



New York Power Authority

Generating more than electricity

Risk Mitigation Strategy

Lewiston Pump Generating Plant Life Extension and Modernization Program

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Trustee Meeting

NYPA Previous and Current Life Extension and Modernization Projects

- NYPA has undertaken several Life Extension and Modernization Projects (LEMs) at our Generation Facilities.
- Each LEM faced its own set of unique challenges.
- But all had similar risks regarding schedule, global sourcing, shipping, potential for force majeure, unforeseen conditions, environmental and resources.
- We are here today to discuss some of our risk mitigation strategies.

LEMs	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total Cost	
GENERATION																																\$1,174M
RMNPP																																\$298M
St. Lawrence																																\$281M
BG																																\$135M
LPGP																																\$460M



Sampling of Fabrication Locations for LPGP LEM

Major Contracts Awarded	Location
Pump/Turbine Runner Components, Head Covers, Wicket Gates and Shafts	Slovenia, Canada, China, South Korea (respectively)
Motor/Generator	Brazil, Canada
Potheads	Illinois
Generator Step Up Transformers	China
Transformer Transfer Car	New York
Exciters	Virginia
Circuit Breakers	Puerto Rico
Control System Integration	Maine
Servomotors	Alabama, Netherlands



Risk Mitigation Strategy - Schedule

Risk	Risk Mitigation Strategy
Long Project Duration	Maintain and update an overall Unit Project Schedule, coordinate and participate in contractor/vendor schedule update meetings.
Aggressive Schedule	Release material in advance. Order spare parts. Coordinate activities multiple contractors/vendors. Integrated unit schedule. Incorporate “lessons learned” into future work.
Storage of equipment	Lease/rent/build additional space for storage of equipment. Define space needs early. Determine need based on project criteria (uniformity of equipment, schedule, etc.)
Equipment consistency , maintenance & performance	Release material for multiple units. Continue with QA presence in vendor facilities.

Risk Mitigation Strategy – Global Sourcing

Risk	Risk Mitigation Strategy
Quality (Global Sourcing)	Engage QA & expeditors at vendor facilities to ensure equipment and material quality and schedule adherence.
Differing Codes/Standards	Provide additional Engineering time to review and interpret and additional QA support to inspect materials.
Language Barrier	Engage local bi-lingual inspectors and include clauses in contracts for English speaking counterparts.
Time Zones	Conduct meetings and conferences at times where all parties can reasonably meet.
Travel	Include additional dollars in the budget for travel to foreign destinations as well as local fabrication/ machine shops. Use videoconferencing to facilitate conversation.
Exchange Rates	Include exchange rate clauses into the RFQ's/contract documents for the locations where work is being performed.
Escalation Indices	Include indices in the RFQ's/contract documents for both material and labor escalation. If no US index is appropriate a mutually agreed upon index should be used.
Cultural Differences	Be aware of various cultural differences and ask vendors prior to award for any insight into work hours and holidays that they may be used to. Some places shut down for extended holidays.



Inconsistent wrapping

Failed HiPot Indication



Risk Mitigation Strategy – Shipping

Risk	Risk Mitigation Strategy
Shipping	<p>Schedule shipments & request permits early.</p> <p>Conduct shipping study to determine shipping restrictions.</p> <p>Tracking of Shipments.</p> <p>Store equipment on site and at off site storage facilities (Portable cranes may be required to offload larger inventory).</p>
Delivery	<p>Walkthroughs of the delivery entrances to the site as well as determination of the final location of equipment should be performed in advance of deliveries and a rigging plan should be provided by the vendors.</p>



Risk Mitigation Strategy – Force Majeure

Risk	Risk Mitigation Strategy
Earthquake/Tsunami	Develop Recovery Schedules, work additional shifts in factories to recover time and fabricate additional equipment that may be required. Shift work to other locations unaffected by natural disaster.



Risk Mitigation Strategy – Unforeseen Conditions

Risk	Risk Mitigation Strategy
Site Conditions	Equipment conditions should be inspected to the best extent possible. Assumptions as to wear of certain components should be conservative. Work additional shifts at site to account for unforeseen unit conditions.
Facility Closings	Discussions with vendors must occur early regarding any foreseeable issues at their facilities. When not advised, contingency and recovery plans will be worked on immediately. Additional factory locations must be identified to continue work.
Facility Fires	Recovery schedule must be worked on immediately.



Crack on Lower Facing Plate



Stay Ring O-Ring Groove Deteriorated Condition



GSU #4 JSHP Stop Work Order Plant Accident 2/14/12

Risk Mitigation Strategy – Environmental

Risk	Risk Mitigation Strategy
Lead	All paint is assumed to contain lead and OSHA standards are required to be followed. New “lead free” paint is allowed to contain lead.
Asbestos	Perform Additional Testing as required, vendor code interpretations Request, maintain and update HASPs from Vendors Work with Stakeholders to Identify Possible ACM, PCBs and Lead
PCB's	Testing for PCB's should occur (at the earliest) one year prior to starting work. An abatement plan and disposal plan must be developed. Require vendor HASPs prior to starting work
Silica	Silica in dust created by grinding or cutting operations requires additional containment and ventilation

Risk Mitigation Strategy – Resources

Risk	Risk Mitigation Strategy	
Man Power	Engage additional contractors/consultants (QA, Engineers, Environmental) To provide progress reporting, inspections, acceptance testing, expediting.	
Support Locations	Overseas Support China Korea Brazil Japan Netherlands Slovenia	Local Support (USA / Canada) Permanent Staff Contract Labor



Photos of New & Refurbished Unit LPGP LEM Components



Crown for Third Runner (Slovenia)



Blade Machining for Third Runner (Slovenia)



Wicket Gates for Second Unit (China)



Original Turbine Shaft to be refurbished (Canada)

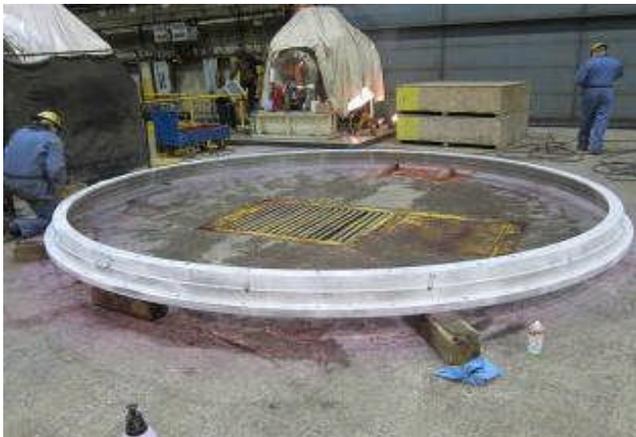
Photos of New Unit LPGP LEM Components



Runner Unit 11 – In Assembly Bay (LPGP)



Outer head cover – Installation (LPGP)



Head cover wear ring – final inspection (Canada)



Inner head cover – Delivered (LPGP)

Photos of New Unit LPGP LEM Components



Unit Control Board – Factory Acceptance Testing (Maine)



Unit Control Board – front view (Maine)