Faraday Repower Project

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Sean Flak, Project Manager
Portland General Electric
Power Supply Engineering

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Faraday Repower Project

- Portland General Electric
- Project Background / Scope
- Economic Decision Process
- Project Management Key Success Factors
- Key Project Milestones
Portland General Electric

Generation Portfolio

- 26.0% Purchased Power
- 16.0% Hydro
- 11.0% Wind and Solar
- 25.0% Natural Gas
- 22.0% Coal

Service Area
- 4,000 Sq Miles
- 860,000 Customers

Hydropower Licenses
- Deschutes River
- Willamette River
- Clackamas River
Project Background / Scope

- Faraday Plant in service since 1907
- FERC License renewed until 2055
- Project Charter: Upgrade or Replace Units 1-5
Economic Decision Process
Invest in Planned Upgrades or Replace Faraday Hydropower Plant?

Avoided Cost Analysis
• Lifetime Maintenance vs Estimated Replacement Cost

Project Feasibility Study
• Replacement Cost Opinion vs Replacement Benefit

Turbine Selection Study
• Francis vs Kaplan Turbine
Avoided Cost Analysis

NPV of Upgrade Costs

Upgrade and Maintain Costs
  • Replace Building/Units/Controls
  • Long Term O&M

Replace NPV Factors
  • Capital Investment
  • Higher Efficiency / Annual Output

Result: Replace Faraday Units 1-5
Feasibility Study

NPV of Design Concepts

- Kleinschmidt / JR Merit Study
- Validate Replacement Decision
- Evaluate Alternatives
  - Alt 1 – Horizontal Francis Units
  - Alt 2 – Vertical Francis Units

Results: 3 Vertical Francis Turbines
Turbine Selection Study

NPV of Turbine Options

Stantec (MWH)
Compare Kaplan v Francis Turbines
Factors
• Equivalent Capital Cost
• Higher Efficiency / Higher MWhrA
• Lower O&M
Results: 2 Vertical Kaplan Turbines
Key Success Factors

**Budget**
- Generation Optimization
- Value Engineering

**Scope**
- Operational Needs vs Wants
- Risk Mitigation

**Schedule**
- License Amendment
- In-Water Work
- Long-Lead Equipment
Project Schedule Milestones

- 30% Design
- Mechanical Equipment Order
- Powerhouse Design Completion
- FERC License Amendment
- General Construction
- Unit Synchronization