



***Building a knowledge base*** for ongoing operation around  
the power island

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*October 23, 2008*

# Knowledge Management

**Knowledge Management (KM)** comprises a range of *practices* used in an organization to *identify, create, represent, distribute and enable adoption* of what it knows, and how it knows it.

Knowledge Management programs are typically tied to organizational objectives such as *improved performance, competitive advantage, innovation, developmental processes, lessons learned transfer* (for example between projects) and the general development of collaborative practices..

➤ Annual Report Card – Reports on status of site management issues.

- People Safety
- Management Controls
- Operations
- Maintenance
- Plant Optimization/Reliability
- Purchasing/Supply chain
- Environmental Issues

➤ Lesson Learned Transfer: Incident tracking

- What happened? What is the Root cause? What are the corrective actions? Can this happen at your site? Web based notifications, staff meeting reviews, multi-site review team.
- E-mail notifications
- Response monitoring

GREEN = COMPLETED	PRIORITY	Site
YELLOW = IN PROGRESS		
RED = NOT STARTED		
N/A = NOT APPLICABLE		
Item	1= High	
<b>PEOPLE</b>		
Manager's personnel expectations	1	
Site security issues	2	
Good business practices	2	
Customer Communications	1	
MARC Training	2	0
KT Training	2	
Certified Project Managers	3	0
Certified Energy Manager (CEM)	3	0
Fundamentals testing	2	
<b>SAFETY</b>		
Monthly safety meetings	1	
Safety tours	1	
Safety Programs	1	0
Job briefings	1	0
Safety equipment	1	0
MSDS	1	
Action plans	1	
<b>MANAGEMENT CONTROLS</b>		
Overtime policy	3	
Vacation policy	3	
Shift schedules	3	
Emergency Action Plan	1	0
Review of Company policies	2	
Develop Staff Job Duties	2	
MBA Essentials Certificate or MBA	3	0
Super Scout Training	2	
Incident Tracking Reports	1	0
Cinergy Contact procedure	1	
<b>OPERATIONS</b>		
Operational procedures	3	
Load shedding procedure	3	
CEMS reporting		N/A
Daily logs	2	
Daily reports	1	0
Operations board updated		N/A
Lockout - Tagout - Clearance	1	
Alarm disable review		N/A
FFTs	2	
Emergency Action Plans	2	
Jumper/Lifted Lead Procedure	1	

**Learn from incidents by recording and communicating to others**

- SHARING with other sites and parent organization
  - Turbine, boiler, maintenance planning, efficiency testing
  - Prime movers meetings
  - Monthly Chemistry Conference Calls
  - Monthly Maximo Conference Calls
  - Environmental Liaison meetings
  - Commodity information
  - Emergency Preparedness
    - Hurricanes, Tornados



# Measure, Monitor, Trend Analysis

- **Efficiencies**
  - Boilers, Chillers, Turbines
    - Boiler Tuning - Excess Air, Emissions
    - Loss of Ignition
    - Partial load
- **Behavior modification for users**
- **Interactive cost signals**
- **Fuel type usage**
  - Reduction of high cost fuels
- **Emergency Preparations**
  - Hurricanes
  - Blackouts
- **Global Climate Change legislation**
  - Offset capabilities
  - Reduction of liabilities

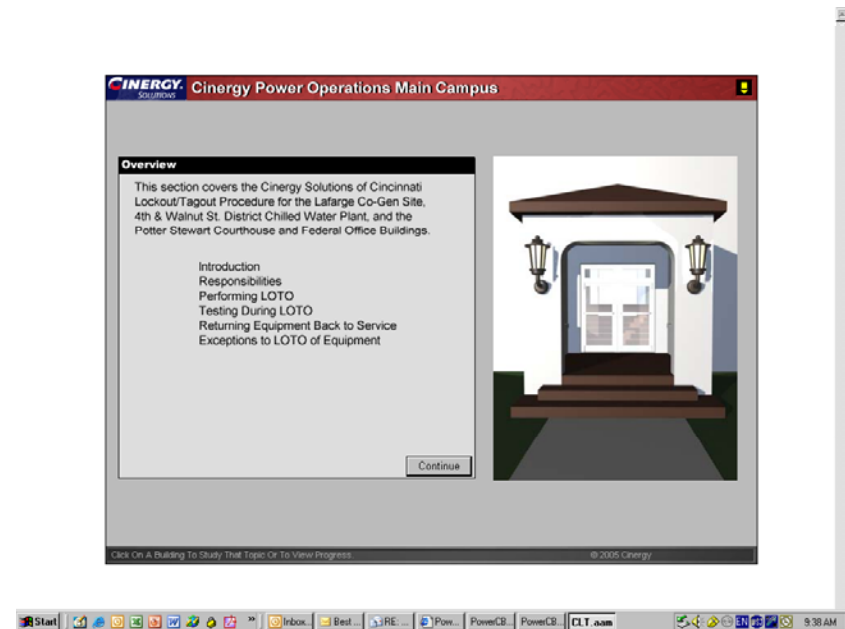


## ➤ Audits

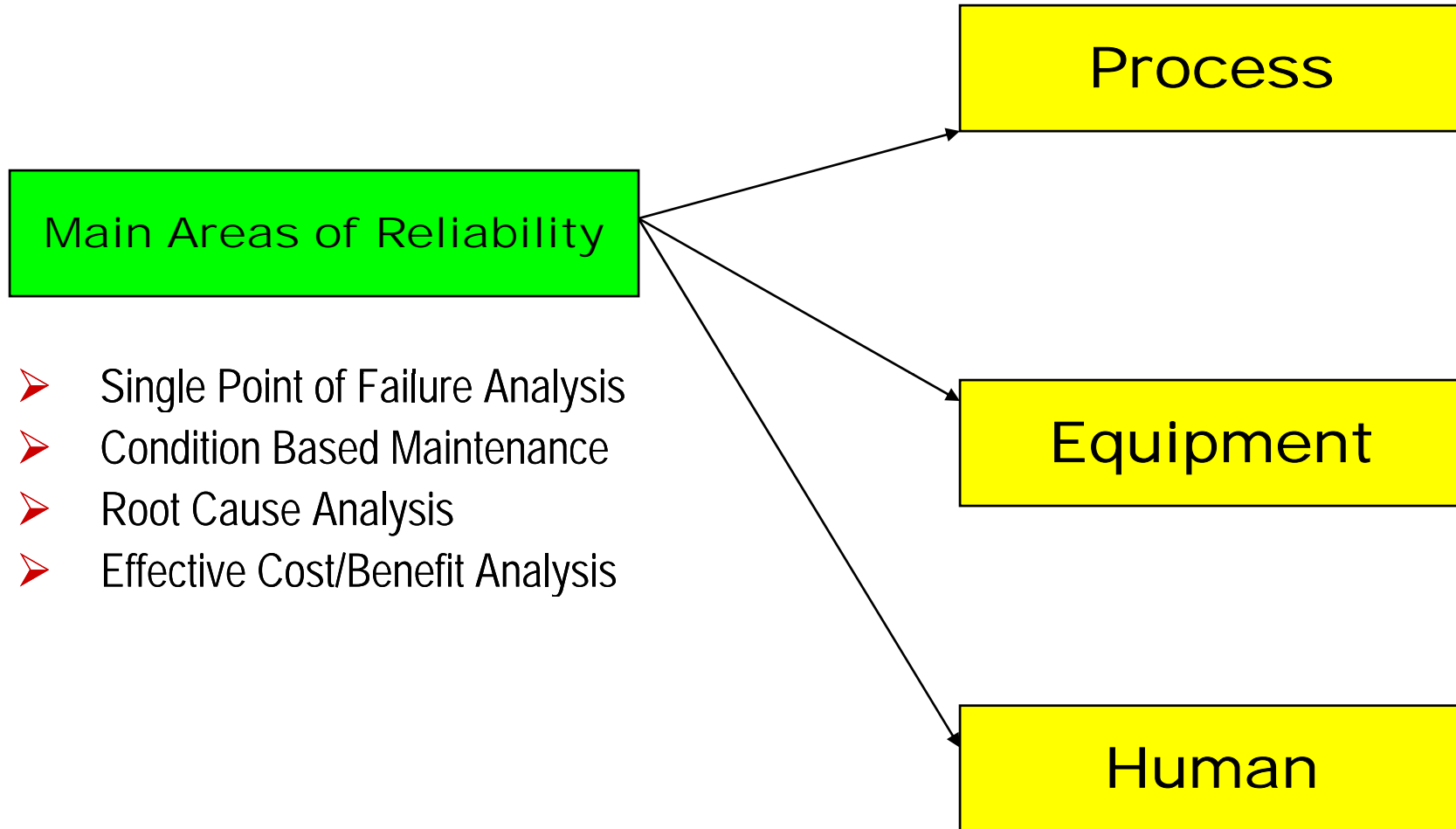
- Third Party Environmental & Safety Audits
  - Air
  - Water
  - Safety
  - Others
  - Training
- Prioritization of Findings
- Remedies
- Follow Progress Report
- Executive level reports
- Managed by legal department

## ➤ Lock-out-Tag-out Audits

- Managers from other sites

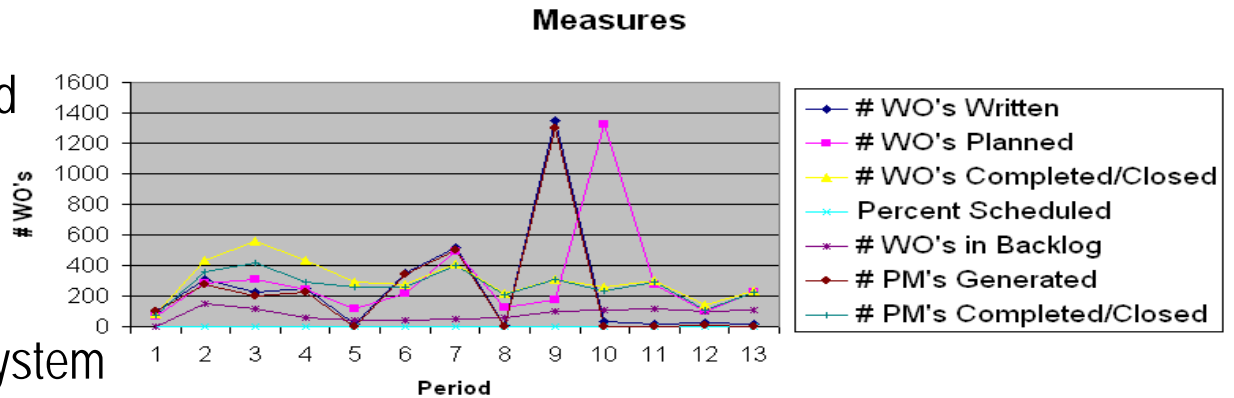


OSHA compliance training  
Computer Based Training



# Work Process Utilization

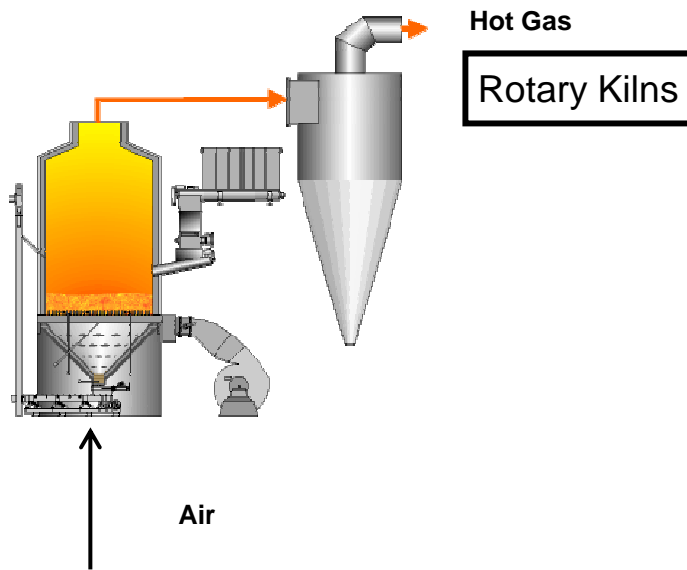
- Outage and Major Overhaul Planning/Scheduling
- Full Functional Testing and Verification
  - Electric Systems
  - Mechanical Systems
  - Logic and Controls System



Power 4					
Description	Equipment	Test Type	Frequency	Last Compl	Maximo PM #
GTG-410 Combustion Trouble	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
Lube Oil Press - Low/Pre Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Hydraulic Oil Press - Low/Pre Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Exhaust Frame Cooling Pressure Low	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Turbine Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Generator Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Seal Oil ?DP - Low/Pre Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Exhaust Gas Temp - High/Pre Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Lube Oil Temp - High/Pre Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
GTG-410 Thrust Position - High/Pre Trip	# 410 GTG	Full Functional	Hot Gas Path/ Major Overhaul Inspection	Jan-02	TEX8843
Mechanical Overspeed Trip	# 410 GTG	Full Functional	One year not to exceed scheduled TAR	Jan-02	TEX8843
Electric Overspeed Trip	# 410 GTG	Full Functional	One year not to exceed scheduled TAR	Jan-02	TEX8843



# Biomass Gasification - Low BTU gas



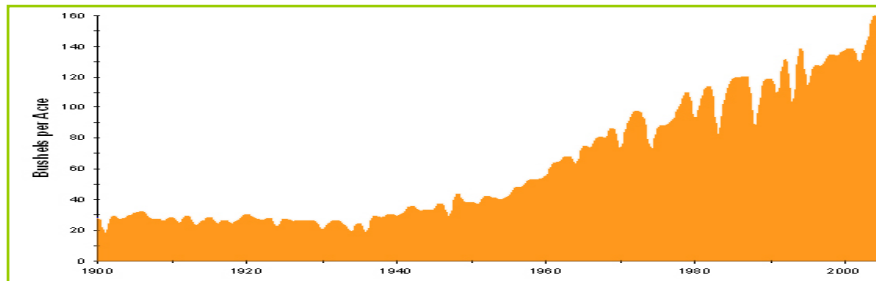
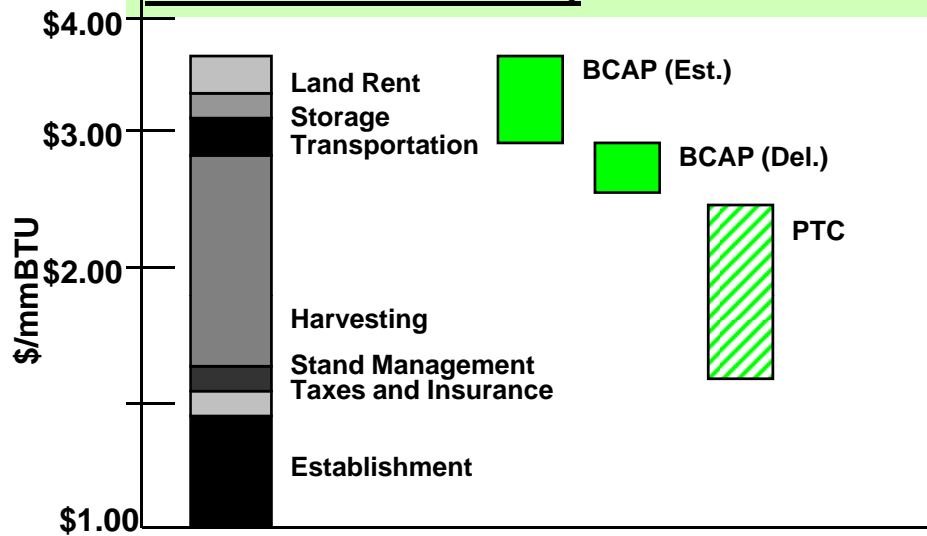
- Application
  - Natural Gas replacement for boilers
  - Substitute Natural Gas drying systems
  - Low NOx Reduction Systems

- Fluidized Bed Gasifier
  - Mature Technology
  - Gas clean systems may need verification
- Biomass converted to Low BTU gas
  - 100 – 200 Btu/cu ft
- Used with boiler, kiln, gas turbine or other energy load
- Fluidizing medium is usually air (and steam)
- Emission reductions
- Uses up to 55 percent moisture and ash content in excess of 25%
- Use of dry sludge minimizes CO<sub>2</sub> from trucking to disposal site

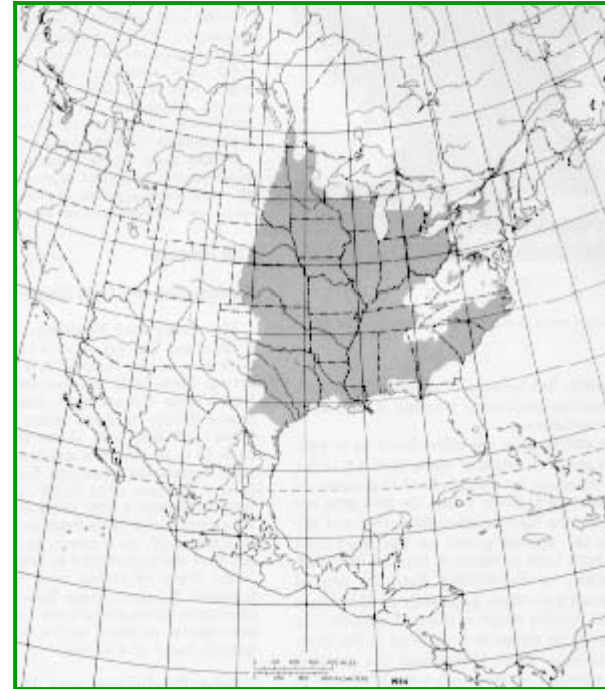
**80% Reduction in CO<sub>2</sub> emitted when compared to Natural Gas**

# Sustainable Energy Crops

## Illustrative Fuel Price (Costs + Return - Incentives)



Potential yield improvements...



**Cottonwoods**