

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**

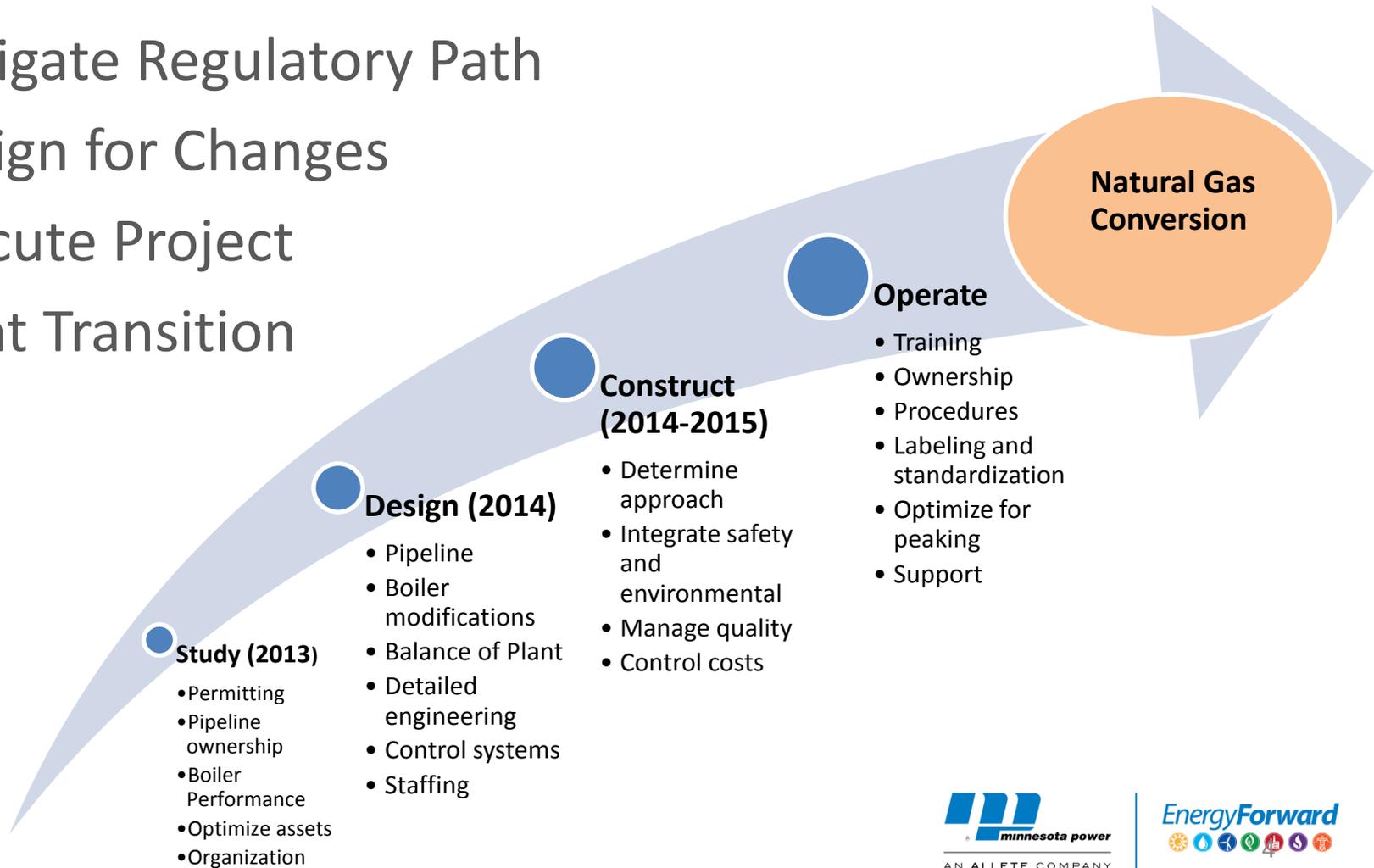
- Comparatively low cost projections of natural gas
- Uncertainty of future rail transport costs
- Low off peak and seasonal market electric pricing in the MISO market

- **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



Technical Validation and Study

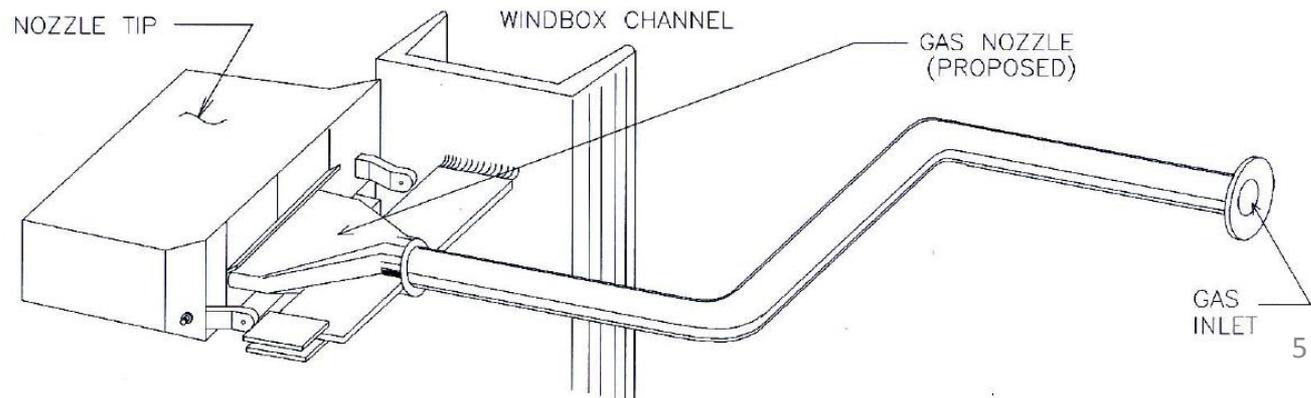
- Alstom Study

“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 Energy*Forward* and approved as part of Minnesota Power's 2013 Integrated Resource Plan.
- **Air Permit Major Amendment**
 - Air permit levels for NO_x 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.

Key Partners

ALSTOM

Honeywell

BURNS & MCDONNELL

HUNT
Electric Corporation

JAMAR



merjent

BARR



TKDA

LAKE SUPERIOR
CONSULTING

LAKEHEAD
constructors inc.

WENCK

Responsive partner. Exceptional outcomes.

minnesota power
AN ALLETE COMPANY

EnergyForward

Questions?