Coal to Gas Conversion

Laskin Energy Center
Laskin Plant History

- Constructed in 1950’s to serve the emerging Taconite industry in what is now Hoyt Lakes, MN as the Aurora Steam Electric Plant
- Upgraded from 80 MW to 110 MW in late 1960’s
- Wet Scrubbers installed in early 1970’s
- Renamed after former CEO Syl Laskin in 1976
- Idled during the Taconite mining recession of the 1980’s
- Emerged as a base load resource in the 1990’s
- Major Pollution control upgrade in 2006
Why Convert?

- **Environmental Regulation Pressures**
  - Uncertainty in the timing magnitude and cost of environmental regulations impacting coal-fired facilities
  - Certainty of mercury regulations (MATS)

- **Market Pressures**
  - Comparatively low cost projections of natural gas
  - Uncertainty of future rail transport costs
  - Low off peak and seasonal market electric pricing in the MISO market

- **Opportunities**
  - First natural gas resource for MP (long tradition of firsts)
  - Low up front capital cost in relation to other peaking resources
  - Maintains beneficial market capacity while providing needed peaking energy
  - Maintain important presence in community
Key Project Phases

• Evaluate Unit Performance
• Navigate Regulatory Path
• Design for Changes
• Execute Project
• Plant Transition

Study (2013)
• Permitting
• Pipeline ownership
• Boiler Performance
• Optimize assets
• Organization

Design (2014)
• Pipeline
• Boiler modifications
• Balance of Plant
• Detailed engineering
• Control systems
• Staffing

Construct (2014-2015)
• Determine approach
• Integrate safety and environmental
• Manage quality
• Control costs

Operate
• Training
• Ownership
• Procedures
• Labeling and standardization
• Optimize for peaking
• Support

Natural Gas Conversion
Technical Validation and Study

• Alstom Study
  
  “Alstom’s Primary Recommendation resulting from this engineering evaluation effort is that Minnesota Power and Light could continue with their plans to fire natural gas in Laskin Unit 2 with the planned installation of additional elevations of natural gas nozzles in the windboxes...”
  – Full boiler performance expected

• Additional Studies
  – ID Fans, Scrubber, Chimney
  – Water Balance, Ash Pond Retirement
  – Start time optimization
Navigate Regulatory Path

• **Prudency established in 2013 Integrated Resource Plan**
  – The Laskin Conversion Project was included in EnergyForward and approved as part of Minnesota Power’s 2013 Integrated Resource Plan.

• **Air Permit Major Amendment**
  – Air permit levels for NOx and CO established in Alstom Boiler Study and guaranteed by the equipment supply contact.
  – Permit application was managed by Wenck Associates and Minnesota Power staff.
  – Air Permit became the critical path of project, filed October 2013 and construction approved July 2014

• **MPUC Pipeline Routing Permit**
  – Permit filed in December 2013
  – Route parallels existing transmission corridor, very little impact to public or future development
  – Permit approved

• **NPDES modifications**
Project Execution Strategies

• **Organizational Design**
  – Cross functional team studied the project including required tasks, roles and structure both from a construction and operations viewpoint to establish execution strategies.

• **Physical Construction**
  – Multiple prime contract approach with Minnesota Power as CM
  – Focused on lump sum contracts for construction
  – Staffed with proper experience and mix of skills
  – Bolt-up conversion of burner corners with three levels of gas flame.
  – Associated plant piping, valves and controls.
  – Pipeline construction completed in the fall of 2014
  – Project Controls and Priorities established
  – Boiler and BOP construction in winter/spring of 2015

• **Other Considerations**
  – Boiler and equipment preservation during idle periods.
  – Maintenance strategies on equipment.
  – Learn how the unit will be dispatched and operate.
  – Training, development, preservation of skills.
Plant Transition Strategies

- **Safety**
  - Process Hazard Analysis (PHA) with plant involvement.
  - Update & Training on emergency procedures

- **Environmental**
  - ISO 14001 Environmental Management System (EMS)
  - Understand change in permits

- **Customer Service**
  - Capacity Asset
  - Asset Strategy for lay-up (short-term & long-term)

- **Financial**
  - Coal vs Gas O&M differences

- **Leadership & Staffing**
  - Staffing Level change from 40+ employees to 13 employees.
  - Involve employees that will be staying at the facility in the process!
  - Communicate & educate staff on change of mission for the plant.
Completion

• Start with the end in mind.
  – On Time, On Budget and On Scope
  – Goal of 110 MW Performance
  – Integrate operational procedures and training integrated into the design
• Establish plant support structure and needs.
Questions?