EDWARDSPORT IGCC – MOVING FORWARD

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General Manager – Projects
PROJECT BACKGROUND

- Project Owner – Duke Energy Indiana
- Location – Edwardsport Indiana
- IGCC Technology – GE Energy “Reference Plant” design
- Feasibility Study – 2005
- FEED Study – 2006
- Permitting and Regulatory Processes – 2007
- Design and Construction – 2008 to 2012
- Approved Budget = $2.35B

- The Project is “CO₂ Capture Ready” but capture is not currently in the Project Plan
WHAT A DIFFERENCE A YEAR MAKES – OCTOBER 2008
WHAT A DIFFERENCE A YEAR MAKES – SEPTEMBER 2009
OFF SITE LAYDOWN AREA – SEPTEMBER 2009
POWER BLOCK AREA – SEPTEMBER 2009
CONTROL BUILDING AND WAREHOUSES – SEPTEMBER 2009
AIR SEPARATION UNIT AREA – SEPTEMBER 2009
COOLING TOWER – SEPTEMBER 2009
COAL UNLOADING AND RECLAIM AREAS – SEPTEMBER 2009
## Work Completed by Quantity vs. Budget

<table>
<thead>
<tr>
<th></th>
<th>Quantity Completed</th>
<th>Current Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavation</td>
<td>1,454,000 CY</td>
<td>1,600,000 CY</td>
</tr>
<tr>
<td>Back Fill</td>
<td>923,000 CY</td>
<td>1,496,500 CY</td>
</tr>
<tr>
<td>Piling</td>
<td>2,385 each</td>
<td>2,597 each</td>
</tr>
<tr>
<td>Concrete</td>
<td>56,400 CY</td>
<td>136,000 CY</td>
</tr>
<tr>
<td>Structural Steel</td>
<td>32 Tons</td>
<td>18,000 Tons</td>
</tr>
<tr>
<td>Underground Pipe</td>
<td>83,500 L-ft.</td>
<td>109,000 L-ft.</td>
</tr>
<tr>
<td>Aboveground Pipe</td>
<td>0</td>
<td>462,000 L-ft.</td>
</tr>
<tr>
<td>Equipment to Set</td>
<td>261 each</td>
<td>1,666 each</td>
</tr>
<tr>
<td>Electrical Cable</td>
<td>74,655 L-ft.</td>
<td>3,666,000 L-ft.</td>
</tr>
</tbody>
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ENGINEERING IS 85% COMPLETE – WHAT DID WE LEARN?

- Major equipment count remained stable during detail design cycle, associated bulk material counts increased significantly
- Design development type scope creep due to complexity of integration, i.e. CO₂ compressor, gas turbine fuel skid
- Realization that Edwardsport design is truly a first of a kind, not two (2) times Polk
- GE project engineering organization improved execution efficiency as compared to FEED phase – GE’s gasification organization has evolved and matured significantly over past four (4) years, this will be an advantage to following projects
GREY WATER SURPRISE

- Waste stream during FEED was non-hazardous
- Planned to use deep well injection
- In 2007, the waste stream was projected to be hazardous.

- Bevill Exemption for wastewater from gasification
- Hazardous Waste Permitting vs. Project Schedule
SWITCH TO EVAPORATION AND CRYSTALIZATION

- October 2008 - began discussion with EPA on Bevill Exemption
- March 2009 – Decision to pursue alternatives with Burns and McDonnell
  - May – Met with potential vendors
  - June – Selected vendor
  - July – Contract Signed

- Veolia HPD providing process design and proprietary equipment
- Burns & McDonnell providing engineering services for system integration
- Duke Energy Project Team managing the Construction
As of September 1, 2009:
Overall Project Progress = 40%
Engineering = 85%
Construction = 26%

First Fire CTG#1
May 2011

Substantial Completion
June 2012
PREPARATION FOR OPERATION

- Developing operating procedures

- Operator training program
  - Classroom
  - Field
  - Simulator

- Maintenance planning
  - Equipment documentation

- Practical and technical learning from current operators

- Re-evaluating manning levels and skill needs
Carbon Capture and Sequestration at Edwardsport IGCC Plant

- FEED study for carbon capture underway

- Filed $121 m request with IURC for detailed characterization of storage site that included:
  - Deep saline aquifers
  - Depleted oil or gas fields
  - Enhanced oil recovery

- Retained Schlumberger Carbon Services to begin working on site assessment for deep saline sequestration in Edwardsport IGCC vicinity

- Submitted DOE Clean Coal Power Initiative Round 3 application
Questions?