

# ***Results of Power Plant Silica Exposure Project***

EEI Industrial Hygiene Committee

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Presented by

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# Silica Project Team

- Industrial Hygiene Work Group
  - Thomas F. Frank, Ameren Corp. - Chair
  - John B. Bavin, Consumers Energy
  - James G. Gartland, Duke Energy
  - Charles D. Lane, Jr., Southern Company
  - Paul J. Webb, National Grid

# Project Objectives

- Identify tasks unique to power plants where silica exposure occurs.
- Compile air sampling and other data to characterize silica exposure for these tasks.
- Support EEI and OSHA to produce a standard that accurately addresses silica risk in the electric utility industry.

# Silica Project Benefits

- EEI member access to silica data
- Standardize protective measures for coal and fly ash operations
- Competently represent EEI member companies during OSHA rule-making
- Foster a collaborative working relationship with OSHA

# OSHA Silica Actions

- National Emphasis Program – January 24, 2008
  - Coal, fly ash, or power generation was not specifically referenced in the NEP.
- Pre-Rule Notice Occupational Exposure to Silica, Spring, 2009
  - Peer Review of Health Effects and Risk Assessment: June, 2009 deadline

# OSHA's Key Silica Priorities

- Establish new PEL based on current ACGIH TLV
- Medical Monitoring Requirement
- Training Requirement

# Current and Future Silica PELs

- Current PEL (based on the % silica)
  - The higher the Silica % , the lower the PEL
  - Values expressed in micrograms ( $\mu\text{g}$ ) for this discussion

$$\frac{10,000 \mu\text{g}/\text{m}^3}{(\% \text{ Silica} + 2)}$$

**98  $\mu\text{g}/\text{m}^3$  or higher**

- Proposed PEL: **25  $\mu\text{g}/\text{m}^3$** 
  - Expect new PEL to be based on Current ACGIH TLV
  - Expect Action Limit to be  $\frac{1}{2}$  of PEL: 12.5  $\mu\text{g}/\text{m}^3$

# OSHA's Coal & Respirable Dust PELs

- Two PELs based on % Silica in Coal
  - < 5% silica - 2.4 mg/m<sup>3</sup>
  - ≥ 5% silica – (Use Silica PEL formula)
- Coal dust PEL range (based on silica content): 0.098 – 2.4 mg/m<sup>3</sup>
- Respirable Dust PEL: 5.0 mg/m<sup>3</sup>

# Major Coal Types

## ➤ Bituminous

- 45-86% carbon;
- Quartz content: 0.3-10%
- Higher exposures to silica

## ➤ Sub-Bituminous

- 35-45% carbon;
- Quartz content: 0.4-3.1%
- Higher exposures to metals (hexavalent chromium)

Source: “Exposures to coal fly ash during maintenance of air cleaning devices in power plants.” Beaulieu, Siert, and Woods. AIHCE presentation, 2006.

# Coal and Fly Ash Tasks

- Daily Coal Plant Operator Rounds
- Coal Plant Laborer Activities
- Coal Plant General Housekeeping
- Housekeeping in Coal Handling
- Coal Pile Equipment Operations
- Precipitator and Bag house Maintenance
- Coal Bunker Maintenance
- Coal Mill Maintenance

# About the Data

- Respirable dust and silica data comes from member companies
- Data is kept confidential
- Data is pooled and summarized into similar exposure groups
- Member companies complete survey form and e-mail back to [paul.webb@us.ngrid.com](mailto:paul.webb@us.ngrid.com)



# Data Collection: The Survey Request

- Analytical and Sampling Method
- Silica Source
- Task Description, Duration, and Frequency
- Sampling Conditions
- Hazard Control and PPE
- Sample Results

# Results

- Results are compared to 25  $\mu\text{g}/\text{m}^3$  PEL (expected silica PEL)
- Results are limited to coal and fly ash handling tasks
- 94 separate sample results to date
- Bag house maintenance data (from Xcel Energy study)

# Results – High Risk Tasks

- Bag House and Precipitator Maintenance
  - Based on Xcel Energy study (2006)
  - Data from 8 coal-fired power plants
  - Data from 1,036 8-hr TWA s
  - 10 years of data from 1996-2006
- Majority of samples in excess of silica PEL

# Low Risk Exposures

Routine coal and fly ash handling such as:

- Manicuring coal pile
- Operating coal car locomotive
- Control room operators
- Visual inspections – coal processing equipment
- Fly ash disposal

# Summary

- Changes to silica regulation could have a major impact on how coal and fly ash is handled.
- The EEI database of silica samples is the first and necessary step to represent our position.
- The data collected benefits all member EEI companies.

# Contributing Companies

- AEP
- Ameren Corp
- Connectiv
- Entergy
- Xcel Energy (2006 study)

# Going Forward

- We need more participation from member companies.
- December 2009 Deadline for Initial data collection phase.

Questions about this project:  
Tom Frank, Ameren Corp