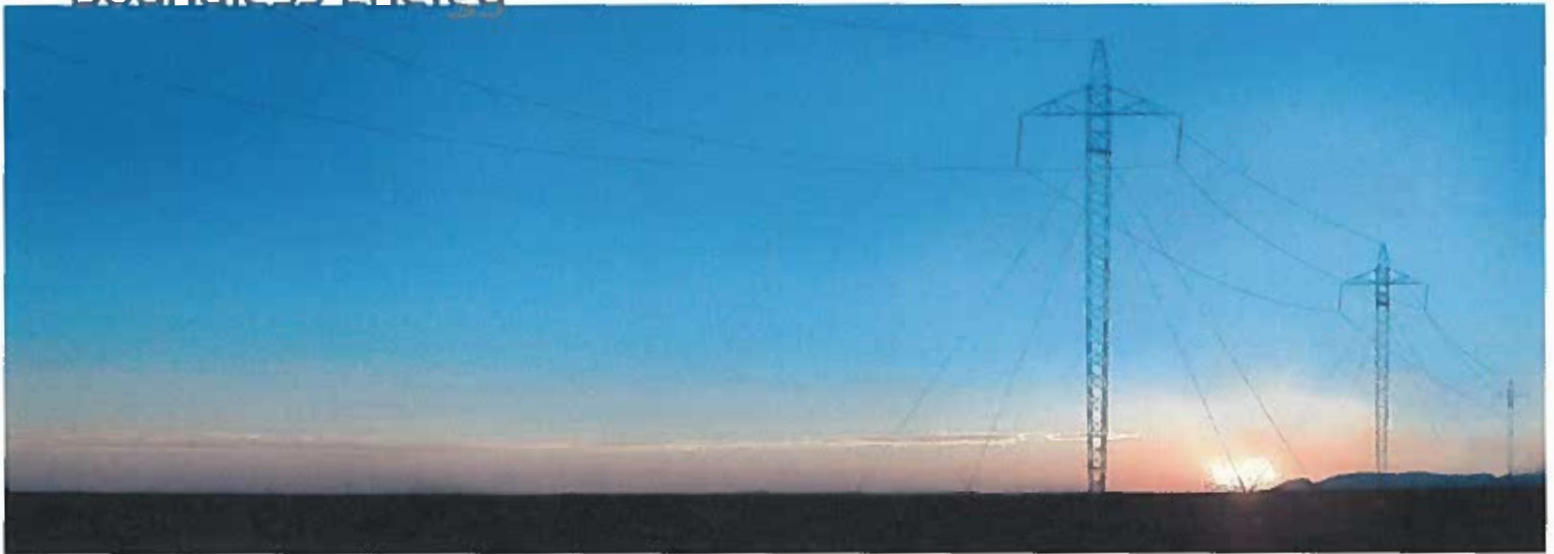


RP#12

Boundless Energy



Trip Evaluation Report

Contractor Project Site Visits

Related Package Number: CH0007

Package Title: Intake, Powerhouse, Spillway and Transition Dams



SNC • LAVALIN EPCM consultant for Nalcor



LOWER CHURCHILL PROJECT

TRIP EVALUATION REPORT

**CH0007- Intake, Powerhouse,
Spillway and Transition Dams**

	NAME	TITLE	SIGNATURE	DATE
PREPARED BY:	<i>Paton Laird</i> <i>McClintock Ken</i>	Construction Manager Consultant		



 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	 nalcor <i>energy</i>
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

TABLE OF CONTENTS

1.0 Purpose..... 2

2.0 Objectives..... 2

3.0 Evaluation Process and Focus Areas..... 2

4.0 List of Companies and Project Sites Reviewed..... 3

5.0 Schedule and Itinerary..... 4



6.0 Evaluation Team 4

7.0 Evaluation Criteria 5

8.0 Record of bservations..... 7

9.0 Conclusions and Recommendations..... 7

10.0 Appendices 13

 SNC · LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

1.0 PURPOSE

This document describes the purpose, focus areas and process, related to site visits of projects constructed by three of four construction companies bidding on Package CH0007 – Intake, Powerhouse, Spillway and Transition Dams.

In addition, this document records the travelling team's observations, conclusions and recommendations that are suggested for use in support of the bid evaluation process, for possible negotiations and for post award implementation.

2.0 OBJECTIVES

The objectives of the site visits were:



- a) To evaluate the **operations of the contractors on current projects** so as to provide a level of confidence that they could meet LCP requirements
- b) Provide feedback on contractor strengths and weaknesses to support bid evaluations and potential negotiations
- c) Gather information on construction techniques, execution and lessons learned for possible use on LCP

3.0 EVALUATION PROCESS AND FOCUS AREAS

The evaluation process was initiated following requests to three of four companies bidding on CH0007 to receive LCP representatives for the purpose of reviewing their operations on existing projects (see Appendix 6 for project options offered by two of the companies visited). One of the qualified bidders, IKC, was not initially included in the reviews as they were currently working on LCP and were believed to be a know entity. Following the return of the review team, however, they were requested to include IKC in the evaluation. Accordingly, this report has been updated to include a desktop evaluation based on knowledge of IKC One and an IKC One project presentation of their Smokey Falls (Lower Mattagami) project

It was targeted to complete the site visits prior to receiving the completed bids from the companies.

All companies had previously been selected following a prequalification process. They were, therefore, expected to have already met evaluation criteria for capability, experience and

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

financial strength. Accordingly, areas of focus were selected to evaluate the companies in areas which could not have been assessed in a normal prequalification process.

The following focus areas were selected for the reviews.

- 1) Health, Safety and Environmental (HS&E)
- 2) Systems Availability and Implementation
- 3) Construction Methods and Quality
- 4) Planning and Execution

Additional background on specific evaluation criteria considered is included in Section 7 below.

4.0 LIST OF COMPANIES AND PROJECT SITES REVIEWED



This report included visits to projects constructed by the following companies:

- AECON (Canadian)
- Salini (Italian) including IMPREGILO (Italian) which was recently acquired by Salini
- ASTALDI (Italian)

As identified above, Salini recently acquired IMPREGILO, another large and successful Italian construction company. For the purposes of this report, however, and as Salini is the bidding entity related to CH0007, any conclusions or recommendations related to IMPREGILO will be expressed as Salini

The project sites visited, by company, and current status, are included below. Details on these projects are provided in the Appendix:

Company	Project Name	Location	Status	Remarks
<i>AECON</i>	<ul style="list-style-type: none"> • <i>Waneta Hydroelectric Expansion</i> 	BC, Canada	Under Construction	335 MW, twin Francis Turbines
<i>Salini</i>	<ul style="list-style-type: none"> • <i>Copenhagen Metro Extension</i> • <i>Sogamoso Hydro Project</i> 	Denmark Colombia	Under Construction Under Construction	821 MW, 3 Francis Turbines

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

<i>ASTALDI</i>	• Chuquicamata Mine	Chile	Under Construction	111 MW Francis 90 MW 2 Pelton 510 MW 3 Francis
	• Chacayes Hydro project	Chile	Complete	
	• Huanza Hydro project	Peru	Under Construction	
	• Cerro Del Aguila Hydro Project (Presentation only)	Peru	Under Construction	

5.0 SCHEDULE AND ITINERARY



The site visits took place between March 24 and April 14, 2013. A copy of the team's travel itinerary is provided in Appendix 1.

Hotch Potch. Owners eng.?

6.0 EVALUATION TEAM

The evaluation team consisted of Messrs. Laird Paton and Ken McClintock. Only Mr. Patton was available for the visit to the AECON project site. Where reviews were conducted together, both representatives provided their evaluations on the focus areas reviewed. Focus area responsibility, however, by team member, was as follows

Focus Area	Prime Responsibility/Sub
HS&E	Paton
Systems	McClintock/Paton
Construction	Paton/McClintock
Execution & Planning	McClintock/Paton

 SNC · LAVALIN	Trip Evaluation Report	Rev. No.	Date	 nalcor <i>energy</i>
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

7.0 EVALUATION CRITERIA

For each Focus Area, the team considered, where appropriate and possible, the following evaluation criteria:



HS&E

- Site safety statistics
- Lagging and leading indicator documentation
- Contract/Project Risk Register
- Sample Critical Lift Plan
- Step Back/Take 5/Tailgate meeting sample documentation
- Sample safety Dashboards
- Hazardous Materials Register
- Tool/Equipment registers
- HS training registers
- Site safety Inspection Checklists
- Sample Health and Safety Committee Minutes
- Confined Space register
- Vehicle inspection reports (daily/monthly/annual)

Systems Availability and Implementation

- Computerized Control Systems for Planning, Construction, Document Control, Cost, Procurement and Administration
- Progress and performance measurement systems
- Scheduling including Critical Path and Float analysis



Construction Methods and Quality

 SNC · LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

- Site layout Drawings
- Work method statements
- Concrete test results and statistics
- Concrete pour drawings showing finish/embeds/waterstops etc
- Sample Pour Approval sheet and checklist
- Inspection and Test Plans
- General quality management including quality audits and calibration reports
- Non Conformance management

General Planning & Execution

- Execution planning process/Execution Plan
- Overall scheduling methodology
- Contract (commercial) overview/compensation/risk/interface with client/scope of work
- Impacts of working in another country/actions taken to overcome
- Labour situation/agreements/management responsibility/actions taken to create good workir
- Organizational structure/authorities/key personnel/reporting hierarchy/corporate oversight
- Procedures/processes (wrt engineering/procurement/construction/client & other interfaces/regulatory/internal/administration
- Interface with regulatory/permitting entities
- Progress reporting/copy of weekly/monthly reports
- Document Control
- Completions/Commissioning/Handover
- Interface Management
- Material delivery management
- How well each of the contractor's set-up their respective sites to achieve maximum productivi
- What productivity improvement practices are the contractors using the site?
- How do they use sub-contractors - what areas?
- What portion of the site management team are core to the firm, vs local hires?
- H&S - what metrics are used and what are the statistics for the sites?
- Experience working with unskilled and semi-skilled labour from aboriginal groups - is this bein utilized?

 SNC-LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

- What facilities do they have in place to support the site management team - offices, infrastructure?
- What is the rotation for site management team?
- What is the relationship with the Engineer on the site?
- Is there a third party resident engineer or other?
- What owner presence is on site? Are they comfortable/familiar with interfacing with the owner at the work site?

8.0 RECORD OF OBSERVATIONS



The detailed notes and observations of the review team are included in Appendix 5.

9.0 CONCLUSIONS AND RECOMMENDATIONS



The review team has summarized their impressions about the contractors in the following Table of Conclusions. Based on these impressions, a set of recommendations related to each contractor has been developed for use in support of the bid evaluation process, for possible negotiations and for post award implementation.

9.1 CONCLUSIONS



Company	Conclusions	Remarks
AECON	<ol style="list-style-type: none"> 1. <i>Aecon</i> is a solid construction contractor with demonstrated capability in hydroelectric developments. 2. In general, HSE systems are good but not outstanding. HSE risk register not properly populated and not used 3. Excellent progress monitoring system in place. Earned value management (EVM) well understood, up to date and used 4. Manhours used as base of EVM 5. Excellent tools in place to plan concrete pours 6. Extensive site produced work method statements and concrete pour 	

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

	<p>drawings reduce possibility of mistakes and/or omissions</p> <p>7. No overall contract execution plan used at Waneta not necessarily corporate policy.</p> <p>8. Interface management not understood on the project visited.</p> <p>9. Document control not sophisticated but adequate for the job</p>	
<i>Salini</i>	<ol style="list-style-type: none"> 1. Salini is a world class construction contractor with demonstrated capability in hydroelectric developments. Taking on risk is commonplace. Salini undertakes projects all over the world and on these visits demonstrated that it knows what is required to work in another country, including adjustment to language, culture, labour and local sensitivities. 2. Salini possesses all required safety systems and procedures but does not demonstrate the implementation of a safety culture to the level required by LCP 3. Demonstrated ability to work with sophisticated and involved clients. Very client focused. 4. Do not have a "claims" mentality but process claims fairly 5. Most projects require Salini to work directly with unions. They are well aware of productivity impacts and take steps to stabilize workforce. Not a fan of financial incentives for productivity increases 6. Very good planning and scheduling processes. Team "uses" the schedule. All progress measured appropriately in quantities, but rolled up in \$ value. 7. Risk assessment processes weak. Salini now starting to implement risk management more formally within the company/projects. 8. Strong support from head office at project start-up and throughout execution 9. Strong internal reporting and corporate oversight 10. Document control processes are mixed. Accustomed to working with Aconex type systems. 11. Excellent HSE leading indicating register, plan and follow up statistics 12. Excellent Construction Work Method Statements 13. Extremely detailed Concrete pour drawings 	

 SNC-LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

ASTALDI	<ol style="list-style-type: none"> 1. Astaldi is a world class construction contractor with demonstrated capability in hydroelectric developments. Taking on risk is commonplace. Astaldi undertakes projects all over the world and on these visits demonstrated that it knows what is required to work in another country, including adjustment to language, culture, labour and local sensitivities. 2. Astaldi possesses all required safety systems and procedures but does not demonstrate the implementation of a safety culture to the level required by LCP, unless enforced by client. 3. Very strong relationship with client. Client obviously thinks highly of Astaldi competence 4. Demonstrated ability to install office in new country (Peru) and implement very serious projects (three hydro projects since opening office in 2009) 5. Demonstrates ability to work with sophisticated and involved clients. Very client focused. 6. Do not have a "claims" mentality but will process claims fairly. 7. Most projects require Astaldi to work directly with unions. They are well aware of productivity impacts and take steps to stabilize workforce. Training programs implemented where required. 8. Very good planning and scheduling processes. Team "uses" the schedule. All progress measured appropriately in quantities, but rolled up in \$ value. 9. Risk assessment processes weak. Astaldi now starting to implement risk management more formally within the company/projects. 10. Strong support from head office at project start-up and throughout execution 11. Strong internal reporting and corporate oversight 12. Document control processes are mixed. Excel appears as system of choice on project reviewed. 13. Detailed norms used for bidding. All mhrs available for earned value reporting 14. Good 4x4 HSE risk register 15. Line management heavily involved in HSE 16. High level in house concrete expertise 17. Evidence of regular Quality audits 	
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 SNC-LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

Conclusions IKC One

- 1 IKC One is a world class construction contractor with demonstrated capability in hydroelectric developments
- 2 IKC One possess all required safety systems and procedures and demonstrate the implementation of a safe culture however the safety results a Lower Mattagami do not reflect the strength of the systems in place at the safety culture that Kiewit is known to demonstrate
- 3 Most projects require IKC One to work directly with unions. They are well aware of productivity impacts and take steps to stabilize workforce. Training programs implemented where required.
4. Sophisticated quality monitoring system both on and off site
5. Excellent supplier management systems and adherence to same
6. Equipment registers and equipment maintenance practices well established and followed rigorously
7. Experience working with unskilled and semi-skilled labor from aboriginal groups and good training programs in place
- 8 Solid progress monitoring systems
- 9 Experienced teams having worked on several hydro projects together



Recommendations IKC One

1. A client lead safety culture must be developed, starting with negotiations and kick-off meetings and demonstrated every day of the contract. Contractor has all necessary support systems, but must be lead by example.
2. Safety record of other projects must be discussed and IKC One must indicate steps that they intend to implement in order not to repeat mistakes of the past
3. IKC One has a reputation for claims in some circles. What mutual steps would have to be taken to reduce the possibility of claims



 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

9.2 RECOMMENDATIONS

Company	Recommendations	Remarks
<i>AECON</i>	<ol style="list-style-type: none"> 1. There is no doubt that AECON has the strength, experience and capability to undertake CH0007. As with all such contracts, however, AECON’s proposed team and execution plan are fundamental to the successful completion of the work, and should be considered of prime importance in the evaluation. 2. A client lead safety culture must be developed, starting with negotiations and kick-off meetings and demonstrated every day of the contract. Contractor has all necessary support systems, but must be lead by example. 3. Work with AECON to develop risk assessment process acceptable to LCP 4. Ensure that a detailed, solid contract execution plan is produced 	
<i>Salini</i>	<ol style="list-style-type: none"> 1. There is no doubt that Salini has the strength, experience and capability to undertake CH0007. As with all such contracts, however, Salini’s proposed team and execution plan are fundamental to the successful completion of the work, and should be considered of prime importance in the evaluation. 2. A client lead safety culture must be developed, starting with negotiations and kick-off meetings and demonstrated every day of the contract. Contractor has all necessary support systems, but must be lead by example. 3. Be very clear about LCP requirements for measuring and reporting progress. Salini “rolls-up” progress based on money, which may be appropriate for CH0007. Have Salini fully explain its standard progress reporting system and be open and flexible on adopting it for the work. Get agreement at kick-off meeting on reporting frequency and levels of detail required. 	



 SNC-LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

	<p>4. Work with Salini to develop risk assessment process acceptable to LCP</p> <p>5. Ensure safety leadership plan put in place. Presently too much emphasis placed on checklists and not enough on observation</p> <p>6. Proper Critical lift plan procedure to be developed (use ours?)</p>	
<i>ASTALDI</i>	<p>1. There is no doubt that ASTALDI has the strength, experience and capability to undertake CH0007. As with all such contracts, however, ASTALDI's proposed team and execution plan are fundamental to the successful completion of the work, and should be considered of prime importance in the evaluation.</p> <p>2. A client lead safety culture must be developed, starting with negotiations and kick-off meetings and demonstrated every day of the contract. Contractor has all necessary support systems, but must be lead by example.</p> <p>3. Be very clear about LCP requirements for measuring and reporting progress. Astaldi "rolls-up" progress based on money, which may be appropriate for CH0007. Have Astaldi fully explain its standard progress reporting system and be open and flexible on adopting it for the work. Get agreement at kick-off meeting on reporting frequency and levels of detail required.</p> <p>4. Work with ASTALDI to develop risk assessment process acceptable to LCP</p> <p>5. Ensure HSE personnel proposed have good site experience and not just theoretical</p> <p>6. Get clarification on involvement of the Canadian entity that they have purchased. It does not have (to our knowledge) heavy civil experience</p>	

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	



10.0 APPENDICES

- Appendix 1 – Schedule and Itinerary
- Appendix 2 – Business Cards
- Appendix 3 – Salini Project Data
- Appendix 4 – Astaldi Project Data
- Appendix 5 – Team Notes
- Appendix 6 – Site Visit Options

 SNC-LAVALIN	Trip Evaluation Report	Rev. No.	Date	 nalcor <i>energy</i>
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	



APPENDIX 1

Schedule and Itinerary

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	



APPENDIX 2

Business Cards of Contacts

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	



APPENDIX 3

Salini Project Data

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	



APPENDIX 4

Astaldi Project Data

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	



APPENDIX 5

Team Notes

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	

APPENDIX 6

SITE VISIT OPTIONS (SALINI & ASTALDI)

 SNC • LAVALIN	Trip Evaluation Report	Rev. No.	Date	
	Related Package - CH0007 Intake, Powerhouse, Spillway and Transition Dams	00	14-APR-2013	