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Cc: [Frank Gillespie](#); [Paul Adams](#)
Subject: Andritz slide presentation
Date: Tuesday, December 12, 2017 4:11:05 PM
Attachments: [.png](#)
[Andritz Site Issues MODIFIED \(TS\) All.002.pptx](#)

Scott/Frank,

attached for review is the complete slide presentation, since our afternoon discussion and final clean-up (TS/FG/BD/PA), I have added the Commercial's input as slide 22, and Richard's on the re-sequencing as slide 18. Would also suggest though, as I said it seems a hard way to start the discussion, that we make some sort of "Without Prejudice" or legal disclaimer in here somewhere. Also have gone back to Mike on the Labour Relations slide, filled in a couple of items there myself. as discussed with Frank, not much (if anything) in here that I would not share with Andritz. Final kick at the cat in the a.m.

Paul



Andritz Site Issues MODIFIED (TS) All.pptx

Paul Adams

Area Manager- Mechanical & Electrical

PROJECT DELIVERY TEAM

Lower Churchill Project

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Lower Churchill Project

Andritz Site Issues

15-December-2017

Boundless Energy



CH0030

Installation Issues

Powerhouse CH0030

- Missing Tools & Equipment
 - Construction tooling
 - Lifting Equipment
- OHS Stop Work Orders
 - Engineered Dunnage
- Weld Repairs Stay Ring
- Stay Ring Lift (Lift Plan, Lifting equipment, Engineering review and approval, Site Coordination and Communications Issues, HSE Shut Down)
- Change in Installation Sequence
- Bolt Torqueing Issue Temporary Bulkhead Units 3 and 4
- Progress Reporting

Re-Preservation

- HSE Issues requiring Shut Down and re-assessment of Andritz focus
- Poor progress vs Costs to Date
- Has Best Value for LCP been addressed in issue of Sub Contracts
- No plan for Repair of defective components (Andritz Responsibility)

Labour Issues

- Lack of Labour Relations management
 - Issues with Boilermakers
 - Issues with Millwrights
 - Sunday working period
- Respectful Workplace issues
- Sunday & Nightshifts
- **MIKE HARRIS et al to modify**

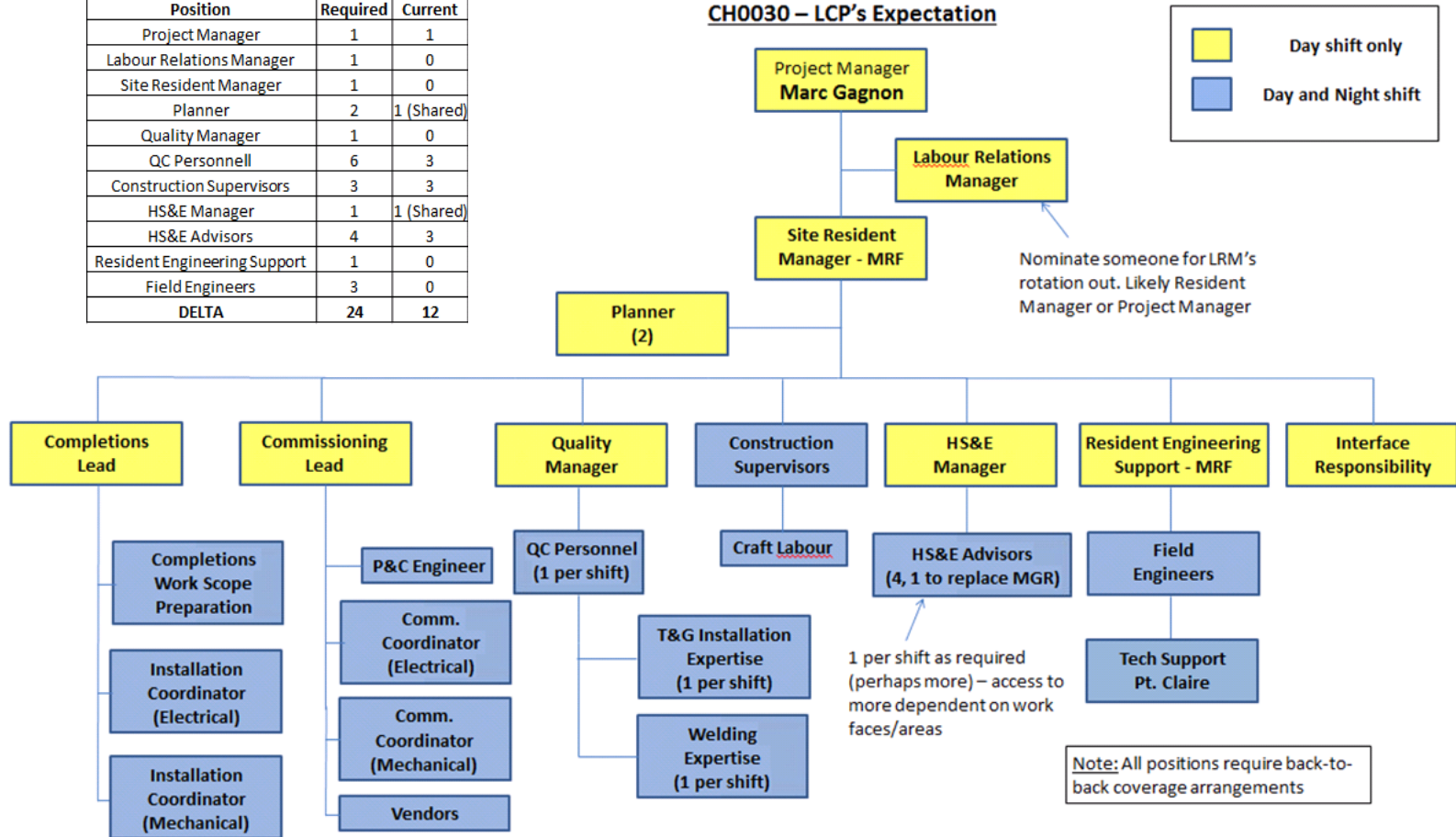
General Notes

- Separate, dedicated and properly staffed site teams are contractually required for each of the CH0030 and CH0032 packages
- Andritz Corporate Management has not supported it's site team with experienced management team members in key positions
- Andritz lack of Corporate support has taxed LCP Package Management
- Key Roles (when adequately supported) will require complete coverage when primary team member on rotation
- Insufficient resources to cover all work areas and all shifts
- No on site engineering or field engineering technical support slowing response time to queries, quality and other activities required for a solid work continuum
- Inadequate construction supervision support
- Site project controls is non-existent
- A single resource for Planning is not acceptable (ongoing issue since Spillway construction in 2015/2016)
- No Completions or Commissioning personnel identified
- Andritz has not demonstrated concern or been pro-active in filling site roles

CH0030 Organization

List of Personnel		
Position	Required	Current
Project Manager	1	1
Labour Relations Manager	1	0
Site Resident Manager	1	0
Planner	2	1 (Shared)
Quality Manager	1	0
QC Personnell	6	3
Construction Supervisors	3	3
HS&E Manager	1	1 (Shared)
HS&E Advisors	4	3
Resident Engineering Support	1	0
Field Engineers	3	0
DELTA	24	12

CH0030 – LCP’s Expectation



Note: All positions require back-to-back coverage arrangements

CH0030 Organization

On Site Engineering Support

- There is no resident engineering technical support assigned to the site. Andritz relies on personnel in its Pointe Claire office to respond to technical issues. LCP Package Lead consulted often to address site technical issues depleting LCP resources
- Basic construction activities are affected (Ex: Critical Lifts, Clashes with Civil works, sequencing of parts in the SSB)

Quality

- Poor or minimum QC of submitted documents – reliance on LCP to identify and fix basic errors
- Quality Manager is a shared resource with CH0032, this is not acceptable. Focus is required for this package to address the many quality issues that have arisen this far (rebar clashes, turnbuckle and plate positioning, Stay Ring nelson studs, bolt torquing, preservation system deterioration and dunnage)
- Experienced back to back coverage for Quality Specialist required
- Currently require QA Manager and 2 QA/QC Specialists

CH0030 Organization

Project Controls & Planning

- Critical Roles as weekly construction report, 3 week look ahead reports and overall construction progress are critical inputs to LCP coordination and construction progress reporting programs.
- Currently weekly reporting has fallen behind (Ex: 3WLA Schedule submission)
- Lack of daily planning of work activities for both day and night shifts (reactive, not proactive)
- No control schedule updates (native data) on monthly, bi-weekly or weekly basis. This is a crucial item for our contract and integration management, as well as reporting
- Control Schedule comments returned to Andritz 06Nov17 to address issues (significant logic issues). Still awaiting re-submission
- Weekly reporting required as per contract

HSE

- Performance thus far indicates a lack of sufficient competent resources to suit site construction requirements
- Lack of Corporate Safety Culture
- Lack of comprehension of LCP's Site Health Safety and Environmental and "Zero Harm" policy.

CH0030 Andritz Role Descriptions

Andritz need to provide more qualified personnel for this team

LCP Minimum Requirements

Quality Manager

- Minimum 10-15 years experience in QA/QC on large mechanical installation projects;
- Technical degree in Mechanical Engineering/Technologist and/or significant pertinent experience in construction site quality assurance and quality control as related to Turbine & Generator installations or equivalent;
- Certified welding inspector Level 2/3
- NDE certification considered an asset
- ISO Lead/Internal Auditor considered an asset;

CH0030 Andritz Role Descriptions

LCP Minimum Requirements

Quality Inspector

- Minimum 5-7 years experience in Turbine & Generator installations
- Bachelor's degree in Mechanical Engineering and/or Senior Technologist with relevant experience in construction site quality assurance and quality control as related to Turbine & Generator installations
- CWB certified welding supervisor and/or welding inspector considered an asset
- NDE certification considered an asset;

CH0030 Andritz Role Descriptions

LCP Minimum Requirements

HSE Lead

- 7-10 years experience with at least 3 in a field /project environment
- Cross shift for the HS Manager, so has to be competent in the role of HSE Manager.
- Competent in executing SMS elements to include but not limited to inspections, conducting investigations, delivering presentations, managing HS team members, coaching and advising in the field,
- Visible leader in promoting safety culture, analyze performance metrics, hazard and risk analysis.
- Competent in identifying high risk activities such as LOTO, WAH, CS.

CH0030 Andritz Role Descriptions

LCP Minimum Requirements

Commissioning Lead

- 10-15 years demonstrated experience in Commissioning of major projects – Hydro experience an asset
- Responsible for development of Commissioning Procedures for AH scope
- Responsible to ensure the commissioning of project assets meets specifications and comply with Nalcor safety standards
- Responsible for coordinating Vendors at site to support Commissioning

Commissioning Coordinator Mechanical

- 5 – 10 years Commissioning experience on major projects
- Responsible for field execution of Commissioning activities for Mechanical discipline
- Safety - Ensuring the safety of all personnel through daily tool box talks and ensuring adherence to lockout/tag-out program
- Review all Mechanical Static Testing, completing all "B" Check Sheets
- Coordinate contractor Mechanical vendors / specialists during the execution of Commissioning activities
- Lead Contractor punchlist close-out for Mechanical discipline as they pertain to Commissioning

CH0030 Andritz Role Descriptions

LCP Minimum Requirements Commissioning

Commissioning Coordinator Electrical

- 5 – 10 years Commissioning experience on major projects
- Responsible for field execution of Commissioning activities for Electrical discipline
- Coordinate contractor Electrical vendors / specialists during the execution of Commissioning activities
- Lead Contractor punchlist close-out for Electrical discipline as they pertain to Commissioning
- Safety - Ensuring the safety of all personnel through daily tool box talks and ensuring adherence to lockout/tag-out program
- Review all Mechanical Static Testing, completing all "B" Check Sheets

P&C Engineer

- 5-10 years experience with P&C design / Commissioning on major projects
- Responsible for ensuring all required FAT testing for P&C equipment has been complete prior to delivery to site with minimal carry-over work
- Responsible for coordination of all Contractor led points testing
- Responsible for coordinating Company's design comments into all GUIs and PLC coding
- Responsible for compilation of all As-Built data as it pertains to PLC settings files, program coding, SCADA points mapping, etc..

CH0030 Andritz Role Descriptions

LCP Minimum Requirements Completions

Completions Lead

- Bachelor's Degree in Engineering (Mechanical preferable); 10-15 years experience in major projects
- Responsible for coordination of all Mechanical Completion activities related to the Andritz Hydro CH0030 Scope
- Verify and manage the contractors progress through Construction and Mechanical Completion
- Ensures Contractor safe work practices are adhered to
- Ensures overall Completions schedule is adhered to

CH0030 Andritz Role Descriptions

LCP Minimum Requirements - Completions

Completions Work Scope Preparation

- 5-10 years relevant experience in Completions / Commissioning – Hydro experience an asset
- Bachelor's Degree in Engineering; 10-15 years experience major projects
- PCS Familiarity
- Responsible for work scope planning, PCS Administration (planning and execution stage), MC / SC checklist generation and scheduling interface

Installation Coordinator Mechanical

- 5 years experience major projects with familiarity in Completions
- Coordinate the field execution of MC activities for Mechanical discipline
- Coordinate Walk Downs for Mechanical Scope
- Lead Contractor punchlist close-out for Mechanical discipline

Installation Coordinator Electrical

- 5 years experience major projects with familiarity in Completions
- Coordinate the field execution of MC activities for Electrical discipline
- Coordinate Walk Downs for Electrical Scope
- Lead Contractor punchlist close-out for Electrical discipline

Stay Ring Assembly and Installation Performance

- 18 August two stay ring sections moved to powerhouse
- 26 September stay ring bolted together
 - Between 18 August and 26 September there were 12 days with no activity on the stay ring
- 19 October Welding of Stay Ring Joints started
 - Between 26 September and 19 October Stay Ring was leveled and work platform installed.
 - There were 14 days with no activity on the Stay Ring
- 21 November Welding Completed
 - Problems experienced with control of preheats resulting in rework
 - 1 day lost due to OH&S stand down
 - 2 days lost to Safety stand down
 - 1.5 days lost due to labor unrest following safety stand down
- 30 November Stay Ring Lifted into Pit
 - LCP were required to demand and then walk AH through the preparation of Risk Assessment & Load Plan preparation
 - Last minute changes to lift plan caused by AH initially missing additional weight (work platform left on stay ring)
 - Slings and Shackles not available for revised plan
 - Certification not available for equipment
- Baseline Plan schedule showed start of stay ring work 31 August and lift of stay ring into pit 2 November
- Actual performance; start 13 days early, 30 days lost due to no activity or safety stand downs and 9 days lost due to problems with lift plan. Stay ring placed in pit December 2, 2017, actual lost time 43 days.



Draft Tube Liner Bulk Head

- Draft Tube Liner for Units 3 and 4 were delivered with the bolted bulkheads preinstalled.
- During assembly of the two halves a sample of the bolts installed in China were checked and found to be improperly torqued. 3864 bolts per unit require re-torquing.
- A membrane is installed on the underside of the bulkhead which requires that the studs be flush with the top of the nuts. Numerous studs require adjustment. Estimate number at 7-8000 bolts.



Resequencing of Stay Ring and Pit Liner Installation

- **2013** - Installation sequence was proposed for the stay ring and pit liner that would see the stay ring concreted in place prior to the pit liner being installed on top.
- **2015** - Sequence was changed based on input from Andritz to have the stay ring landed on the temporary support jacks, the pit liner welded on top and then the pit handed over to the civil contractor for concreting.
- November of **2017** in the run up to the installation of the stay ring, LCP was advised that the support jacks were not designed for both the stay ring and pit liner and the construction sequence had to revert to the original plan.
- The late revision to the sequence had impacts on the civil construction work and exposes LCP to claims from the civil contractor.

CH0032

Installation Issues

Powerhouse CH0032

- Critical Lift Draft Tube Crane
- Late delivery of Schedule and Installation procedures

Labour Issues

- Lack of Labour Relations management
- Respectful Workplace issues
 - Interaction with QA staff
 - Situation regarding sexual assault charges
- MIKE HARRIS et al to modify
- Or Dave Clarke??

Commercial Issues

- Problem oriented approach versus solutions oriented approach to issues
- Claims oriented
- Failure to respond to information requests in a timely manner
- Failure to comply with agreement requirements
- Failure to provide adequate cost, schedule or documentary support for Change Requests
- Reimbursable work – failure to comply with Agreement requirements in submitting billing claims
- Commercial/claims oriented approach negatively impacts performance of the work in accordance with the Interface & Milestone Schedule

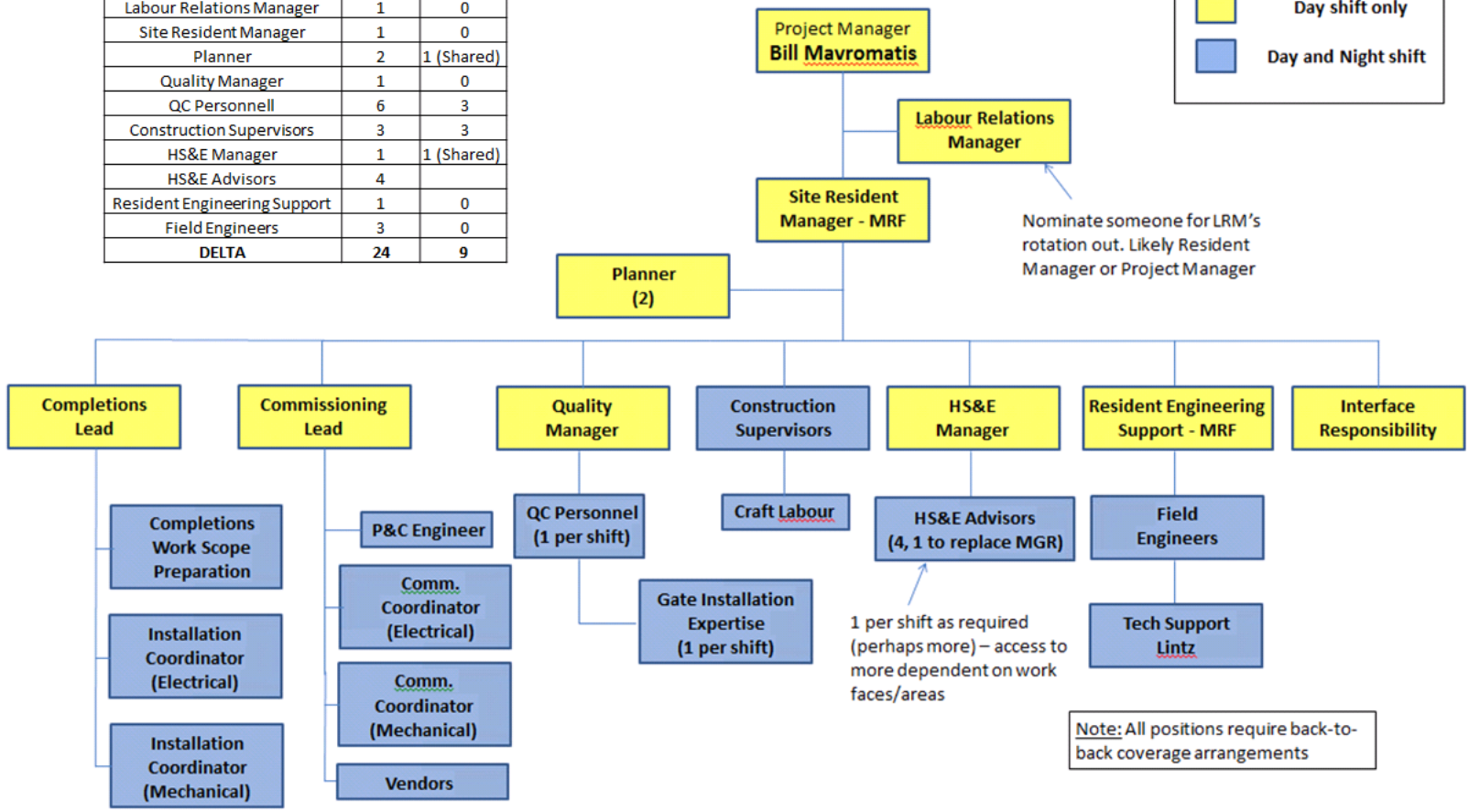
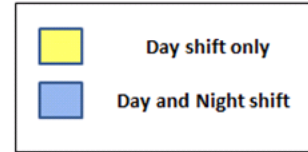
General Notes

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- Andritz lack of Corporate support has taxed LCP Package Management
- Key Roles (when adequately supported) will require complete coverage when primary team member on rotation
- Insufficient resources to cover all work areas and all shifts
- No on site engineering or field engineering technical support slowing response time to queries, quality and other activities required for a solid work continuum
- Inadequate construction supervision support
- Site project controls is non-existent
- A single resource for Planning is not acceptable (ongoing issue since Spillway construction in 2015/2016)
- No Completions or Commissioning personnel identified
- Andritz has not demonstrated concern or been pro-active in filling site roles
- No lessons learned from Spillway Phase 1 work applied to Powerhouse and Spillway Phase 2

CH0032 Organization

List of Personnell		
Position	Required	Current
Project Manager	1	1
Labour Relations Manager	1	0
Site Resident Manager	1	0
Planner	2	1 (Shared)
Quality Manager	1	0
QC Personnell	6	3
Construction Supervisors	3	3
HS&E Manager	1	1 (Shared)
HS&E Advisors	4	
Resident Engineering Support	1	0
Field Engineers	3	0
DELTA	24	9

CH0032 – LCP's Expectation



CH0032 Organization

Project Controls & Planning

- Critical position as weekly construction report, 3 week look ahead reports and overall construction progress monitoring are critical inputs to LCP coordination and construction progress reporting programs.
- Andritz lack of adequate planning resources was evident on the Spillway construction as LCP was forced to generate its own weekly reporting scheme to track progress
- Currently weekly reporting has fallen behind (Ex: 3WLA Schedule Issuance)
- Last CH0032 Monthly Progress Report in Aconex was for period ending 25-Aug-2017
- Contractual planning document still not submitted Control Schedule Baseline Document A44. Without this document the schedule cannot be accepted
- No control schedule updates (native data) on monthly, bi-weekly or weekly basis. This is a crucial item for our contract and integration management, as well as reporting
- Weekly Reporting required as per contract

On Site Engineering Support

- There is no resident engineering technical support assigned to the site. Andritz relies on Canmec for technical support yet the MOC Management of Changes process sits with Andritz
- Technical issues are referred back to Linz which is on a different time zone and detracts from speedy resolution of technical issues
- Critical Lift Plans require on site experienced engineer to develop. Reliance on existing personnel and LCP review to identify gaps in technical lift plan is not acceptable

CH0032 Organization

Document Submissions

- Poor or minimum QC of submitted documents – reliance on LCP to identify and fix basic errors

Construction Supervision

- Heavy reliance on JV to manage its own resources

Quality Manager

- No assigned experienced Quality manager assigned to date

HSE Manager

- There is no dedicated HSE Manager assigned to date. This role cannot be a JV position and solely Andritz responsibility

Quality Inspection

- This role cannot be a JV position and solely Andritz responsibility

CH0032 Andritz Role Descriptions

LCP Minimum Requirements

Quality Inspector

- Minimum 5-7 years experience in Gates & Guides installation
- Bachelor's degree in Mechanical Engineering and/or Senior Technologist with relevant experience in construction site quality assurance and quality control as related to Gates & Guides installations
- CWB certified welding supervisor and/or welding inspector considered an asset
- NDE certification considered an asset;

CH0032 Andritz Role Descriptions

LCP Minimum Requirements

HSE Manager

- 10-12 years experience with at least 5 in a manager/leadership role, in a field/project environment
- Implement review, monitor and measure HS performance in a project construction setting.
- Lead contractor Safety Management Systems to ensure it meets or exceeds the LCP MF Integrated Safety Management Systems.
- High level of competency and experience in technical, coaching and advisory role to the senior management team and direct HS reports.
- Support senior management in the development and maintenance of a safety culture that has "Nobody Gets Hurt" philosophy as a fundamental value.
- Effective in interfacing with multiple contractors and LCP at a senior level. Have excellent communication skills in delivering high quality presentations and elements such as investigations and other reports.
- Maintain accurate and timely statistics, data and analysis on HS information. Strong leadership abilities.

CH0032 Andritz Role Descriptions

LCP Minimum Requirements

Commissioning Lead

- 10-15 years demonstrated experience in Commissioning of major projects – Hydro experience an asset
- Responsible for development of Commissioning Procedures for AH scope
- Responsible to ensure the commissioning of project assets meets specifications and comply with Nalcor safety standards
- Responsible for coordinating Vendors at site to support Commissioning

Commissioning Coordinator Mechanical

- 5 – 10 years Commissioning experience on major projects
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CH0032 Andritz Role Descriptions

LCP Minimum Requirements Commissioning

Commissioning Coordinator Electrical

- 5 – 10 years Commissioning experience on major projects
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- Responsible for compilation of all As-Built data as it pertains to PLC settings files, program coding, SCADA points mapping, etc..

CH0032 Andritz Role Descriptions

LCP Minimum Requirements Completions

Completions Lead

- Bachelor's Degree in Engineering (Mechanical preferable); 10-15 years experience in major projects
- Responsible for coordination of all Mechanical Completion activities related to the Andritz Hydro CH0032 Scope
- Verify and manage the contractors progress through Construction and Mechanical Completion
- Ensures Contractor safe work practices are adhered to
- Ensures overall Completions schedule is adhered to

CH0032 Andritz Role Descriptions

LCP Minimum Requirements - Completions

Completions Work Scope Preparation

- 5-10 years relevant experience in Completions / Commissioning – Hydro experience an asset
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- PCS Familiarity
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Installation Coordinator Electrical

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Sharing our ideas in an open and supportive manner to achieve excellence.

Teamwork

Open Communication

Fostering an environment where information moves freely in a timely manner.

Honesty and Trust

Being sincere in everything we say and do.

Relentless commitment to protecting ourselves, our colleagues, and our community.

Safety

Respect and Dignity

Appreciating the individuality of others by our words and actions.

Leadership

Empowering individuals to help, guide and inspire others.

Holding ourselves responsible for our actions and performance.

Accountability