

CHO-010 Request for Compensation – May 16, 2017

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Andritz Hydro Canada Inc.

Meeting Agenda

- 1. General brief presentation regarding the situation
- 2. Andritz's planned execution conditions
- 3. Change Order 10 and directive to accelerate
- 4. Actual conditions
- 5. Site environment details
- 6. Impacts on the performance of the Work
- 7. Consequences of the changed conditions on Andritz's work
- 8. Consequences of the changed conditions on CRT's work
- 9. Consequences of the changed conditions on Iskueteu's work
- 10.Consequences of the changed conditions on Canmec's work
- 11.Results of Andritz acceleration effort
- 12. Summary and Conclusion



PLANNED AND ACTUAL CONDITIONS FOR THE PERFORMANCE OF THE WORK (SECTION 2)



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Andritz's planned execution conditions

The parameters according to which this plan was devised were:

- 1. Optimized execution strategy
- 2. Provision for reasonable schedule flexibility
- 3. No interference with Company's Civil Work Contractor
- 4. Limited quantity of work during winter
- 5. Spillway Work would be completed before River Diversion
- 6. Mitigation of Andritz's commercial risk
- 7. Balanced Decision Making Process based on cost and schedule benefits



Change Order 10

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On November 12, 2015, Company instructed Andritz to implement the following acceleration measures:

- 1. Increased staff, supervision, and indirect expenses;
- 2. Additional labour, including sub-contractor costs and overtime;
- 3. Additional small tools, PPE and consumables;
- 4. Additional equipment hours; and
- 5. Lost productivity due to winter working conditions and all other productivity impacts associated with the acceleration.



Actual execution conditions

Planned execution conditions:

- 1. Optimized execution strategy
- 2. Provision for reasonable schedule flexibility
- 3. No interference with Company's Civil Work Contractor
- 4. Limited quantity of work during winter
- 5. Spillway Work would be completed before River Diversion
- 6. Mitigation of Andritz's commercial risk
- 7. Balanced Decision Making Process based on cost and schedule benefits

Change Order 10 execution conditions:

- 1. Modified execution strategy
- 2. Elimination of most of the planned schedule flexibility
- 3. Interferences by Company's Civil Work Contractor
- 4. Increased quantity of work performed under winter conditions
- 5. River Diversion Window before the completion of the Spillway Work
- 6. Undermining of Andritz's commercial risk mitigation strategy
- 7. Decision Making Process mainly based on schedule benefits



- I1B
 - Completion of Northern 2 Monoliths of Center Transition Dam including the Electrical Building Platform;
 - Completion of Spillway piers and walls (downstream 1/3) including both Downstream Bridges and Access Ramp Retaining Wall;
 - Completion of North Transition Dam;

- Completion of Separation Wall;
- Completion of Spillway concrete Discharge Channel Phase 1;
- Spillway Discharge Channel free for CH0032 occupation.





What Company should have delivered on September 1st 2015 (Photo from July 2016)



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September 1st, 2015 0 of 6 conditions met



What Company should have delivered on September 1st 2015 (Photo from July 2016)



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- I1B
 - Completion of Northern 2 Monoliths of Center _____ Transition Dam including the Electrical Building Platform;
 - Completion of Spillway piers and walls (downstream 1/3) including both Downstream Bridges and Access Ramp Retaining Wall;
 - Completion of North Transition Dam;



September 1st, 2015 0 of 6 conditions met



June 5th, 2016 Civil Contractor presence continues

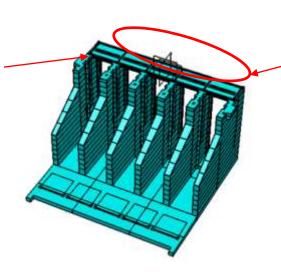
- Completion of Separation Wall;
- Completion of Spillway concrete Discharge Channel Phase 1;
- Spillway Discharge Channel free for CH0032 occupation.



What Company should have delivered on September 1st 2015 (Photo from July 2016) CORRELATION

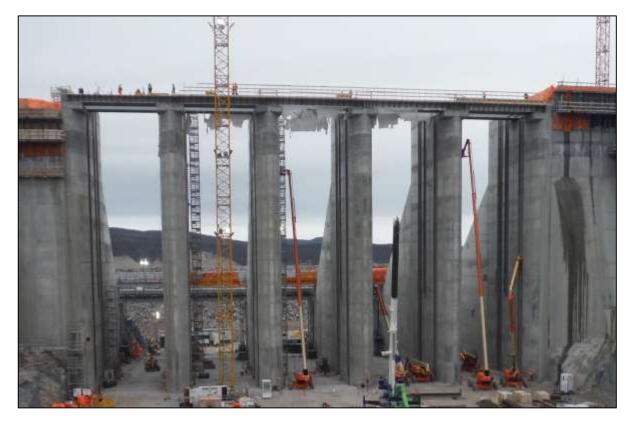


- I1A
 - Completion of Spillway piers and walls (upstream 2/3 portion only), including upstream bridge;
 - Completion of Spillway Invert;



Spillway Upstream Channel free for Hydro-Mechanical Contractor CH0032 occupation.





November 3rd 2015 0 of 3 conditions met

Picture not available

- As of October 31st 2016
- Upstream bridge only completed after River Diversion (TCM Rails)
- Other Contractor presence continuous during the execution period
- Water flowing through Spillway

What Company should have delivered on November 1st 2015



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I1A

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- Completion of Spillway piers and walls (upstream _ 2/3 portion only), including upstream bridge;
- Completion of Spillway Invert;



November 3rd 2015 0 of 3 conditions met



December 13th, 2015 Civil Contractor presence continues

Spillway Upstream Channel free for Hydro-Mechanical Contractor CH0032 occupation.

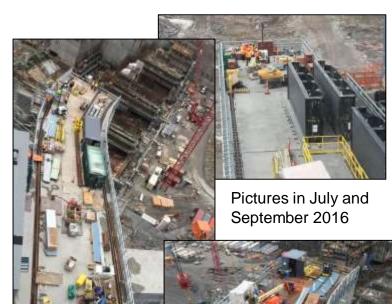
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What Company should have delivered on November 1st 2015

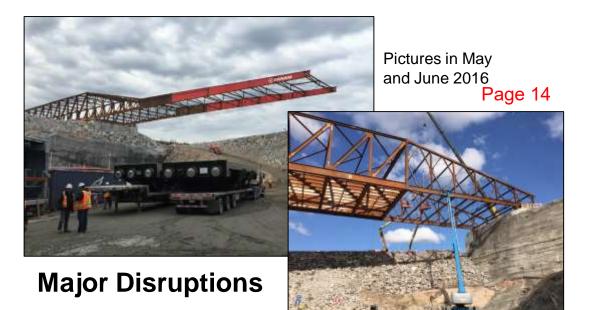


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Omnipresent Clutter

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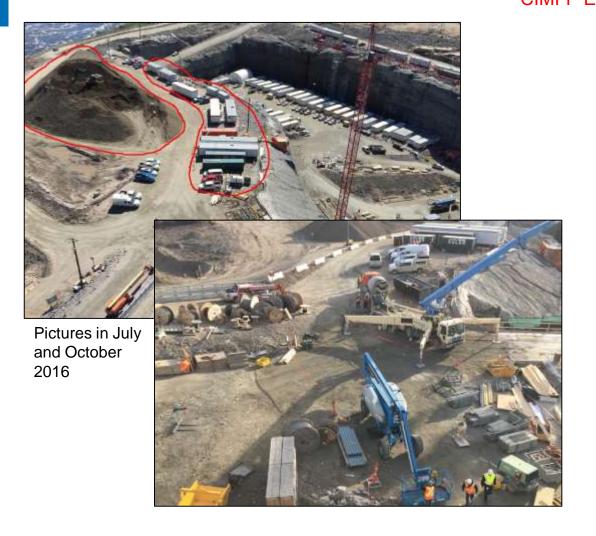


Bespoke Coordination Measures Picture in July 2016

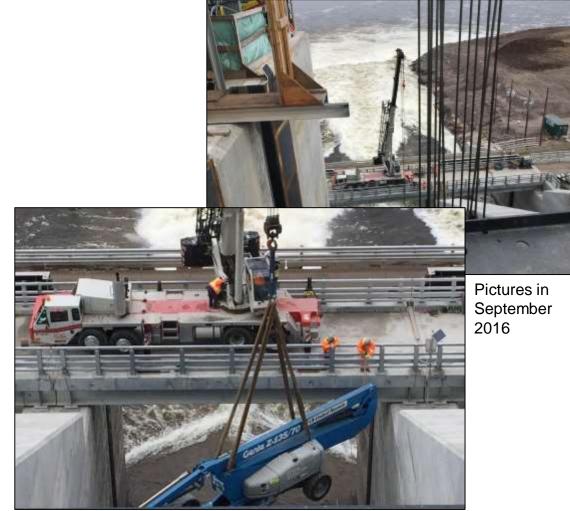


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Site Obstructions



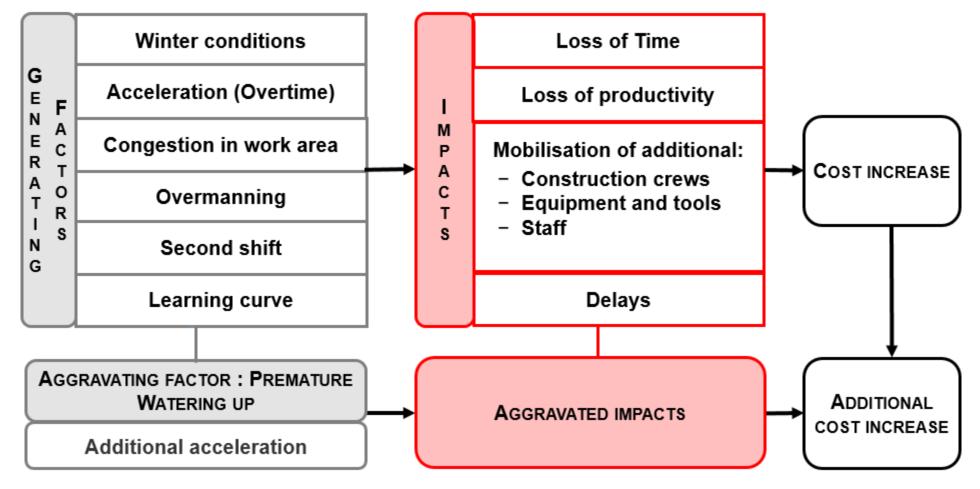
Work Above Water



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Impacts of the changed conditions on the CIMFP Exhibit P-02956 performance of the Work





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Specific Impacts on: Andritz's Work CRT's Work Iskueteu's Work Canmec's Work



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CONSEQUENCES OF THE CHANGED CONDITIONS ON ANDRITZ'S WORK (SECTION 6)



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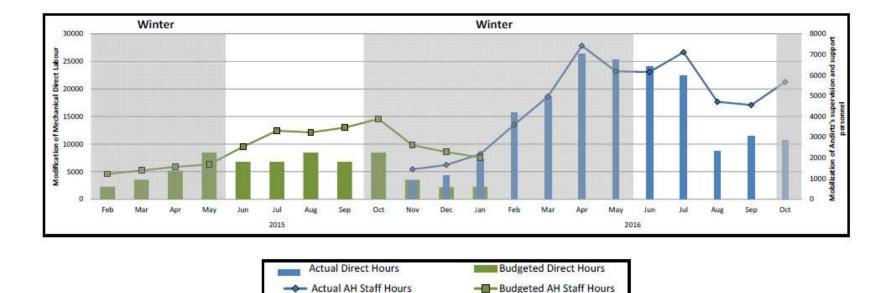
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- Mobilization of additional supervision and support personnel
- Performance of a significant portion of the work under winter conditions
- Mobilization of additional tools, equipment and manpower to support the execution of the work prior to River Diversion
- Premature watering up of the Spillway



Mobilization of additional supervision and support personnel:





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Performance of a significant portion of the work under winter conditions:

- Unplanned snow removal at and around CRT's work areas
- Loss of productivity for the construction crews



Mobilization of additional tools, equipment and manpower to support the

execution of the work prior to River Diversion:

- Temporary construction power in the Spillway;
- Temporary commissioning power;
- Snow removal;
- Temporary construction power for hydro-mobiles;
- Support for CRT's acceleration effort; and
- Vehicules.



Company's decision to prematurely water-up the Spillway:

- Mobilization of additional site supervision and support personnel
- Supply of temporary power to the Trash Rack Cleaning Machine (TCM)
- Idle time for Andritz's manpower and equipment
- Implementation of additional emergency procedures
- Additional work for the gates flashing installation
- Aggravation of the dogging device problem



Additional costs:

Total	\$6,275,075
Company's decision to prematurely water-up the Spillway	\$1,442,990
Mobilization of additional tools, equipment and manpower to support the execution of the execution of the work prior to River Diversion	\$1,774,629
Performance of a significant portion of the work under winter conditions	\$199,592
Mobilization of additional supervision and support personnel	\$2,857,864



Other costs:

 Financing (up to December 31, 2016)
 \$415,222

 Preparation of this request for compensation (up to December 31, 2016)
 \$116,838

 Total
 \$532,060



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CONSEQUENCES OF THE CHANGED CONDITIONS ON CRT'S WORK (SECTION 3)



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CRT's Scope of Work:

CRT had to perform the concreting and embedment of:

- The embedded parts and sill beams for:
 - The Spillway gate guides and seal faces;
 - The permanent stoplog guides and seal faces;
 - The temporary stoplog guides and seal faces;
 - The Powerhouse Intake Trash rack guides;
 - The Intake Bulkhead Gates guides and seal faces;
 - The Intake Gates guides and seal faces; and
 - The Draft Tube Stoplogs guides and seal faces.
- The steel rollway liners with anchors in the final rollways, downstream of each Spillway gate;

- Performance of a significant portion of the concreting activities under the more severe winter conditions that prevail in the Labrador region, from the fall of one year to the spring of the following year;
- Reduction of CRT's schedule for the upstream work;
- Additional reduction of CRT's schedule for the upstream work, at Bays 3, 4 and 5;
- Training of workers to use scissor-lifts instead of hydro-mobiles on the downstream side.



Winter Work:

- Construction of a temporary shelter for the transfer of concrete between the concrete mixer truck ("CMT") and the concrete lifting buckets ("CLB");
- Modification to the planned concreting work method for the embedded guides;
- Work on roof to allow for the installation of supporting structures for hoppers and trunks;
- Modification to the planned concreting work method for the sills;
- Purchase of winter clothing.



Reduction of CRT's schedule for the upstream work:

- Mobilization of a second supervision crew;
- Mobilization of a second construction crew and replacement of five (5) initially planned workers; and
- Mobilization of additional equipment.



Additional reduction of CRT's schedule:

- Mobilization of additional supervision personnel;
- Mobilization of additional workers;
- Mobilization of additional equipment; and
- Mobilization of additional head office personnel.



Consequences of the changed conditions on CRT's work **CIMFP Exhibit P-02956**

Additional costs:

Temporary shelter for the concrete mixer for acceleration – CHO n° CO-CRT-001	\$89,125
Revised concreting method – CHO n° CO-CRT-002	\$1,300,000
Shelter modification – CHO n° CO-CRT-006	\$228,562
Pouring of sills without access for mixer trucks – CHO n° CO-CRT-006	\$12,075
Accelerated concreting schedule – CHO n° CO-CRT-004	\$2,922,062
Training costs for the use of scissor-lifts – CHO n° CO-CRT-006	\$52,980
Sub-total	\$4,604,804
Andritz's Mark-up for Administration and Profit (15%)	\$690,721
Total	\$5,295,525



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CONSEQUENCES OF THE CHANGED CONDITIONS ON ISKUETEU'S WORK (SECTION 5)



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Consequences of the changed conditions on Iskueteu's work

Iskueteu's Scope of Work:

Performance of the electrical installation work on:

- The Hoist Houses;
- The Upstream bays;
- The Spillway gates and access bay;
- The Trash cleaner;
- The Downstream bays;
- The Spillway electrical building;
- The Fuel bay.



Consequences of the changed conditions on Iskueteu's work

Iskueteu's planned and actual start dates:

Activity	Planned Start	Actual Start	Delay
Hoist Houses	March 14, 2016	April 3, 2016	3 weeks
Upstream bays	April 24, 2016	February 19, 2016	-9.3 weeks
Spillway gates and access bay	April 16, 2016	February 19, 2016	-8.1 weeks
Trash cleaner	July 11, 2016	August 21, 2016	5.9 weeks
Downstream bays	April 26, 2016	February 19, 2016	-9.6 weeks
Spillway electrical building	June 6, 2016	July 19, 2016	6.1 weeks
Fuel bay	June 3, 2016	September 28, 2016	16.7 weeks



Consequences of the changed conditions on Iskueteu's work

- Changed execution conditions;
- Changes to the installation sequence;
- Congestion of the work areas;
- Impacts of the premature watering up.





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Changed execution conditions:

- Performance of additional work in-situ;
- Supply and installation of weather protection.







Changes to the installation sequence:

- Mobilization of additional workers and resulting loss of productivity
- · Extended duration of work shifts
- Work on multiple fronts



Congestion of the work areas:





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Impacts of the premature watering-up:

- 1. Loss of productivity due to congestion in the work areas
- 2. Idle time of construction crews and equipment
- 3. Performance of work on multiple fronts



Additional costs:

Latest amount received from Iskueteu⁽¹⁾

Andritz's Mark-up for Administration and Profit (15%)

Total	\$5,905,631
	\$770,300
Sub-total	\$5,135,331
	\$5,135,331

(1) Iskueteu claim under review



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CONSEQUENCES OF THE CHANGED CONDITIONS ON CANMEC'S WORK (SECTION 4)



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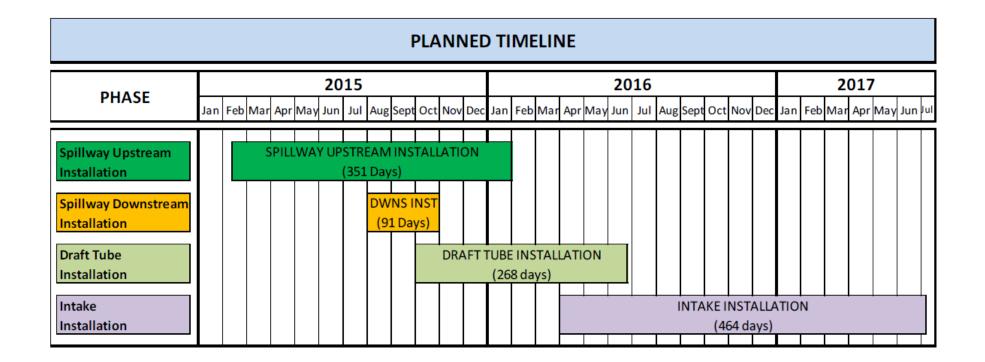
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Canmec's Scope of Work:

- Supply of the spillway embedded parts;
- Supply of the spillway hoists, hoist housing and superstructures;
- Installation of the spillway hydro-mechanical equipment;
- Supply of the Intake and draft tube embedded parts;
- Installation of the Intake and draft tube hydro-mechanical equipment.



Canmec's planned timeline:





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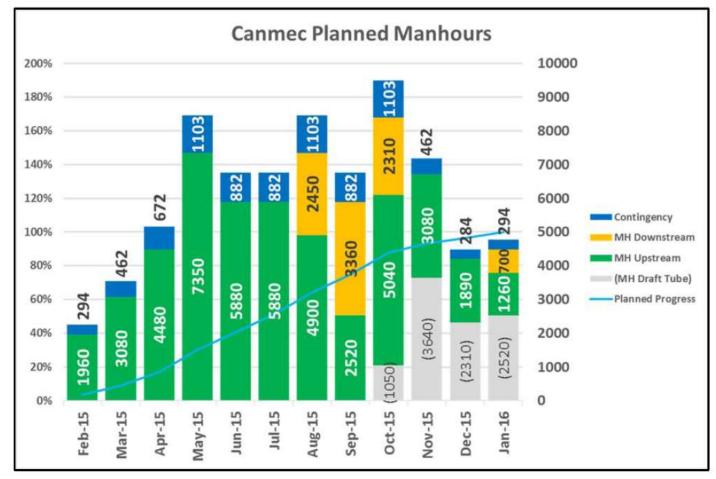
Anticipated conditions:

- Upstream spillway installation Work would be started on or around February 16th, 2015, downstream Work on or around August 1st, 2015, with a target completion date of February 1st, 2016, representing a total available duration of 351 days.
- Civil work by others would be 100% completed prior to Canmec's mobilization.
- Spillway channels would be free for occupation prior to Canmec's mobilization.
- No overhead work would be done by other contractors above Canmec's work sites.
- Delivery of permanent equipment "just in time" for installation.
- Possibility of maximizing the work in summer months.
- Execution of downstream embedded guide installation in parallel with the upstream Work and outside of the critical path.
- Global duration allowing for schedule flexibility.
- Possibility for Canmec to use the available period at its own discretion and to adjust its work sequence, if required.



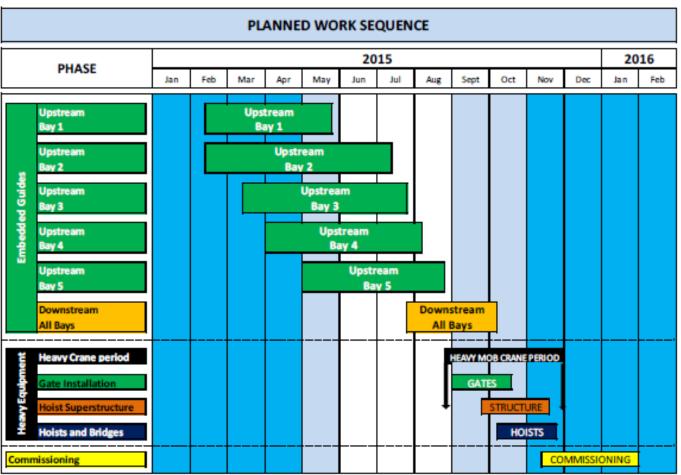
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Planned execution strategy:





Planned Work Sequence:





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Planned Work Sequence:

- 1. Installation of Embedded Guides
- 2. Heavy Equipment (Gates, Hoists and Hoist Superstructures)
- 3. Start-up and Commissioning



Company's delays and directive to accelerate the Work:

- Anticipated site conditions confirmed by Company in June and in July of 2015:
- 1. Spillway discharge channel would be free from Company's civil work contractor for occupation by Canmec on September 1st.
- 2. Work areas adjacent to other contractors (sic) would be avoided by Company. This included work fronts on the spillway structure and in the upstream and downstream channels.
- 3. Cranes, crane foundations, trailers, and other temporary infrastructure, unused material, etc., would be removed from the upstream or downstream areas by Company's civil works contractor before they were occupied by Andritz.
- 4. River diversion to start in July 2016.



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Failure to Supply Unobstructed Access to Work Areas:



This picture taken on September 4th, 2015, shows multiple pieces of equipment, such as a tower crane, vehicles, raw materials and a man lift, belonging to Company's civil contractor and that were still interfering with Canmec's Work in the spillway discharge channel.



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Failure to Supply Unobstructed Access to Work Areas:



This picture taken on November 1_{st}, 2015 shows the presence of Company's civil contractor in all five bays in the upstream area. The work executed by Company's civil contractor in the man lift was creating a potential overhead work situation for Canmec, with high HSE risks, thus preventing Canmec from starting its activities upstream.



Consequences of the changed conditions on

Canmec's work

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Company-Caused Impediments:

Period

November 2015 to February 2016

February 2016 to April 2016

May 29th, 2016 to June 8th, 2016

July 2016 to November 2016

Impediments

- Civil work (primary anchors) not completed by Company's civil contractor
- Piers movement affecting Canmec's ability to align the embedded guides
- Company's civil contractor tower crane collision with the south tower installed by Canmec
- Early diversion of the river prior to completion of the requirements setout by Company in CHO-010



Impediments caused by changed execution conditions:

Aggravated Hoarding issues

Aggravated Side Plate weld repairs

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Actual work sequence:

- The incomplete civil work affected Canmec's ability to properly implement its acceleration plan, thus postponing the installation of the embedded guides to the most severe winter period.
- The completion objective imposed by Company forced Canmec to increase its workforce and its work areas, thus preventing Canmec from following its execution strategy.



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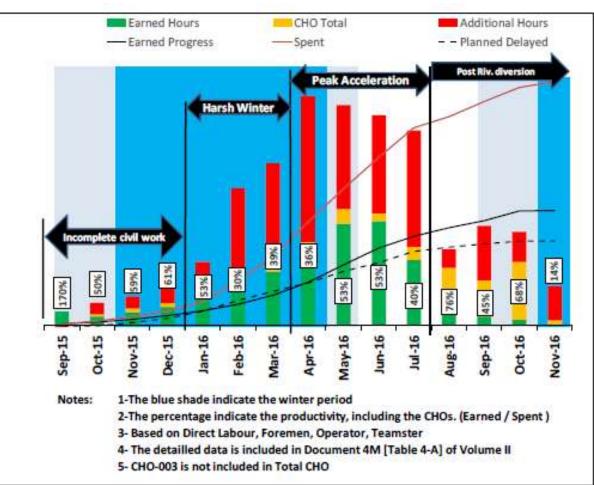
Examples of continuous revisions to priorities:

- Interference with Company's civil contractor during spillway gate installation in bay#1
- Presence of Andritz's other contractor Iskueteu during spillway gate installation in bay #5
- Waiting for the master key to unlock gate #1
- Waiting for water drainage



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Actual progress and performance:





Consequences of the changed conditions on

Canmec's work

September 2015 to January 2016

January to March 2016

August to November 2016

April to July 2016

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Main problems during execution phases:

Period

Problems

- Interference with Company's civil contractor and delay related to the lack of completion of Company's civil work
 - The compounded effect of acceleration, winter conditions and other impediments resulted in extremely low productivity
 - The intensive acceleration measures (increase in manpower level, second shift, overtime work) prevented Canmec from achieving its anticipated performance.
 - Drastic decrease in the workforce due to the reduction of the available working area, further to River Diversion



Photos demonstrating encountered impediments:



This picture, taken on November 22nd, 2015, shows the presence of much equipment, belonging to Company's civil contractor, such as a bus, light vehicle, tower crane and man lift. Also, the orange tarps on top of the piers indicate that there is still overhead work being performed by Company's civil contractor, adding HSE risks to Canmec's working area, thus preventing Canmec from progressing as planned.

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Photos demonstrating encountered impediments:

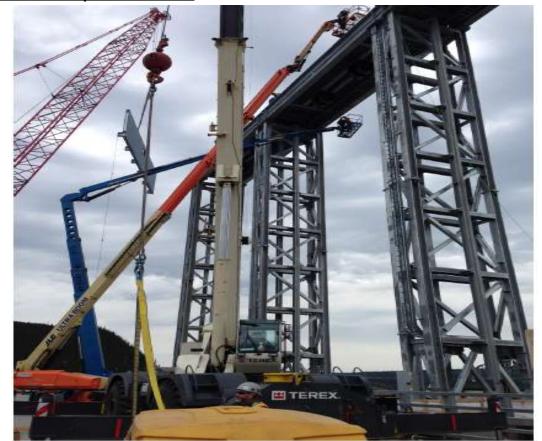


This picture, taken on January 31st 2016, shows workers trying to install a sill beam in its dedicated recess obstructed with ice and snow that was there prior to hoarding installation. This kind of situation creates HSE hazards and directly affects worker productivity, thus delaying progress.



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Photos demonstrating encountered impediments:



This picture, taken in June 2016, shows an example of work on multiple fronts. In order to respect the acceleration directive, Canmec simultaneously executed multiple activities, thus creating congestion in the working area, adding HSE risks and ultimately affecting productivity.



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Photos demonstrating encountered impediments:



After the river diversion, Canmec and Andritz's other sub-contractors had no other choice but to use the permanent bridge, creating congestion in the working area as shown on this picture, taken in September 2016.



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Canmec's categories of cost:

- 1. Additional Direct Manpower Costs
- 2. Lost Productivity Due to Winter Working Conditions and to acceleration
 - I. Overmanning
 - II. Congestion
 - III. Second Shift
 - IV. Overtime
 - V. Winter Conditions
 - VI. Learning Curve
- 3. Increased staff, supervision and indirect expenses
- 4. Additional small tools, personal protection equipment and consumables
- 5. Additional equipment hours
- 6. Extra work on Change Orders
- 7. Remaining work



Canmec's additional costs:

Labour Cost (Productivity Loss)		\$13,969,313
Increased Staff Cost		\$5,523,409
Small Tools, PPE, Consumable		\$2,850,142
Equipment Cost		\$7,028,333
Canmec Owned Additional Expenses		(\$319,815)
	Total Additional Cost:	\$29,051,382
Extra Work Paid:		(\$2,938,955)
	Total	\$26,112,427



Canmec's other costs:

	Total	\$1,250,000
Preparation of this Request (as of January 31st, 2017)		\$350,000
Financing Costs (as of January 31st, 2017)		\$700,000
Bonding		\$200,000

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Results of Andritz Acceleration Efforts

for

MUSKRAT FALLS HYDROELECTRICAL Lower Churchill Project – Labrador, Canada

May 16, 2017

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1. Introduction

2. Planned Schedule Development

3. Analysis of Progress and Acceleration Achieved

1. Introduction

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<u>C2G was requested to complete an independent review of Project Progress to determine</u>:

- Critical path schedule delays experienced
- Schedule acceleration achieved
- Assess causation for any measured delays
- Assess acceleration measures

C2G reviewed relevant project documents and records:

- Contract documents and site plans
- Project photographs
- Primavera P6 project schedules and schedule updates
- Company acceleration requests and directives
- Andritz Acceleration proposals
- Andritz time extension requests
- Project correspondence and meeting minutes
- Andritz and sub-contractor daily reports
- Andritz and sub-contractor requests for compensation submitted to Company

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1. Introduction

2. Planned Schedule Development

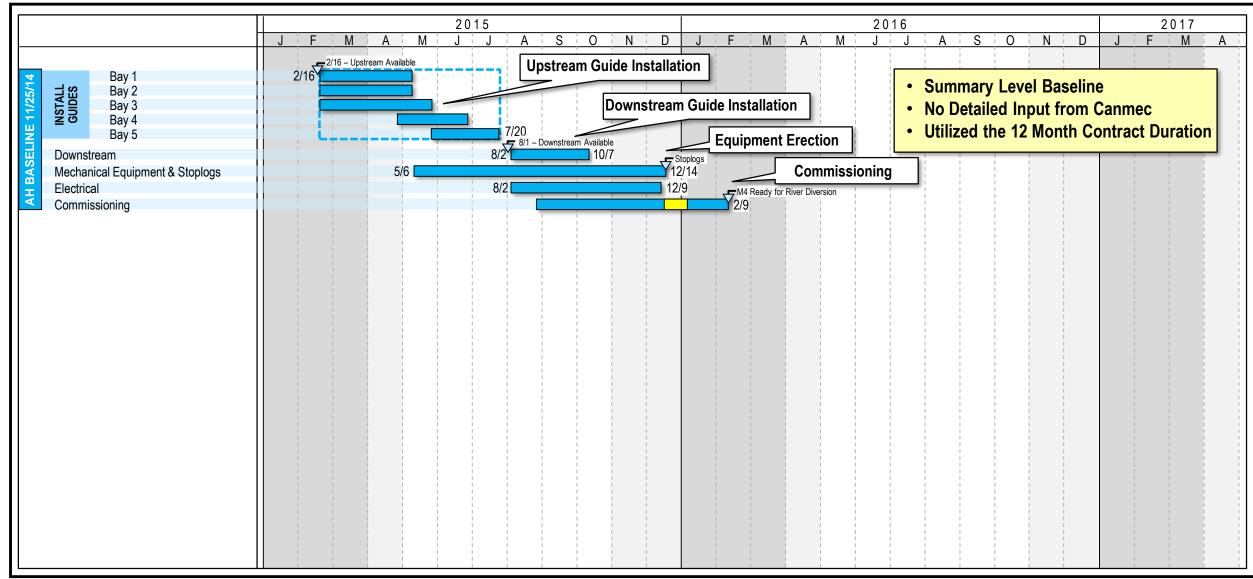
3. Analysis of Progress and Acceleration Achieved

2. Planned Schedule Development

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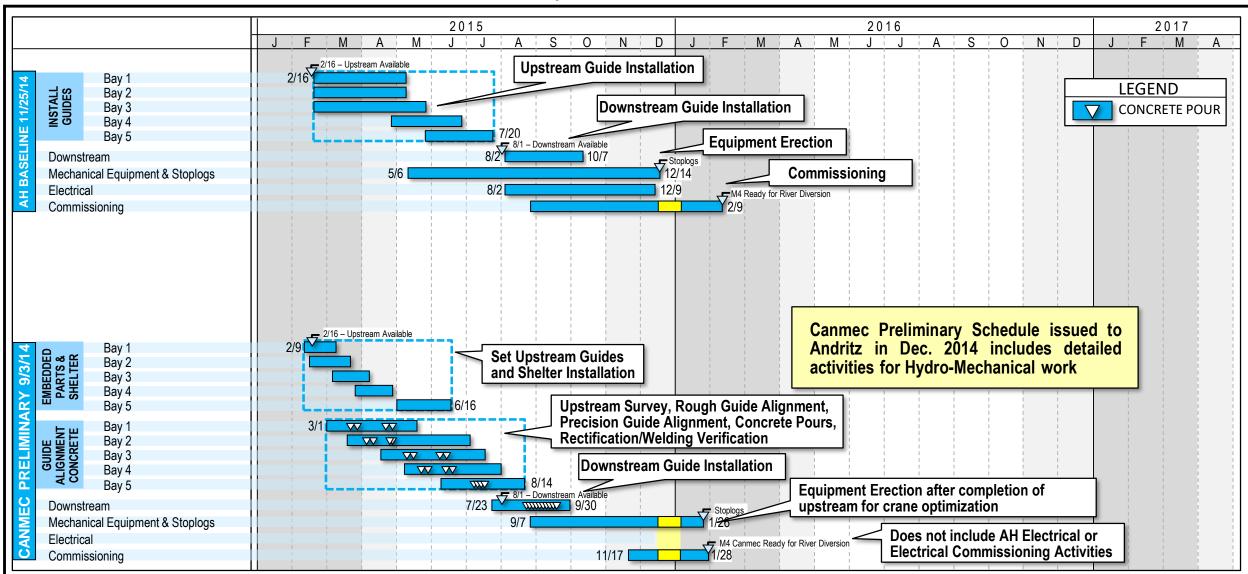
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Summary of Andritz Baseline Schedule



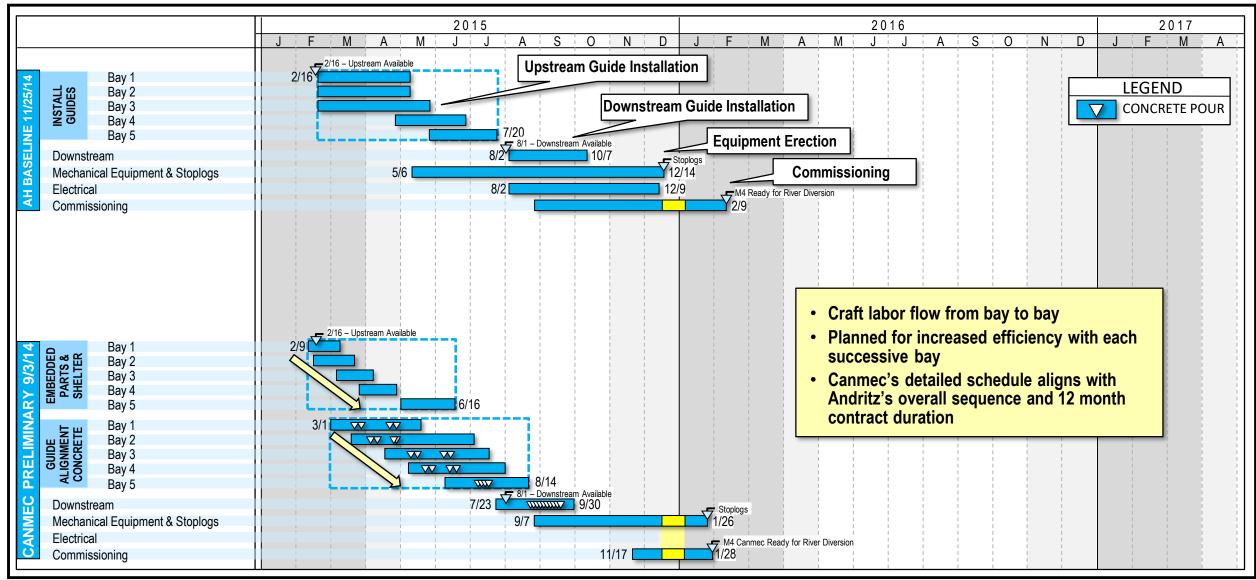
2. Planned Schedule Development

Andritz Baseline Schedule vs. Canmec Preliminary Schedule



2. Planned Schedule Development CIMFP Exhibit P-02956

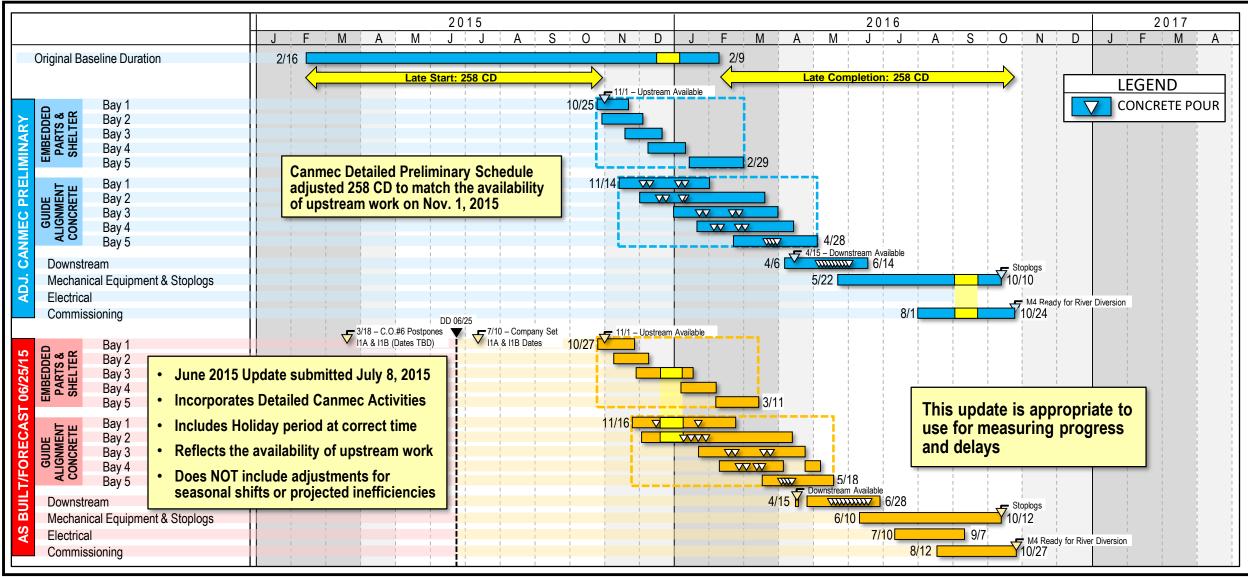
Andritz Baseline Schedule vs. Canmec Preliminary Schedule



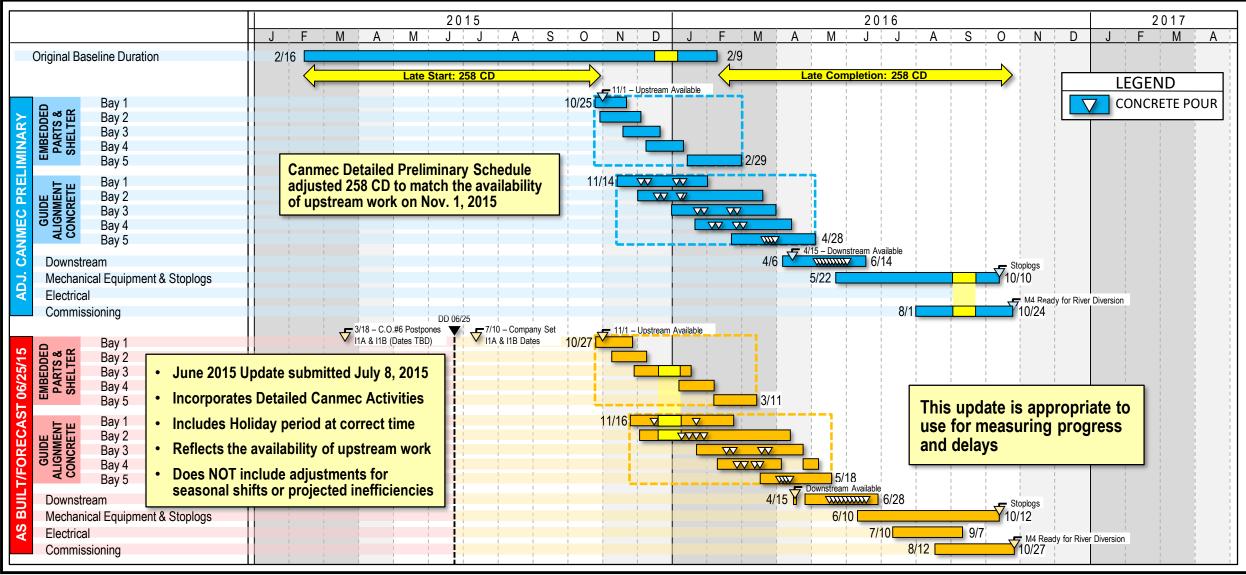
2. Planned Schedule Development CIMFP Exhibit P-02956

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Canmec Preliminary Schedule Adjusted vs. Andritz June 25, 2015 Schedule Update

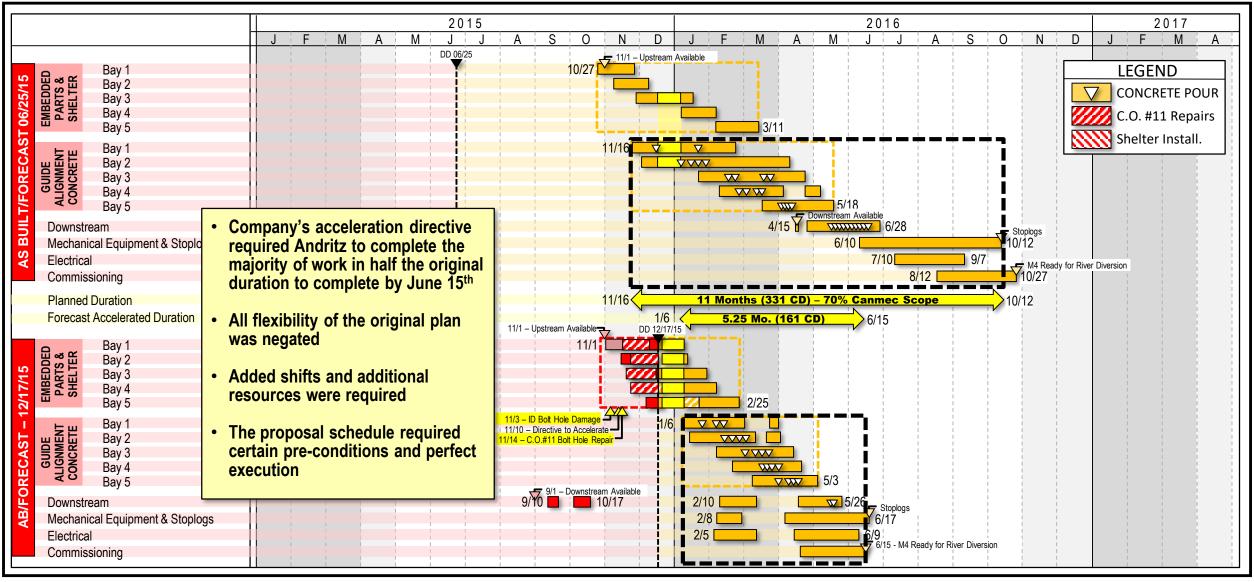


Canmec Preliminary Schedule Adjusted vs. Andritz June 25, 2015 Schedule Update

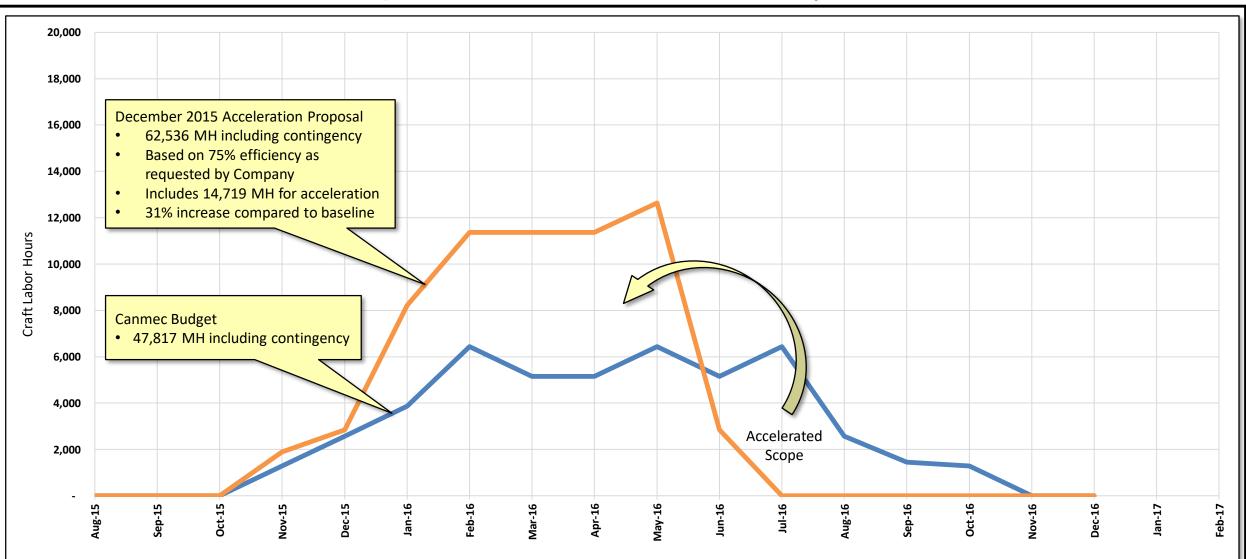


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Andritz June 25, 2015 Schedule Update vs. December 17, 2015 Preliminary Accelerated Schedule



Andritz June 25, 2015 Schedule Update vs. December 17, 2015 Preliminary Accelerated Schedule



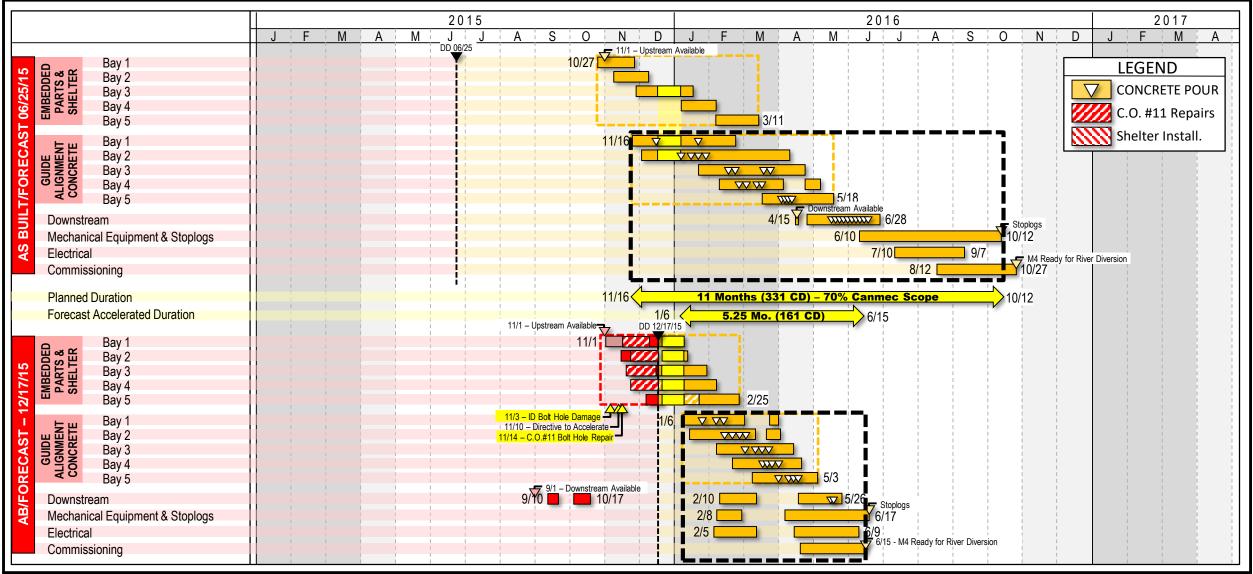
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1. Introduction

2. Planned Schedule Development

3. Analysis of Progress and Acceleration Achieved

Andritz June 25, 2015 Schedule Update vs. December 17, 2015 Preliminary Accelerated Schedule

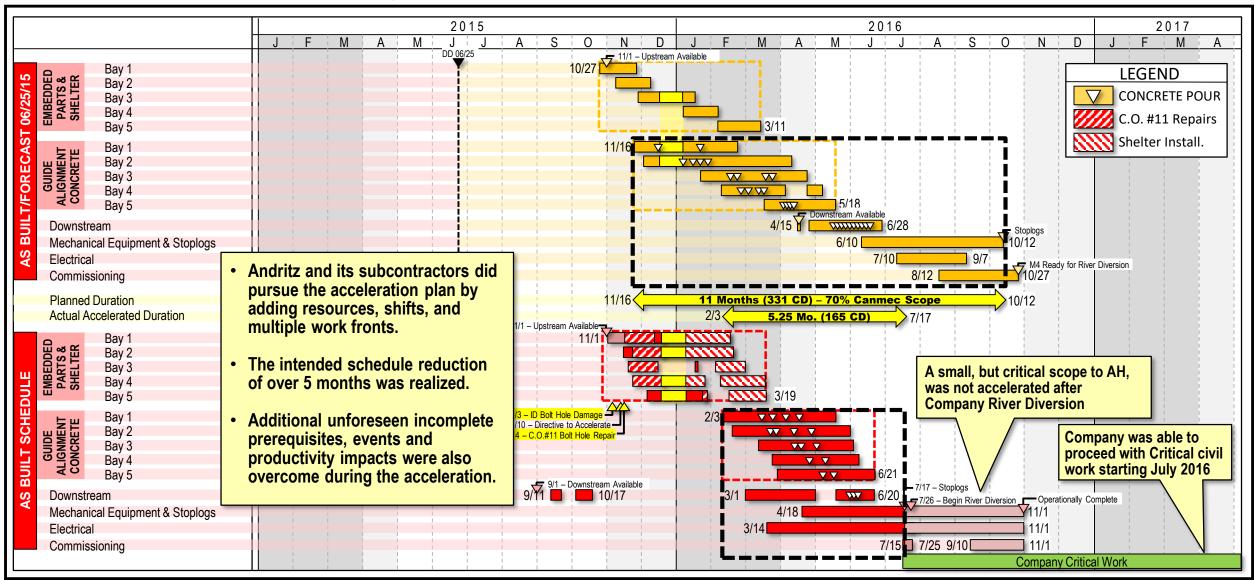


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Andritz June 25, 2015 Schedule Update vs. As-Built

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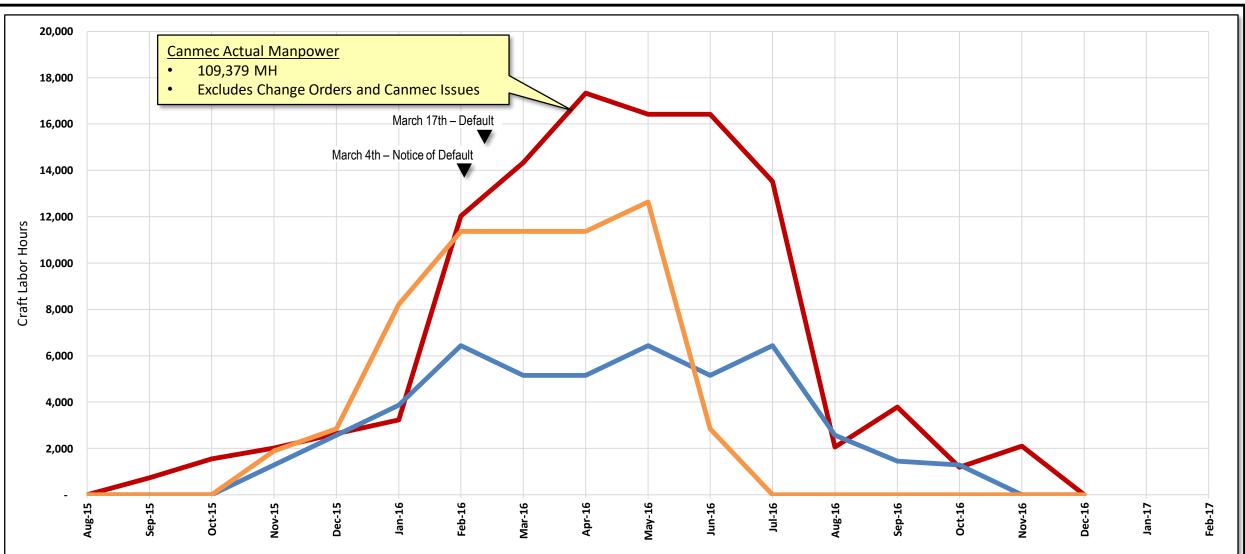
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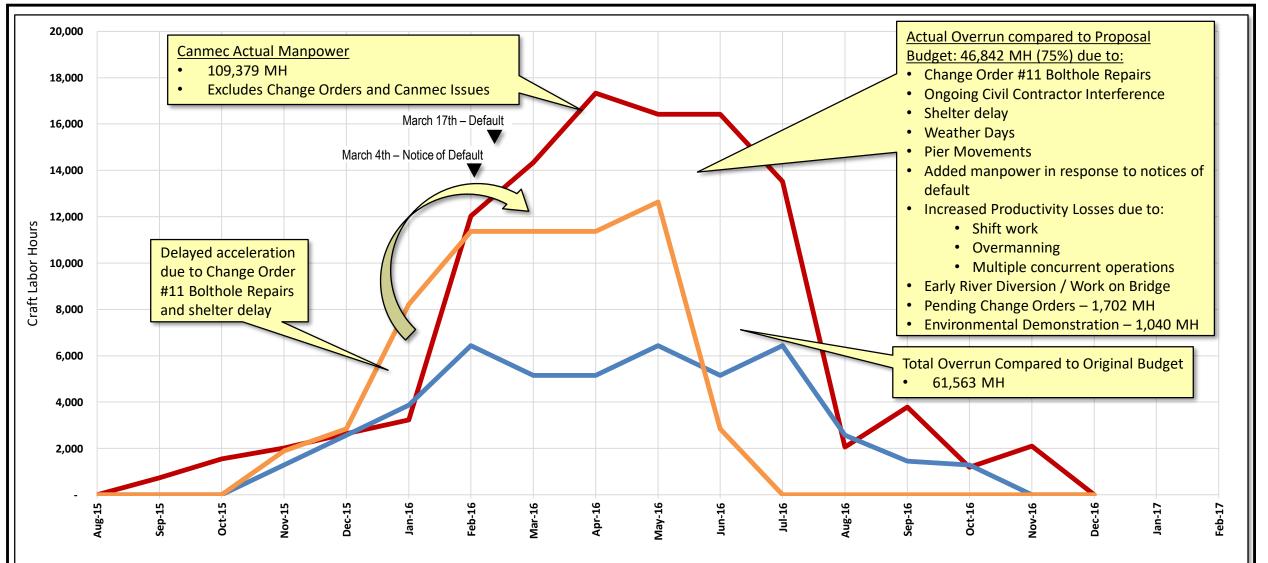
Andritz June 25, 2015 Schedule Update vs. As-Built

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Andritz June 25, 2015 Schedule Update vs. As-Built

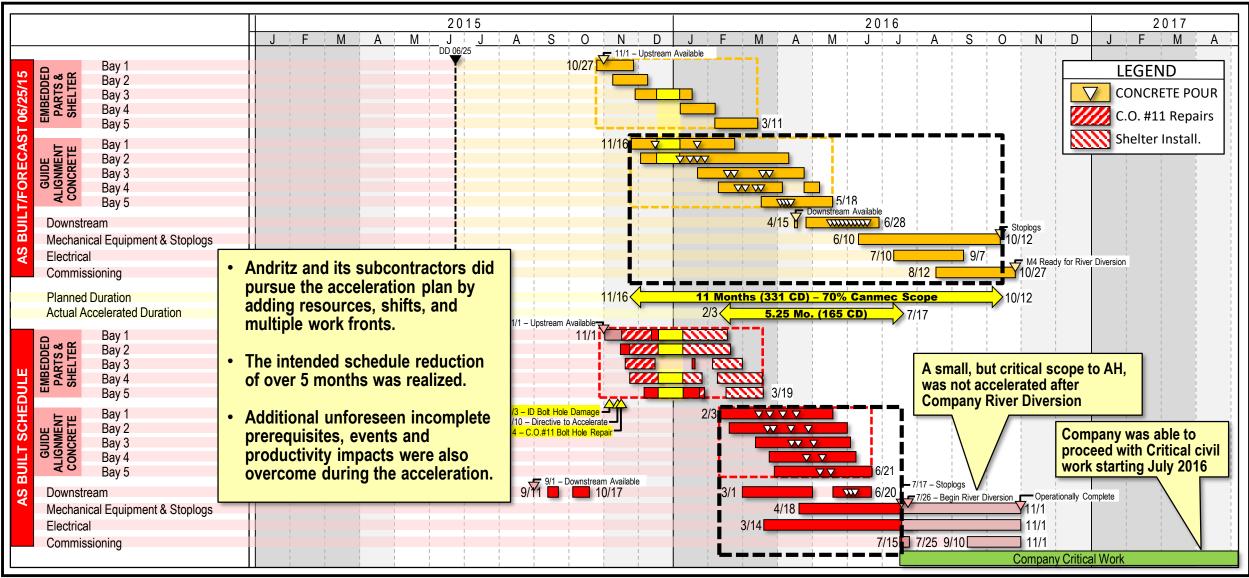
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Andritz June 25, 2015 Schedule Update vs. As-Built

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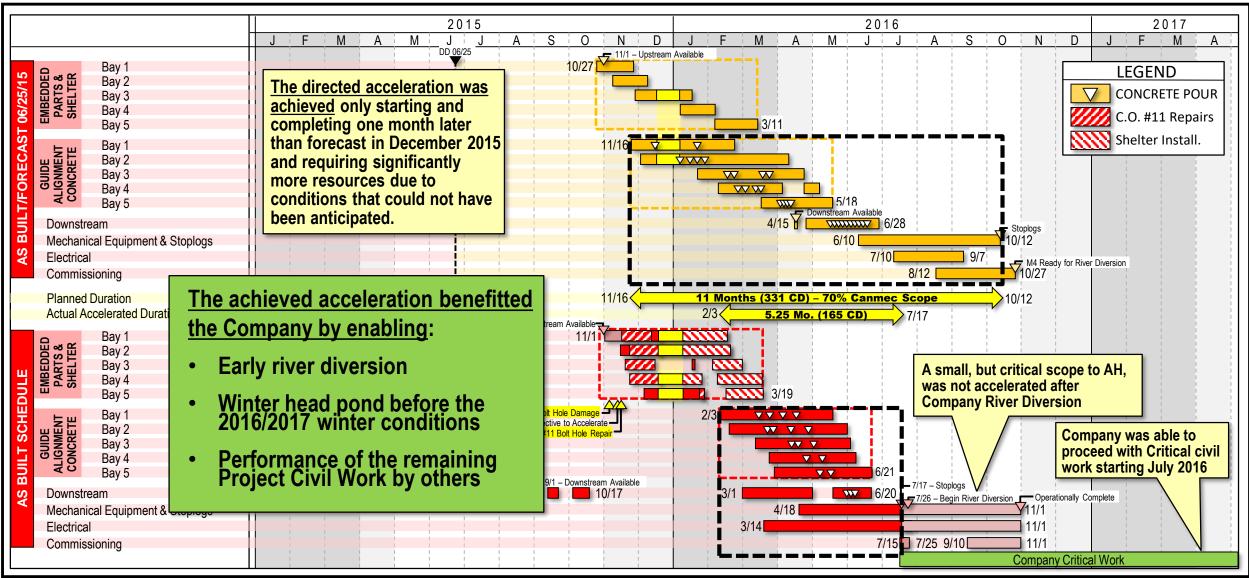


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Andritz June 25, 2015 Schedule Update vs. As-Built

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Results of Andritz Acceleration Efforts

for

MUSKRAT FALLS HYDROELECTRICAL Lower Churchill Project – Labrador, Canada

May 16, 2017

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SUMMARY AND CONCLUSION (SECTION 7)

CIMFP Exhibit P-02956

Summary and Conclusion CIMFP Exhibit P-02956

As a result of the late start of the Spillway Work and of the acceleration directive issued by Company, the actual conditions under which the work was performed were drastically different than the anticipated conditions based on the Agreement provisions and on the planned schedule and sequence for the performance of the Work.



Summary and Conclusion CIMFP Exhibit P-02956

Summary of the Costs (including Andritz's Mark-up):

	Total	\$49,287,582
Other costs:		\$1,782,060
Cost incurred by Canmec		\$30,029,291
Cost claimed by Iskueteu ⁽¹⁾		\$5,905,631
Cost incurred by CRT		\$5,295,525
Cost incurred by Andritz		\$6,275,075

(1) Iskueteu claim under review

