDGET \$: (Total Net Cost)	\$4,550,000
START DATE: (1 st Cost Flow)	2012 06
IN-SERVICE DATE: (Last Major In-service Date)	2014 11

OWNING DIVISION: G13700 / Distribution E&C Rural

I.M. NODE NUMBER: 1.1.3.8.26.1

W.B.S. NUMBERS: P:19794

MAJOR ITEM **DOMESTIC ITEM**

PREPARED BY: Rodney Boychuk

RB 2014/01/17

DATE PREPARED: 2014 01 08

REPORT NUMBER: 7892

FILE NUMBER (Optional):

12

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

Norway House Bank Addition

REVIEWED BY: (Owning Dept Manager)

Allen Richard 2014 03 07

NOTED BY: (if applicable)

Coordinating Division:

Constructing Division:

Financial Department: (if over \$1 million)

BUDGET \$: (Total Net Cost)	\$4,000,000
START DATE: (1 st Cost Flow)	2015 01
IN-SERVICE DATE: (Last Major In-service Date)	June 2016

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager: [Signature] 2014 03 19

Business Unit V.P.: [Signature] 2014 03 20

OWNING DIVISION: G13700 / Distribution E&C Rural

LM. NODE NUMBER: 1.1.3.8.27.1

W.B.S. NUMBER: P:22935

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Boychuk, Rodney [Signature] 2014/03/07

DATE PREPARED: 2014 02 05

REPORT NUMBER: 9264

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

Ste Agathe Stn Bank Addition

REVIEWED BY: (Owning Dept Manager)

Alenka Borhan 2014 05 12

NOTED BY: (if applicable)

BUDGET \$: (Total Net Cost)	\$2,100,000
START DATE: (1 st Cost Flow)	2016 01
IN-SERVICE DATE: (Last Major In-service Date)	2016 09 30

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

OWNING DIVISION: G13700 / Distribution E&C Rural

L.M. NODE NUMBER: 1.1.3.8.28.1

W.B.S. NUMBERS: P:20766

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Charles Steh 2014 05 15

Business Unit V.P.:

Brent [Signature] 2014 05 05

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Rodney Boychuk

DATE PREPARED: 2014 04 08

REPORT NUMBER: 9076

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION
FOR

Hochfeld DSC

REVIEWED BY:
(Owning Dept Manager)

Alvin Schubert 2014 04 08

NOTED BY:
(if applicable)

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Charles Stule 2014 05 05

Business Unit V.P.:

Brent [Signature] 2014-05-16

BUDGET \$: (Total Net Cost)	\$5,000,000
START DATE: (1 st Cost Flow)	May 2013
IN-SERVICE DATE: (Last Major In-service Date)	August 2015

OWNING DIVISION: G13700 / Distribution E&C Rural

I.M. NODE NUMBER: 1.1.3.8.25.1

W.B.S. NUMBERS: P21652

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Boychuk, Rodney *[Signature]* 2014/04/01

DATE PREPARED: 2014 03 07

REPORT NUMBER: 8523

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- Safety
- System Supply
- System Reliability
- Customer Service
- Efficiency
- Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

15

2014/15 & 2015/16 Electric General Rate Application

MANITOBA HYDRO CAPITAL PROJECT JUSTIFICATION

D1876

CAPITAL PROJECT JUSTIFICATION FOR

Brandon West 4kV - 12kV Conversion

REVIEWED BY:
(Owning Dept Manager)

JAC
Melvin P. ... 20140307

NOTED BY:
(if applicable)

JAC 20140224

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager: *Op ... 20140318*

Business Unit V.P.: *Bunt ... 2014-03-25*

BUDGET \$: (Total Net Cost)	\$4,650,000
START DATE: (1 st Cost Flow)	2014 04
IN-SERVICE DATE: (Last Major In-service Date)	2016 12

OWNING DIVISION: G13700 / Distribution E&C Rural

I.M. NODE NUMBER: 1.1.3.9.14.1

W.B.S. NUMBERS: P:22894

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Shelvey, Daryn *DS 2014-02-21*

DATE PREPARED: 2014 01 28

REPORT NUMBER: 8872

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- | | |
|--|---|
| <input type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input checked="" type="checkbox"/> System Reliability | <input type="checkbox"/> Environmental |

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application
MANITOWA HYDRO
CAPITAL PROJECT JUSTIFICATION

D1876

**CAPITAL PROJECT JUSTIFICATION
FOR**

Glenboro Town 8kV to 25kV Conversion

REVIEWED BY: *JAC*
(Owning Dept Manager)
Memorandum 2014 05 07
NOTED BY:
(if applicable)

Coordinating Division: *JAC*

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:
Chas Steel 2014 05 12

Business Unit V.P.:
Burt [Signature] 2014-06-05

BUDGET \$: (Total Net Cost)	\$2,000,000
START DATE: (1 st Cost Flow)	2004 07
IN-SERVICE DATE: (Last Major In-service Date)	2015 10 31

OWNING DIVISION: G13700 / Distribution E&C Rural

I.M. NODE NUMBER: 1.1.3.9.15.1

W.B.S. NUMBERS: P:11883

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: Shelvey, Daryn *[Signature]*
2014-05-05

DATE PREPARED: 2014 04 14

REPORT NUMBER: 8965

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input type="checkbox"/> Safety	<input type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

17

CAPITAL PROJECT JUSTIFICATION FOR

Relocate L17 to Semple Stn. Underground

REVIEWED BY: (Owning Dept Manager)

Braid 2014-09-18

NOTED BY: (If applicable)

H 2014-09-16

Coordinating Division:

J Hunt 2014-09-16

Constructing Division:

Financial Department: (if over \$1 million)

BUDGET \$: (Total Net Cost)	\$2,300,000
START DATE: (1 st Cost Flow)	2014 09
IN-SERVICE DATE: (Last Major In-service Date)	2015 05

OWNING DIVISION: G13800 / Distribution Eng & Construction Division

LM NODE NUMBER: 1.1.3.10.10.1

W.B.S. NUMBERS: P23621

MAJOR ITEM DOMESTIC ITEM

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Chris Stul 2014 09 16

Business Unit V.P.:

Brent Reed 2014-10-07

PREPARED BY: Young, Tyler T.Y. 2014-09-11; Henry 2014-09-11

DATE PREPARED: 2014 08 12

REPORT NUMBER: 9620

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION: Indicate key project driver(s):

- Safety
- System Supply
- System Reliability
- Customer Service
- Efficiency
- Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

Winnipeg Area 66 kV Line Upgrades

REVIEWED BY: *AV* 2014 05 28
(Owning Dept Manager)

K Braid 2014 05 20

NOTED BY: *JK* 2014-05-28
(if applicable)

JK 2014-05-28

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

Chad Stuh 2014 05 30

Business Unit V.P.:

Don't Ref 2014-06-05

BUDGET \$: (Total Net Cost)	\$2,031,000
START DATE: (1 st Cost Flow)	2014 04
IN-SERVICE DATE: (Last Major In-service Date)	2019 12

OWNING DIVISION: G13800 / Distribution E&C Winnipeg

I.M. NODE NUMBER: 1.1.3.10.12.1

W.B.S. NUMBERS: P:23255, P:23258, P:23259,
P:23260, P:23261, P:23268

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: T. Pickering *T.P.* 2014-05-28

DATE PREPARED: 2014 04 07

REPORT NUMBER: 9444

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:

Indicate key project driver(s):

- | | |
|---|---|
| <input checked="" type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input checked="" type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input type="checkbox"/> System Reliability | <input type="checkbox"/> Environmental |

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application

**CAPITAL PROJECT JUSTIFICATION
FOR**

Neepawa 66 kV Improvements

REVIEWED BY:
(Owning Dept Manager)

W. Verch 20140403

NOTED BY:
(if applicable)

*Allyson R. Paschall 20140328
Chris Stroh, P.Eng. 2014 04 15*

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

*W. Verch
APRIL 16, 2014*

Business Unit V.P.:

Burt [Signature] May 23/14

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- | | |
|--|---|
| <input type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input checked="" type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input checked="" type="checkbox"/> System Reliability | <input type="checkbox"/> Environmental |

BUDGET \$: (Total Net Cost)	\$9,501,000
START DATE: (1 st Cost Flow)	2014 05
IN-SERVICE DATE: (Last Major In-service Date)	2016 10
RISK MATRIX/ BUSINESS CASE TIER: (Optional)	
INVESTMENT REASONS: (Optional)	

OWNING DIVISION:

Distribution E&C Rural

I.M. NODE NUMBER:

1.1.3.11.2.1

W.B.S. NUMBERS:

P:22996, P:22997, P22998

MAJOR ITEM

DOMESTIC ITEM

PREPARED BY:

G. Verch

W 2014 04 03

DATE PREPARED:

2014 02 10

REPORT NUMBER:

FILE NUMBER (Optional):

NERC COMPLIANCE*: YES NO

*Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

GENERATION

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

JENPEG UNIT 1 FIRE REHABILITATION

REVIEWED BY: (Owning Dept Manager)

M. Rad 2014 02 27

NOTED BY: (if applicable)

Coordinating Division:

Constructing Division:

H. Krenl. P. Eng 2014 02 27

Financial Department: (if over \$1 million)

B. Bouhmi 2014 02 27

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

K. Gaudin 2014 02 27

Business Unit V.P.:

A. M. 2014-03-02

PRIMARY JUSTIFICATION:

Indicate key project driver(s):

- Safety
- System Supply
- System Reliability
- Customer Service
- Efficiency
- Environmental

BUDGET \$: (Total Net Cost)	\$14,000,000
START DATE: (1 st Cost Flow)	2014 03
IN-SERVICE DATE: (Last Major In-service Date)	2015 11
RISK MATRIX/ BUSINESS CASE TIER: (Optional)	
INVESTMENT REASONS: (Optional)	

OWNING DIVISION:	Generation South
LM. NODE NUMBER:	1.1.1.3.7.4
W.B.S. NUMBERS:	P:21120
MAJOR ITEM <input checked="" type="checkbox"/>	DOMESTIC ITEM <input type="checkbox"/>
PREPARED BY:	J. Austman <i>JTA J.G.</i>
DATE PREPARED:	2014 02 21
REPORT NUMBER:	4432
FILE NUMBER (Optional):	

NERC COMPLIANCE*: YES NO

*Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

MANITOBA HYDRO
 2014/15 & 2015/16 Electric General Rate Application
CAPITAL PROJECT JUSTIFICATION

Project Name

Jenpeg Unit 1 Fire Rehabilitation

Recommendation

Approve a budget of \$14.0 M to repair the fire damage to Jenpeg Unit 1, perform a mechanical condition assessment of high risk components and return the Unit to service.

Project Scope

The scope of the project includes the design supply and installation of the following components.

- generator breaker and terminal cubicle instrument transformers/apparatus
- excitation system
- generator control (sequencer controls), metering and operator interface
- generator and transformer protection
- generator disconnect
- generator breaker
- governor control head
- unit annunciator
- deluge controls
- rotor turning system and turning bridge
- restoration and repair of the Series 5 unit PLCs.
- AC isolated phase bus
- line side generator CTs and PTs
- generator step up transformer interfacing
- restoration of the U1 interlocking scheme
- powerhouse tailrace wall repair

In addition, the scope also includes the following mechanical items in order to gain condition assessment information for future overhaul planning. Non-intrusive methods will be utilized, where appropriate, to minimize cost, time and damage risks:

- Outer / Inner Wicket Gate Ring Eccentricity Survey
- Water passage Inspection
- Bearing Inspections (#1, 2, 3)
- Runner Inspection
- Generator Shaft Non Destructive Examination (NDE)
- Turbine Shaft NDE
- Operating Linkages & Bushing Inspection
- Verify Manual Greasing Operation
- Oil Head Inspection
- Water Head Inspection
- Pedestal Inspection
- Bulb Internal and External Connection NDE
- Bearing Cooler Piping Inspection
- Heat Exchanger Piping Inspection
- DIW System Inspection

2014/15 & 2015/16 Electric General Rate Application

Project Scope

- Discharge Ring & Wicket Gate Rings, NDE & Thickness Checks
- Exposed Water Passage NDE & Thickness Checks
- Operating Ring Inspection
- Rotor (Mechanical)
- Stator (Mechanical)
- Thrust Bearing Inspection
- Hatch NDE (Bulb Cover)
- Wicket Gate NDE

Cost Category	Amount in Millions	
Construction/Material	\$	8.7
Accommodations/Travel	\$	1.4
Site Labour	\$	1.0
Project Management	\$	1.0
Engineering	\$	0.9
Interest	\$	0.6
Escalation	\$	0.4
Grand Total	\$	14.0

Background

On Sunday, November 4, 2012, an electrical fire occurred at the generator breaker in the Jenpeg Unit 1 generator terminal cubicle (GTC) located at elev. 691.0'. The fire was contained to the area surrounding the GTC, but the majority of the equipment in this location requires a complete replacement due to the resulting damage. Unit 1 is currently on a forced outage due to the damage sustained during the fire.

Given that the unit is currently out of service a number of opportunity items have been identified in order to perform condition assessment or repairs. Major disassembly work with respect to the water passage, turbine and generator are explicitly not included in this CPJ's scope of work, however, there are known failure modes associated with the Jenpeg units that may need to be investigated further. For example, Jenpeg Units 4 and 6 have experienced restoring rod failures. Replacing this component requires dismantling the water passage and turbine components. The total cost of Jenpeg Unit 4 restoring rod replacement work is approximately \$8 M and requires upwards of 8 months of construction to complete.

Each unit at the Jenpeg Generating Station produces 28 MW. Currently, outage costs are estimated at \$11,000 per day.

The rehabilitation scope outlined above will be initiated and followed out with the global objective of returning all equipment to service for safe and reliable operation.

2014/15 & 2015/16 Electric General Rate Application

JUSTIFICATION—BUSINESS CASE ANALYSIS (SUMMARY):

Justification and Link to Corporate/Business Unit Goals

Returning Jenpeg Unit 1 to service will return 31.1 MVA to Manitoba Hydro's bulk electric system. Approximately 28 MW would be available for export and domestic load. In order to return the unit to service, the damage caused by the fire must be repaired. The outage costs are estimated to be \$11,000 per day (~\$4.0 M per year). Given the estimated project cost, the project will pay for itself within 4 years.

The project supports the following corporate goals:

- Provide a reliable and dependable supply of power to meet all customers' requirements - *continuously improve generating station reliability and capability as required to optimize operations of the system*
- Optimize operations, exports and development to minimize net cost to Manitoba customers - *Reduce duration of outages*

ANALYSIS OF ALTERNATIVES:

Economic Analysis

Discount Rate	For current corporate rates see G811 5.4%	For clarification on hurdle rates, contact the Economic Analysis Department
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Recommended Option	NPV Benefits (Costs)
Repair the fire damage to Jenpeg Unit 1, perform a mechanical condition assessment of high risk components and return the Unit to service.	

Other Alternatives Considered	NPV Benefits/(Costs)
N/A	

Risk Analysis

Scope creep: Due to the expedited nature of this project, there will be scope risk as the bounds of the project are not fully known nor is it fully defined to the vendors. This will be managed through the contract negotiation and change management processes.

After the fire occurred, the transformer was inspected and passed; however, it experienced a significant fault which carries future risk of an in-service failure.

From a mechanical perspective, there are condition assessment activities to be done. As with all overhauls, disassembling a 35 year old machine may reveal damage or deterioration that must be fixed in order for the unit to be put safely back in service. Jenpeg Unit 4 restoring rod replacement project is currently underway which may identify further areas of concern on Unit 1. Given the current level of mechanical engineering resources available, there is a risk that condition assessment efforts may become critical path.

Further to this risk, if a component, such as the restoring rod, requires replacement, the total project cost and duration will increase. For reference, Jenpeg Unit 4 resorting rod replacement is estimated to be \$8 M and requires upwards of 8 months of construction time to complete. Depending on the timing of the discovery, this may delay the in service date of the unit. Also, further Mechanical Engineering resources would be required to support the additional scope.

2014/15 & 2015/16 Electric General Rate Application

Risk Analysis

Major civil works associated with beams and slabs are not included in this request but could form part of the scope if they are found to be in poor condition during execution of the work. Only minor cladding repair is included in this estimate.

An internal Scope Change Request process, with formal approval signoff cycle, is currently in place to mitigate and maintain the risk of adding unnecessary or low-priority work to the project.

Major contracts award: A contract must be issued in a timely manner for the design, supply and installation of the electrical equipment required to return the unit to service as scheduled. The evaluation matrix takes into consideration the amount of time that it may take to resolve technical and commercial issues. This is intended to minimize the total cost impact to Manitoba Hydro.

Capital budget constraint: The availability of capital funding is limited for the next few years. The overall Generation Operations capital budget will need to be managed to ensure higher priority jobs are completed first. It is expected that because this unit has failed that it will be included in the recommended portfolio.

Availability of internal resources: Internal resources for Project Management, design review and condition assessment must be secured and made available in a timely manner. Staff turnover will have to be managed to ensure it does not significantly impact the course of this project work. Given that the majority of the work will be done by a contractor, this risk is minimized.

Competing projects: Other projects, such as Pine Falls Unit 2, Jenpeg Unit 4, etc., may take precedence and consume resources allocated to this overhaul. In addition, there may be crane conflicts between Jenpeg unit 1 fire repairs and Jenpeg unit 4 restoring rod replacement projects which will affect schedule.

Accommodations: Jenpeg Unit 4 Restoring Rod Repairs are currently underway and the Jenpeg Camp expansion project will not be completed until Fall 2014. To minimize this risk, RFP 038330 stated that Manitoba Hydro has limited accommodations and the contractor will have to supply their own.

2014/15 & 2015/16 Electric General Rate Application

Capital Budget Estimate

Summarize the total capital net cost for the project in thousands of dollars (per the CERs – see Excel table below). CPJs for Major items must be accompanied by at least draft CERs, while CPJs for Domestic items must be accompanied by final CERs.

The annual net budget requirements are as follows (in thousands of dollars):

Fiscal Year	Proposed Budget
Prev. Actuals	\$ -
2013/14	\$ 112
2014/15	\$ 7,242
2015/16	\$ 6,638
2016/17+	\$ -
Total	\$ 13,992

Proposed Schedule

RFP 038330 Contract Award	March 2014
In Service Date	September 30, 2015

Related Projects

Jenpeg Unit 4 Restoring Rod Replacement Project

Reference Documents

J. Kleinsasser: "Conceptual Design Report for Jenpeg Unit 1 Fire Repairs". November 26, 2013

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION

FOR

JPG UNIT 4 PARTIAL MECHANICAL OVERHAUL

REVIEWED BY:
(Owning Dept Manager)

W. H. Reed 2014/06/03

NOTED BY:
(if applicable)

Coordinating Division:

SG - *JA*

JA 2014 06 04

Constructing Division:

Financial Department:
(if over \$1 million)

WCC 2014/06/05

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

R. G. ... 2014 06 04

Business Unit V.P.:

R. G. ... 2014-06-05

PRIMARY JUSTIFICATION:

Indicate key project driver(s):

- Safety
- System Supply
- System Reliability
- Customer Service
- Efficiency
- Environmental

BUDGET \$: (Total Net Cost)	\$11,232,955
START DATE: (1 st Cost Flow)	2013 04
IN-SERVICE DATE: (Last Major In-service Date)	2015 03
RISK MATRIX/ BUSINESS CASE TIER: (Optional)	
INVESTMENT REASONS: (Optional)	

OWNING DIVISION: Generation South

LM. NODE NUMBER: 1.1.1.3.7.3

W.B.S. NUMBERS: P:20045

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: *AF* O.A. Ramirez

DATE PREPARED: 2014 05 13

REPORT NUMBER: 4313

FILE NUMBER (Optional):

NERC COMPLIANCE*: YES NO

*Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

MANITOBA HYDRO

2014/15 & 2015/16 Electrical Project Justification

Project Name
Jenpeg Unit 4 Partial Mechanical Overhaul

Recommendation
Approve a budget of \$11.2 M to refurbish the failed turbine restoring rod in Jenpeg Unit 4, perform mechanical inspections of high risk components and return the Unit to service. Justify additional funds as required for necessary refurbishments resulting from the inspections.

Project Scope
<p>The scope of the project includes :</p> <ul style="list-style-type: none"> - Unit disassembly and removal of runner - Refurbishment of the generator and turbine restoring rod - Unit reassembly and commissioning - Documented procedures and project plan for future failures of remaining units. <p>In addition, the scope also includes the following inspections in order to ensure components meet their estimated useful life. Inspected components will either be confirmed fit for service or refurbished as required to ensure continued operation to the next major overhaul. These refurbishment costs are not currently included in this project and will be added scope requiring justification. These inspections will also provide valuable information for future overhaul planning of other units. Non-intrusive methods will be utilized, where appropriate, to minimize cost, time and damage risks:</p> <ul style="list-style-type: none"> - Outer / Inner Wicket Gate Ring Eccentricity Survey - Bearing pedestal grounding inspection (#1, 2) - Runner Inspection - Generator Shaft Non Destructive Examination (NDE) - Turbine Shaft NDE - Verify Manual Greasing Operation - Oil Head Inspection - Water Head Inspection - Bulb Pedestal Inspection - Bulb Internal and External Connection NDE - Bearing Cooler Piping Inspection - Heat Exchanger Piping Inspection - DIW System Inspection - Exposed Water Passage NDE & Thickness Checks - Rotor Inspection(Mechanical) - Stator Inspection (Mechanical) - Hatch Cover rehab (Bulb Cover) - Wicket Gate NDE inspection procedure

Cost Category	Amount in Millions
Construction/Material	\$ 4.1
Mechanical assessment	\$ 2.0
Accommodations/Travel	\$ 0.7
Site Labour	\$ 0.6
Project Management	\$ 1.2
Engineering	\$ 1.4
Interest	\$ 1.0
Escalation	\$ 0.2
Grand Total	\$ 11.2

Background

Following a head tank oil loss scenario in 2011 of the Unit 3 and 4 governor system it was determined that there was a serious problem with the oil head of Unit 4. Upon further investigation the oil head was not the cause of the oil leak but the turbine restoring rod had completely fractured.

Site mechanics removed the generator restoring rod with a portion of the broken turbine restoring rod via the upstream shaft opening once the oil head and water head were disassembled. However, the remaining portion of the turbine restoring rod cannot be removed until the turbine hub is removed.

Given that the unit is currently out of service a number of condition assessments have been identified and will be carried out in order to provide information to the Generation Operations Asset Management program to aid in the planning of future Jenpeg overhauls. These overhauls will be near \$100M in Capital investments and require information to help set the scope and schedule.

Each unit at the Jenpeg Generating Station produces 28 MW. Currently, outage costs are estimated at \$11,000 per day. The condition assessments will also be used to identify risk of failure items on all units to help minimize or even avoid unplanned outages due to failure of critical components.

The repair scope and condition assessments outlined above have begun (April 2013) and all costs to date have been charged to a domestic capital number and will be transferred to a Major Capital Item pending approval of this CPJ. This work will continue and be completed with the global objective of returning all equipment to service for safe and reliable operation.

JUSTIFICATION—BUSINESS CASE ANALYSIS (SUMMARY):

Justification and Link to Corporate/Business Unit Goals

Returning Jenpeg Unit 4 to service will return 31.1 MVA to Manitoba Hydro's bulk electric system. Approximately 28 MW would be available for export and domestic load. In order to return the unit to service, the restoring rod must be refurbished. The outage costs are estimated to be \$11,000 per day (~\$4.0 M per year).

2014/15 & 2015/16 Electric General Rate Application
JUSTIFICATION—BUSINESS CASE ANALYSIS (SUMMARY):

Justification and Link to Corporate/Business Unit Goals

The inspections will be a capitalized expenditure as they meet the following anticipated IFRS guidelines:

- Occur at least once over the life of the asset (At least three years apart);
- Are completed within an 18 month time period;
- Cost incurred are greater than \$500,000
- Are engaged to ensure that componentized assets meet their estimated useful lives

The project supports the following corporate goals:

- Provide a reliable and dependable supply of power to meet all customers' requirements - *continuously improve generating station reliability and capability as required to optimize operations of the system*
- Optimize operations, exports and development to minimize net cost to Manitoba customers - *Reduce duration of outages*

ANALYSIS OF ALTERNATIVES:

Economic Analysis

Discount Rate	For current corporate rates see G911 5.4%	For clarification on hurdle rates, contact the Economic Analysis Department
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Recommended Option

NPV Benefits (Costs)

Refurbish the Jenpeg Unit 4 restoring rod, perform a mechanical condition assessment of high risk components and return the Unit to service.

Other Alternatives Considered

NPV Benefits/(Costs)

Consideration was given to completing the repair only and not the condition assessments, thereby reducing the total project cost by \$2M. However, this was not recommended by Generation South as the Condition Assessment information is critical to Generation Operations Asset Management Program, to minimize the risk of future failures of Jenpeg Units and to help set the scope and schedule for the Jenpeg overhaul program which is currently estimated to be near \$100M.

Risk Analysis

Scope creep:

From a mechanical perspective, there are condition assessment activities to be done. As with all major work, disassembling a 35 year old machine may reveal damage or deterioration that must be fixed in order for the unit to be put safely back in service.

An internal Scope Change Request process, with formal approval signoff cycle, is currently in place to mitigate and maintain the risk of adding unnecessary or low-priority work to the project.

Capital budget constraint: The availability of capital funding is limited for the next few years. The overall Generation Operations capital budget will need to be managed to ensure higher priority jobs are completed first. It is expected that because this unit has failed that it will be included in the recommended portfolio.

Availability of internal resources: Internal resources for Project Management and design review for out of scope items must be secured and made available in a timely manner. Impact of not securing internal resources will be schedule delays. Staff turnover will have to be managed to ensure it does not significantly impact the course of this project work. Site resources will be used for some condition assessments and will be required for commissioning. These resources are limited and add risk to the project.

Competing projects: There may be crane conflicts between Jenpeg Unit 1 Fire Restoration and Jenpeg unit 4 Partial Mechanical Overhaul projects which could affect schedule. Jenpeg Shaft seal replacement project is underway and nearing completion; some work will overlap with Jenpeg Unit 4 repair work. Other major projects are scheduled to begin this year and include: Great Falls U4 Rerunning, Grand Rapids U1 exciter replacement, Pine Falls U2 rewind.

Accommodations: Accommodations are limited at Jenpeg and the Jenpeg Camp expansion project will not be completed until Fall 2014. Accommodations will have to be carefully coordinated for all Jenpeg projects.

Environmental: Workplace health and safety regulations and guidelines must be met during project. Lead is known element used throughout Jenpeg construction. Lead handling and dust abatement in addition to lead disposal must be addressed and each comes with added cost to the project.

2014/15 & 2015/16 Electric General Rate Application

Capital Budget Estimate

The annual net budget requirements are as follows (in thousands of dollars). The Domestic Capital actual cost to date is \$1,917,237 which is included in the 2013/2014 estimate below:

Prev. Actuals	\$	1,917
Over/Under Expend	\$	(275)
2014/15	\$	8,083
2015/16	\$	1,508
Total	\$	11,233

Proposed Schedule

ABCO contractor start date	Jan 21 2014
In Service Date	March 27, 2015

Related Projects

- Jenpeg Unit 4 Restoring Rod Replacement Project
- Jenpeg Unit 1 Fire restoration project
- Jenpeg Shaft Seal replacement project

Reference Documents

00198-41138 U4 Restoring Rod Failure EC recommendation 2012_02_10

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

GEN S ROOF REPLACEMENT PROGRAM

REVIEWED BY: (Owning Dept Manager)

M/S Rev 2014/05/30

NOTED BY: (if applicable)

Coordinating Division:

Constructing Division:

Financial Department: (if over \$1 million)

2014/06/05

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

2014/06/05

Business Unit V.P.:

2014/06/12

BUDGET \$: (Total Net Cost)	\$6,338,944
START DATE: (1 st Cost Flow)	2014 01
IN-SERVICE DATE: (Last Major In-service Date)	

OWNING DIVISION: G12500 / Generation South

I.M. NODE NUMBER: 1.1.1.3.13.1

W.B.S. NUMBERS: P21842

MAJOR ITEM DOMESTIC ITEM

PREPARED BY: TINHOLT, MIKE *h*

DATE PREPARED: 2014 05 14

REPORT NUMBER: 4298

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

<input checked="" type="checkbox"/> Safety	<input type="checkbox"/> Customer Service
<input type="checkbox"/> System Supply	<input type="checkbox"/> Efficiency
<input checked="" type="checkbox"/> System Reliability	<input type="checkbox"/> Environmental

NERC COMPLIANCE: YES NO

Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards

2014/15 & 2015/16 Electric General Rate Application
MANITOBA HYDRO
CAPITAL PROJECT JUSTIFICATION

Project Name

GEN S ROOF REPLACEMENT PROGRAM

Recommendation

Replace the roof elevations based on the recommendations provided by Pinchin Environmental in the roof inspection reports and the roofing condition assessments. Roofs to be replaced from worst case to best over the course of the next eight fiscal years at approximately one roof per year. All roof elevations will be replaced unless noted otherwise. These exceptions may include but not limited to roofing areas that are 15 years old or newer or have minimal signs of degradation.

Project Scope

Replace all roof systems in disrepair with new modern roof systems that will provide 30+ yrs of reliable service. This work will also include the removal of any and all redundant roofing structures or protrusions to prevent future leaks. Related items to include, but are not limited to: new pitch pans, flashings, roof drains/plumbing, scuppers, curbs, formed metal storm collars and all related sealing. This work includes all elevations at Jenpeg, Grand Rapids, and Bunker Bay 5 at Brandon GS.

Background

In 2011, Pinchin Environmental was contracted to inspect and determine the quality of the roofing systems throughout Generation South. Reports were generated by the consultant who described most roofs within Gen South as being Marginal to Poor and some had even failed. Some of our powerhouse roofs, although in reasonable condition, contain environmentally and structurally harmful roof construction such as phenolic foam insulation (acid leachate) and coal tar pitch (heavy petroleum product) that under certain conditions can be harmful to the building or its occupants.

The roofs were scaled on a weighted points system and given a score between zero and ten, zero being complete failure and ten being new condition. The draft outlook provides the schedule for repairs based on condition assessment scores provided by the consultant.

Jenpeg (proposed for 2015/16), has an average roof rating of poor (2.25). It has several roof areas that have standing water due to poor drainage and have resulted in widespread vegetation growth. Expansion joints and related metal coverings have deteriorated and showing signs of water damage. Water leaks into the Powerhouse have to potential to contact electrical equipment.

Grand Rapids (proposed for 2016/17) Powerhouse and Administration Building are in poor condition, 2.75 and 3.25 respectively. They have visible standing water on the membranes and between the vapour barrier and insulation. Vegetation growth can be widely seen on these two roof areas. No major maintenance has been done to the roof areas and repairs are needed to maintain service.

Brandon (proposed for 2017/18) has two elevations of concern: the admin wing (3.5 poor) and Bunker Bay 5 (1.5 failed). Both elevations have presence of ponding water within the roof membranes. The admin wing has a considerable amount of vegetation growth and shows signs of water leakage from underside of roof deck and is visible on the ceiling tiles. The powerhouse also has water infiltration through bunker bay 5 membranes evident by the staining on the roof deck, walls and floor.

2014/15 & 2015/16 Electric General Rate Application

Justification

Many of the roof systems within Gen South are beyond their service life and are experiencing major leaks and requiring constant repairs. In most cases the repairs performed are ineffective due to the condition of the overall roof areas and either the leaks continue despite the repairs, or the water finds another area to infiltrate. Many of the leaks are in critical areas of the powerhouses including high tension areas and control equipment. Failure to replace the roofs in a timely manner may result in a loss of generation due to electrical faults, mold growth within our powerhouses, increased deterioration of structural members, or personal injury due to slips, trips and falls.

Given the failing and near failure conditions the risk frequency is "High" while the consequence is considered as "Low" to "Medium" in the event of a electrical in our electrical equipment the over risk is rated as "Not Desirable" to "Unacceptable" on the risk matrix.

This project aligns with the Gen South and Power supply goals: "To provide reliable and dependable supply of power to meet all customers' requirements" and "Improve safety, health and wellness in the work environment".

ANALYSIS OF ALTERNATIVES:

Economic Analysis		
Discount Rate	For current corporate rates see G911 %	For clarification on hurdle rates, contact the Economic Analysis Department

Recommended Option	NPV Benefits/(Costs)
Recommend to proceed with the roof replacement program. "Do Nothing" was not considered a viable option as the roofs have exceeded their serviceable life and further deterioration could lead to unsafe working conditions and increased risk of damage to generating station assets.	

Other Alternatives Considered	NPV Benefits/(Costs)
"Do nothing" was not considered a valid option because the roofs have exceeded their serviceable lives.	

Risk Analysis
Scope Creep (High)
Schedule Delays (Medium)
Increase Costs (Medium)
Working at Heights (Low)
Environmental Impact (Low)

2014/15 & 2015/16 Electric General Rate Application

Capital Budget Estimate		
The annual net budget requirements are as follows (in thousands of dollars):		
Fiscal Year	Proposed Budget	
Prev. Actuals	\$	-
2014/15	\$	52
2015/16	\$	2,366
2016/17	\$	2,107
2017/18+	\$	1,814
Total	\$	6,339

Proposed Schedule
Station In-service dates: 2016/03/31 Jenpeg 2017/03/31 Grand Rapids 2018/03/31 Brandon

Related Projects
1991 - GS ROOF INSPECTION PROGRAM 4560 - GS FORECASTED ROOF REPLACEMENT PROGRAM 4577 - SF ROOF REPLACEMENT

Reference Documents
http://hrca.hydro.mb.ca/its/aip/Documents/Draft/4298 Gen South Roof Replacement Program APRIL 2014.docm CPJ April 2014
http://WPG-APPS-369/PROD/CopperLeaf5/docs/4298 Gen S Roof Replacement Program Addendum March 2014.docm CPJ March 2014
http://hrca.hydro.mb.ca/its/aip/Documents/Draft/4298 Gen S Roof Replacement 2013-14 CPJ.docm cpj
http://hrca.hydro.mb.ca/its/aip/Documents/Draft/4298 Gen S Roof Repl CPJ 13-14.docm 2013/14 CPJ
http://WPG-APPS-369/PROD/CopperLeaf5/docs/2/CPJ GEN S ROOF REPLACEMENT PROGRAM.docm
http://WPG-APPS-369/PROD/CopperLeaf5/docs/Draft CER.pdf
http://WPG-APPS-369/PROD/CopperLeaf5/docs/Slave Falls GS Roof Ratings.pdf
http://WPG-APPS-369/PROD/CopperLeaf5/docs/Manitoba Hydro Roof Rating Guide.pdf
http://WPG-APPS-369/PROD/CopperLeaf5/docs/Jenpeg GS Roof Ratings.pdf

36

COALITION/MH-I-81(a)

Capital Project Certification

Page 5 of 5

2014/15 & 2015/16 Electric General Rate Application

CAPITAL PROJECT JUSTIFICATION FOR

KETTLE GS PETROLEUM STORAGE FACILITY

REVIEWED BY:
(Owning Dept Manager)

NOTED BY:
(if applicable)

Coordinating Division: *H. AP*

Constructing Division: *John Koehn P. Eng. 2/14/02/27*

Financial Department:
(if over \$1 million) *Batolmi 2014-02-27*

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager: *[Signature]*

FOR F. MACINNIS.
Business Unit V.P.: *[Signature]*

2014-03-02

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- | | |
|--|---|
| <input type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input checked="" type="checkbox"/> System Reliability | <input checked="" type="checkbox"/> Environmental |

BUDGET \$: (Total Net Cost)	\$5,043,000
START DATE: (1 st Cost Flow)	2014 04
IN-SERVICE DATE: (Last Major In-service Date)	2014 12
RISK MATRIX/ BUSINESS CASE TIER: (Optional)	
INVESTMENT REASONS: (Optional)	

OWNING DIVISION: Generation North

LM. NODE NUMBER: 1.1.1.3.14.1

W.B.S. NUMBERS: ~~P:21919~~ P:16830

MAJOR ITEM **DOMESTIC ITEM**

PREPARED BY: Allan Desserre, P.Eng.
[Signature]

DATE PREPARED: 2013 11 25

REPORT NUMBER: 4554

FILE NUMBER (Optional):

NERC COMPLIANCE*: YES NO

*Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.

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38

2014/15 & 2015/16 Electric General Rate Application

Financial Planning

CAPITAL PROJECT JUSTIFICATION
FOR

Grand Rapids Hatchery Upgrade and Expansion

REVIEWED BY:
Angie Adams, New Generation Construction

NOTED BY:
(if applicable)

Coordinating Division:

Constructing Division:

Financial Department:
(if over \$1 million)

Angie Adams 10/10/14

RECOMMENDED FOR IMPLEMENTATION:

Owning Div. Manager:

A. Adams 2014/10/07

Business Unit V.P.:

Ben A. Barrett 7 Oct 2014

BUDGET \$: (Total Net Cost)	\$23,509,497
START DATE: (1 st Cost Flow)	2013 05
IN-SERVICE DATE: (Last Major In-service Date)	2018 03
RISK MATRIX/ BUSINESS CASE TIER: (Optional)	
INVESTMENT REASONS: (Optional)	

OWNING DIVISION:

I.M. NODE NUMBER: 1.5.1.6.4

W.B.S. NUMBERS: P:21656

MAJOR ITEM

DOMESTIC ITEM

PREPARED BY:

A.R. Adams

DATE PREPARED:

2014-10-07

REPORT NUMBER:

FILE NUMBER (Optional):

PRIMARY JUSTIFICATION:
Indicate key project driver(s):

- | | |
|---|---|
| <input type="checkbox"/> Safety | <input type="checkbox"/> Customer Service |
| <input type="checkbox"/> System Supply | <input type="checkbox"/> Efficiency |
| <input type="checkbox"/> System Reliability | <input checked="" type="checkbox"/> Environmental |

NERC COMPLIANCE*: YES NO

*Determine if the project requires compliance with North American Electric Reliability Corporation (NERC) CIP Cyber Security Standards.