

Reinhold Environmental Ltd.



2006 APC Round Table & Expo Presentation

July 16-18, 2006, Columbus, OH

All presentations posted on this website are copyrighted by Reinhold Environmental, Ltd (RE). Any unauthorized downloading, attempts to modify or to incorporate into other presentations, link to other websites, or obtain copies for any other uses than the training of attendees to RE's Conferences is expressly prohibited, unless approved in writing by RE or the original presenter. RE does not assume any liability for the accuracy or contents of any materials contained in this library which were presented and/or created by persons who were not employees of RE.



How to Have a Successful Rebuild or Replacement

By Scott Williams

The Definition of a Successful Project

- Completed On Time
- Completed on Budget
- Meet all Guarantees
- Good Quality Work
- Safety



The Basics



- Understand that the majority of the success of a project is determined before the construction ever starts
- A clear and complete definition of the scope is required
- Enough Time
- Enough Money
- A good relationship with the Contractor

Step 1- Figure Out What the Owner Wants



- What coals will be burned?
- What are the Possible Equipment Configurations?
- What are the Physical Site Limitations?
- What are the Environmental Parameters?
- What are the important combustion system parameters?
 - Gas Flow
 - Flue Gas Temperature
 - LOI
 - Etc
- Describe the combustion process in great detail

Recommendations



- Model the conditions to determine the size of the required Particulate Control Device to Verify the Bids
- Often there are many “subprojects” within a larger project. These are where some of the problems arise due to less attention. Provide focus on these areas

Possible Problem Project Areas



- Additional Transformers and Switchgear required
- Ash System Modifications
- Compressed Air
- Control Room Climate Control
- Demolition
- Asbestos Insulation Removal

Step 2-Do a Equipment Construction Study

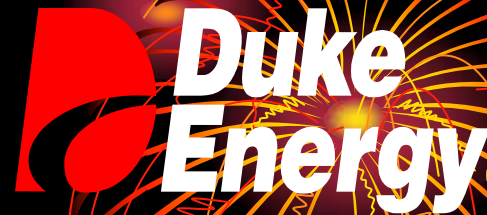


- Determine If the identified options will fit in the area available
- Identify construction issues up front
 - Crane Placement
 - Material Logistics
 - Duration of Construction
 - Shorten Outages but do not be unrealistic-
Outage time is valuable
 - Move all Work outside an outage possible

Step 3- Write a Detailed Specification



- Identify the possible options
- Identify all the equipment preferences
 - Number of T/R sets and Controllers
 - Casing Material
 - Electrical Interface Issues
 - Structural Requirements
 - Performance Requirements
 - Rapper type
 - Plate Type, material, thickness
 - Etc.



- No detail is too small (Small details are big dollars on big projects)
- Do not assume you will get what you want if the item is not written down
- Provide "teeth" in the specification but also provide incentive to do well
- Staffing is important- Specify Bidder staffing requirements, and have the right of approval of all successful Bidder supplied staff



- The Owner must decide what is important...
- -Schedule
- -Cost
- -Quality
- ...and craft the specification to achieve the desired results

Step 4- Screen Your Bidders



- Identify Potential Bidders
- Visit all Potential Bidders offices
- Get References and Check them
- Check Bidder Finances
- Check Bidder Technical Qualifications
- Finally, Eliminate all unacceptable bidders
- Meet the people that "actually do the work"
- Make sure there is adequate bidder staffing available

Step 5-Issue the Specification



- Ask for detailed cost, in a standard format from all bidders
- Be prepared to answer both technical and commercial questions
- Allow sufficient time for a good bid- 8-10 weeks
- Invite all bidders to the site to “look around”

Step 6- Evaluate the Bids



- Determine the evaluation criteria and stick to it
- Typically, let 3-5 people perform the bid evaluation to avoid conflicts of interest
- Ask for Clarification on the bids if required

Step 7- Award the Bid and Start the Design



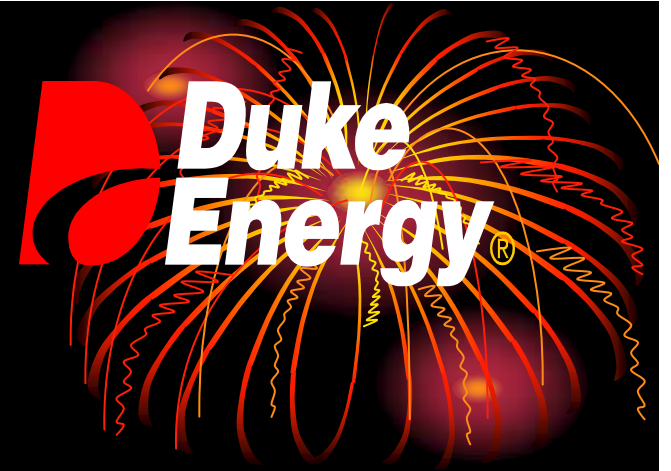
- Be involved during the Design Process
- Establish a Design Review Team- Civil, Electrical, Controls, Precipitator- Hire the right people with the right expertise as needed.

Step 8- Mobilize and Start Construction



- Require the successful bidder to have the right expertise on site to do the job. This include management and craft
- Require the proper facilities on site
- Require the successful bidder to provide Safety and QA oversight for all phases of the project

Step 9- Verification by Owner



- Make sure the "Owner" has people on site to verify all work is done properly
- All Owner representatives should be qualified in particular areas of expertise
- Electrical, Controls, Steel Erection, Construction Management, Financial Management, Safety Professional

Step 10- Sign Off

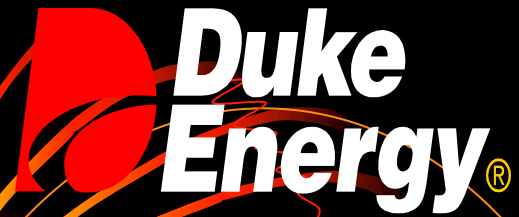


- All required inspections and documentation should be identified in the specification and abided by
- Review the specification to make sure all items in the spec have been provided
- Generate a "punchlist" and visually verify all items are completed properly.

Step 11- Get Ready for Startup



- Requirements for Startup should be identified in the specification
- Verification by both the Owner and Contractor should be performed



Construction Pictures of a Duke Energy ESP under Construction

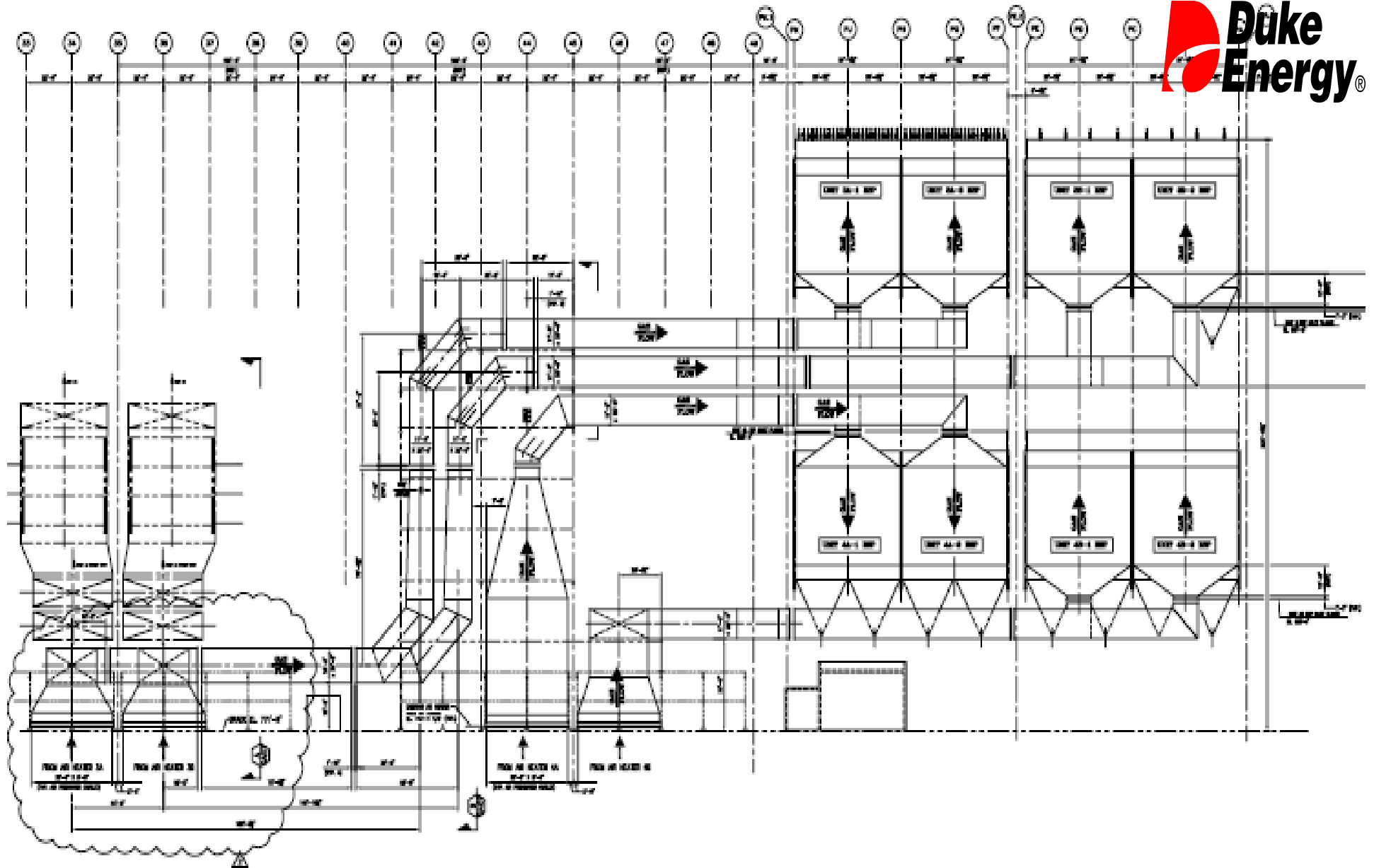
Project Statistics



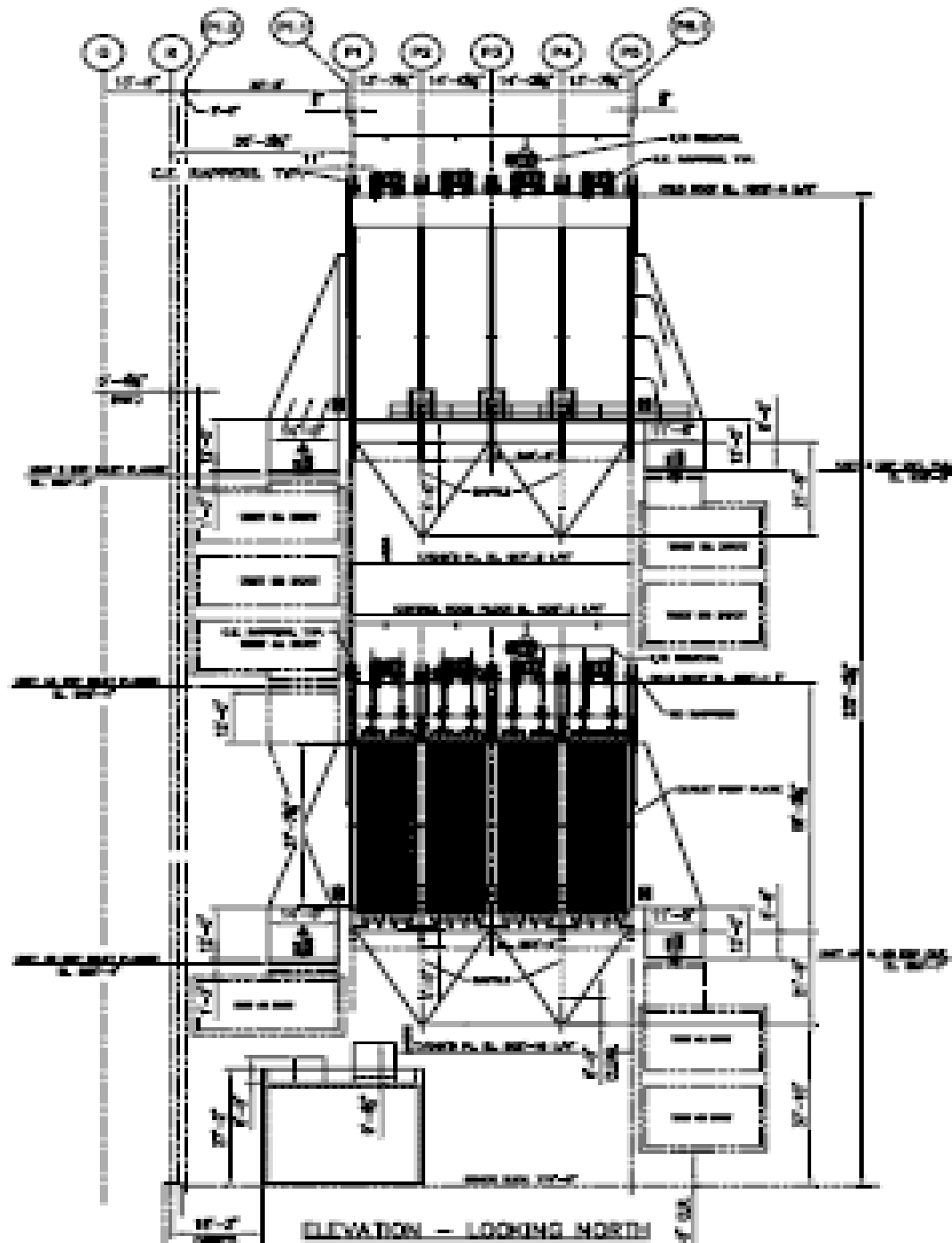
- 3500 tons of ductwork
- 3500 tons of structural steel
- 25,000 manhours of engineering
- 1500 tons of concrete
- ESP Structure is 220 feet high and 210 feet wide



- 16 Mechanical Fields
- 64 Electrical Fields
- 41' high plates
- 48' deep
- 12" plate spacing
- 320 SCA



M.E.T. ELEVATION - LOOKING EAST FROM CO. LINE "C"



Duke Energy





2006 8 30







DUKE POWER COMPANY





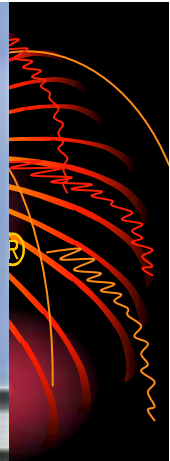
 **Duke
Energy®**





 **Duke
Energy**®





2006. 2. 15

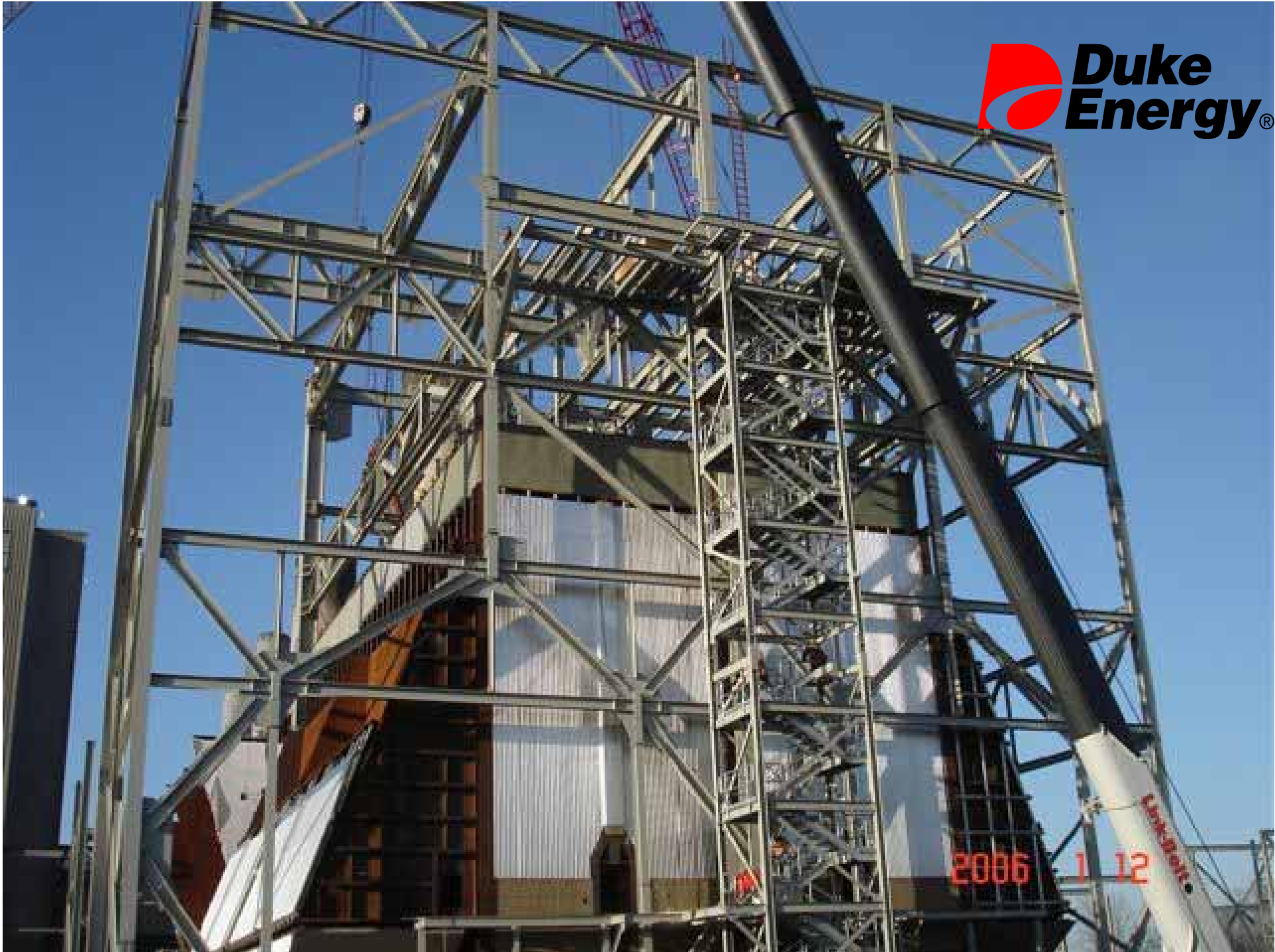




2005 11 9



05/01/2006





2006 3 27



28/03/2006



12/01/2006



28/03/2006





 **Duke
Energy®**





2006 2 16







16/03/2006



2006 2 1

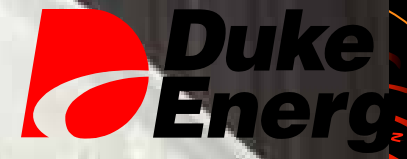




2006 2 16

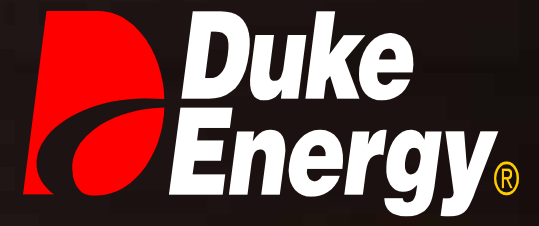
**Duke
Energy**





2006 2 2





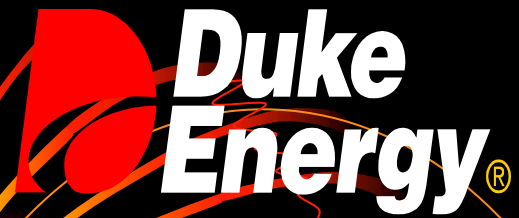
2006 4 21







2006 8 30



Expect to deal with issues
that no one has thought
of...



Plan, Plan, Plan, Plan, Plan,
then Plan some More
and Think Ahead