

**Project Change Notice**

**Section 1: Request for Proposed Change**

<b>Title:</b>	Change to Diversion Timeline at MF and Overall Schedule Change for MF Project	<b>Date Originated</b>	7 Mar 2013
<b>PCN No.</b>	PCN-0137	<b>Originator</b>	Tony Scott
<b>DAN X-Ref.</b>	DAN-0349	<b>Package Leader / Engineer</b>	Laird Paton
<b>Origin</b>		<b>Area Manager</b>	Luc Turcotte
<input checked="" type="checkbox"/> Internal PMT	<input type="checkbox"/> Contractor/Supplier	<b>Scope Project Manager</b>	Scott O'Brien
<input type="checkbox"/> Other Nalcor	<input type="checkbox"/> Construction Site Event	<b>Current Status</b>	Submitted
<input type="checkbox"/> EPCM Consultant	<input type="checkbox"/> Other External <input type="text"/>	<b>Agreement / CP No.</b>	CH0006, CH0007, CH0008, CH0032
		<b>Revision</b>	0

**Description**

At DG3 baseline, diversion of the river was planned for 2015. For a variety of reasons resulting from the planned sanction decision, including but not limited to delays in starting site works, design changes (including to the Spillway), delays in contracting of CH0007 (Main Civil) and CH0032 (hydromechanical, especially Spillway), and delays and changes in the North Spur stabiliation works (CH0008) excessive schedule stress was placed upon the ability to meet this diversion timeline.

This was further highlighted in questions and letters received from the bidders that were preparing their bid for CH0007 (Main Civil Structures), which seemed to indicate significant cost premiums would be incurred trying to make the diversion timeline.

It is proposed to move river diversion to 2016, but still maintain power in 2017.

**Rationale**

Without changes to the timeline for the CH0007 works, the CH0007 bidders would very likely submit bids that included significant risk mitigation allowances (which would be hidden to the PMT) in order to cover their exposure to liquidated damages for missing the spillway & associated structures ready for diversion milestone. There were also clear indications that the bidders were uncomfortable with the execution and financial risks associated with the CH0007 contract package, and that some bidders may decline to bid. This would decrease the likelihood of receiving competitive bids that were in line with the project estimate. Such events would also increase the risk of a bid evaluation taking longer than planned. This, when coupled with the recognized already tight execution schedule (to diversion), clearly indicated a very high risk of not meeting the beginning of the 2015 diversion window (July to mid-October). If the front of this execution window were missed, the risk of missing closing the upstream cofferdam and diverting the river would increase dramatically. Such a delay would have far reaching consequences, including an unanticipated delay to power generation, as well as significant delays claims from multiple contractors.

Delaying diversion at this point recognizes the risks, and mitigates many of them, by significantly enhancing the ability of the CH0007 contractor to construct the facilities required for diversion within the revised timeline. This provides an opportunity for a an improved bid, reduction in contractor interfaces (changing execution strategies to remove the number), and a reclaiming of schedule float for the project related to the risky diversion operation, as well as a greatly increased likelihood of project success.

The attached presentation was prepared for management to address current situation, proposed situation, and carry-on effects of the change

**Benefits**

A delay of diversion from 2015 to 2016 will greatly reduce the risk of missing the diversion window. Diversion is directly impacted by works in the spillway (CH0006, CH0007 & CH0032) as well as (to a slightly lesser extent) North Spur works (CH0008). Changing the diversion year increases the likelihood of starting diversion at the beginning of the available window due to decreased likelihood of one of the preceding works slipping schedule and causing widespread delay.

**Section 2: Impact of the Proposed Change to Project**

**Categorization**

Scope Addition/Deletion

Scope Modification

Non-Scope Change

**Affected Project Component**

Muskrat Falls Generation

Labrador Transmission Assets

Labrador - Island Tx Link

Maritime Link

Nalcor PM

Other

Estimated Cost

Cost Control Account

**Direct and Indirect Impact by Change Analysis Team**

Basis of Design

Design Philosophy

Execution Approach

The inter-package relationships, primarily between CH0007 (civil works) and CH0032 (Hydro-Mechanical) can be adjusted to decrease the number of interfaces in the spillway construction by utilizing the changed schedule to modify the handover of the spillway from CH0007 to CH0032 to be for the entire spillway structure, rather than the bay-by-bay approach which was previously necessary. The bay-by-bay approach is common, but increases area congestion, requires greater coordination and increases the risk of delay claims. This change mitigates this.

Health & Safety

Environment and Regulatory Comp.

This change provides more time for the design and execution of the habitat compensation works, and the reservoir clearing works. With this change, reservoir impoundment would move from mid to late 2017.

Quality

Cost Control

Reviewed By *Craig Cleghat*

Date Reviewed: *25-March-2013*

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This change will impact (increase) project carrying costs (overhead, IDC, staff). It also may impact upon non-project costs such as extended operational and maintenance costs for the Holyrood generation plant. There will also be costs due to claims from the CH0030 (Turbines) supplier due to changing the installation schedule for the turbines.

However, the likelihood for unexpected and emergent cost increases through schedule extension and contractor claims associated with missing the 2015 diversion window is significantly reduced. Additionally, the likelihood of higher than estimated bids from the CH007 bidders is reduced.

The potential cost impact of the change is estimated as follows:

- CH0007 indirects (refer to attached worksheet): \$20.8M
- Various service packages (refer to attached e-mail): \$7M
- Changes to CH0030 (T/G) Contract: \$2M (verbal estimate from CH0030 package leader)
- non-project costs related to Holyrood plant operations: \$?M
- Project Management Team extended overheads and indirects: \$?M
- Total: \$29.8M + PMT overheads & non-project costs

Overall cost probably within the \$50M range *(includes PMT & non-project costs)*

**Schedule** Reviewed By *[Signature]* Date Reviewed: *25 MAR 13*

The schedule is impacted by moving diversion twelve (12) months. By doing this there is an impact upon the generation of power. The shift in power generation is in the order of a six (6) month delay. This utilizes the non-project natural schedule reserve that existed in the relationship between the MF project completion timeline for power generation (mid 2017) and the requirement for power generation to supply the island demand for the 2017/18 Winter. Note that the approval of PCN-109 (North Dam design change) is required to meet the revised overall MF schedule for power generation, and further optimization should be investigated for the upstream cofferdam and the North Dam.

Additionally, this change provides some buffer in the event of delays to the CH0006 bulk excavation works. Without this change, a delay to the bulk excavation works translates directly into the construction works that follow.

It is not suggested that the North Spur stabilization works timeline be significantly changed as a result of this PCN.

**Reputation**

Without this change the likelihood of missing diversion is rather high, and this would have a negative impact upon the reputation of the project within the province and the industry, as well as upon the financing community. By making this change, it is much more likely that diversion can be met.

**Contracts/Procurement**

Changes are required (via addenda) to the bidders of packages CH0007 (Main Civil) & CH0032 (HydroMechanical) to notify them of the change. A contractual change is required for CH0030 (Turbines) to notify them of the changed installation timeline. This contract may need to be further modified after awarding the CH0007 contract to reflect the baseline schedule for that package. There may be changes to the award timeline for the CH0008 (North Spur) and CH0009 (Dams) contracts, if deemed strategically necessary, to optimize the float that will become available from implementation of this PCN.

**Operations/Reliability**

**Property and Lands**

**Construction**

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This PCN alters the construction timeline and sequencing, but should enhance the construction works, by allowing for a levelling of resources within several packages, primarily CH0007. This will help with improved utilization of laydown areas, and leveling of the resources at the MF site, helping with camp loading.



### Other

A rough costing of this change is noted above but is probably in the order of \$50M, and includes both direct and indirect project costs, as well as direct and indirect non-project costs related to Holyrood operations. It is viewed, however, that this is affected by significant construction risk premiums from the main civil contractor (CH0007) should the original timelines be maintained.

The CCB have recommended to the Gatekeeper that PCN be approved thus allowing the schedule change to take place, however no contingency funds will be put aside for the PCN at this time, pending outcome of CH0007 award recommendation.



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Section 3: Risk Screening

NA: <input type="checkbox"/>	<b>Low</b>	<b>Medium</b>	<b>High</b>
<b>Risk Pre-Change</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>With Proposed Change</b>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Comments

**Pre-change:** Increasing risk of missing diversion timeline. If diversion timeline is missed, there would be a corresponding unplanned delay effect upon first power, which would likely result in extensive measures being taken at last minute leading to high mitigation costs. Furthermore, a delay of diversion would very likely lead to delay claims by many contractors.

**Post-Change:** Risk still exists with river diversion; it is the riskiest operation of the MF Project and is part of the critical path, so delay risk cannot be completely eliminated. However, delaying diversion by one season (one year) adds float to preceding operations, and allows preceding operations to be planned in a more optimal manner, further reducing the risks of delay

Verification

*There is also an added reputational opportunity in being able to state that the critical activity of diverting the River was performed according to plan.*

*[Signature]*

\* Reference Project Risk Management Plan for risk screening guidelines.

Risk Pre-Change							< 0.1% Rare (1)	0.1% - 1% Low (2)	1% - 5% Possible (3)	50% - 90% Likely (4)	> 90% Almost Certain (5)
	Capital Cost, \$M	Schedule, Mos	Product Quality	People (HS)	Env	Reputation					
Extreme (5)	> 100	> 12	System & safety requirements are not achieved	Single or multiple fatalities	Massive Effect	International media coverage. Irreparable stakeholder impact	5	10	15	20	25
Major (4)	10 - 100	3 - 12	Substantial effect on performance objectives	Serious personal injury resulting in permanent disability	Major Effect	National media coverage. Substantial stakeholder impact	4	8	12	16	20
Moderate (3)	1 - 10	1 - 3	All design and operating margins eliminated	Injury to personnel not resulting in permanent disability	Localized Effect	Regional media coverage. Moderate stakeholder impact	3	6	9	12	15
Minor (2)	0.1 - 1	0.25 - 1	Minor decrease in system performance	Medical treatment of personnel. Lost time incident	Minor Effect	Local media attention. Minor stakeholder impact	2	4	6	12	15

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Slight (1)	< 0.1	< 0.25	Slight degradation of element performance	Minor impact on personnel. First aid only. No lost time	Slight Effect	Slight media attention. Little stakeholder Impact	1	2	3	4	5
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Project Change Notice

**With Proposed Change**

	Capital Cost, \$M	Schedule, Mos	Product Quality	People (HS)	Env	Reputation	< 0.1% Rare (1)	0.1% - 1% Low (2)	1% - 5% Possible (3)	50% - 90% Likely (4)	> 90% Almost Certain (5)
Extreme (5)	> 100	> 12	System & safety requirements are not achieved	Single or multiple fatalities	Massive Effect	International media coverage. Irreparable stakeholder impact	5	10	15	20	25
Major (4)	10 - 100	3 - 12	Substantial effect on performance objectives	Serious personal injury resulting in permanent disability	Major Effect	National media coverage. Substantial stakeholder impact	4	8	12	16	20
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Minor (2)	0.1 - 1	0.25 - 1	Minor decrease in system performance	Medical treatment of personnel. Lost time incident	Minor Effect	Local media attention. Minor stakeholder impact	2	4	6	12	15
Slight (1)	< 0.1	< 0.25	Slight degradation of element performance	Minor impact on personnel. First aid only. No lost time	Slight Effect	Slight media attention. Little stakeholder impact	1	2	3	4	5

**Section 4: Implementation Plan**

**General Actions**



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**Actions**

Action	Actionee	Status
Issue RFP addendum to CH007 contractor with changed timeline	Adamcyk, Ron	Incomplete
Issue RFP addendum to CH0032 bidders notifying of changed schedule	Over, Ed	Incomplete
Facilitate approval of PCN-0109 regarding North Dam design	O'Brien, Scott	Incomplete
Revise/Re-issue LCP Management Summary Schedule	Chudy, Tom	Incomplete
Update (Nalcor) Integrated Project Schedule (IPS)	Chudy, Tom	Incomplete
Revise contract with CH0030 to account for schedule changes	Woodmass, Chris	Incomplete
Reassess cost impact of PCN following receipt of recommendation for CH0007 award	Chehab, Georges	Incomplete
Communicate changes to financial group	Clarke, Lance	Incomplete
Communicate changed timeline for power delivery from MF to System Planning/Operations	O'Brien, Scott	Incomplete
Revise/Reissue LCP Target Milestone Schedule	Scott, Tony	Incomplete
Update (SLI) Project Control Schedule (PCS)	Zylber, Marvin	Incomplete

**Documents**

Name	File Name
Indirect cost impacts to CH0007	PCN 137 impact on CH0007 indirects.pdf
Impacts of changes - CH0007	PCN0137 backup.ppt
Presentation of key date changes to corporate management	MF - Key Target Dates Revision PH - 2 feb-2013.pdf
Cost Impacts to PCN137	PCN137 cost impact e-mail.pdf

**SLI References**

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**Project Change Notice**

**Section 5: Distribution**

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| <input checked="" type="checkbox"/> Originator                     | <input type="checkbox"/> System Planning (Nalcor)  |
| <input type="checkbox"/> Package Leader/Engineer                   | <input type="checkbox"/> Operations                |
| <input checked="" type="checkbox"/> Area Manager                   | <input type="checkbox"/> MF Site Manager           |
| <input checked="" type="checkbox"/> PM - Muskrat Falls Generation  | <input type="checkbox"/> Construction Manager      |
| <input type="checkbox"/> PM - HVdc Specialties and Switchyards     | <input checked="" type="checkbox"/> Other          |
| <input type="checkbox"/> PM - Overland Transmission                | <input type="checkbox"/> GateKeeper                |
| <input checked="" type="checkbox"/> Project Controls Manager       | <input type="checkbox"/> Other                     |
| <input type="checkbox"/> Supply Chain Manager                      | <input type="checkbox"/> Other                     |
| <input type="checkbox"/> H&S Manager                               | <input type="checkbox"/> Other                     |
| <input type="checkbox"/> Quality Manager                           | <input type="checkbox"/> Other                     |
| <input checked="" type="checkbox"/> E&AA Manager                   |  |
| <input type="checkbox"/> Business Services Manager                 |  |
| <input type="checkbox"/> TDI/RFO Manager                           |  |
| <input checked="" type="checkbox"/> Deputy Project General Manager |  |
| <input type="checkbox"/> Marine Crossings Manager                  |  |
| <input checked="" type="checkbox"/> Project General Manager        |  |
| <input type="checkbox"/> Finance Manager                           |  |
| <input checked="" type="checkbox"/> Project Director               | <input checked="" type="checkbox"/> Vice President |

**Section 6: Acceptance Phase**

**Project Change Notice**

**Decision**

Approve       Reject/Cancel

Decision Date **23-Apr-2013**

**CHANGE CONTROL BOARD APPROVAL**

O'Brien, Scott  **05 Apr 2013**

Project Manager signature

\_\_\_\_\_

Nalcor System Planning signature

 **12 Apr 2013**

Project Controls Manager signature

\_\_\_\_\_

Operations Engineering Lead signature

 **25-Mar-13**

Supply Chain Manager signature

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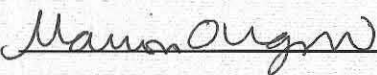
Other Approval

\_\_\_\_\_

H&S Manager signature

\_\_\_\_\_

Quality Manager signature

 **27-Mar-2013**

ES&A Manager signature  
ERC

\_\_\_\_\_

Business Services Manager signature

\_\_\_\_\_

Design and Integrity Manager signature

 **25-MAR-2013**

Deputy Project Manager signature

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Marine Crossings PM signature

 **05-APR-2013**

General Project Manager signature

\_\_\_\_\_

 **23 Apr 13**

V.P. - Lower Churchill Project signature

\_\_\_\_\_

General Manager Finance signature

 **5 APR 2013**

Project Director signature

\_\_\_\_\_

CEO & Gatekeeper signature

## Project Change Notice

### Section 7: Close-Out

Implementation Status Complete:

Signoff:

Change Coordinator:

Date:

Scope/Area Manager:

Date: