# Addressing Combustible Dust: Proactive Efforts

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John Sunderland

Buckeye Technologies

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# May, 2010 OSHA unplanned visit to the Foley Plant

Compliance Officer found dust in the Repulping area

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How do you set housekeeping standards with workable direction in meeting OSHA's requirements?

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# Issues

Depth of dust layer

Bulk density of dust

Surface area factors

Frequency and level of housekeeping efforts

Blow down practices

Review of existing vacuum systems

# Resources

Legal: Larry Halprin, Keller and Heckman

Scientific: Vahid Ebadat & Steve Luzik, Chillworth Technology

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In addition to the fire triangle , which has three elements:

1. A fuel
2. An oxidant
3. An ignition source

4. Suspension or mixing of the combustible dust

5. Confinement

# Particle samples were tested for:

- Max. Explosion Pressure Pm(bar)
- Max. Rate of Pressure Rise dP/dt (bar/s)
- Kst (bar.m/s)
- M.I.E. (mJ) (cloud)
- M.I.T. (°C) (cloud)
- M.I.T. (°C) (layer)
- M.E.C ($g/m^3$)

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## ➢Kst (bar.m/s)

Deflagration Index is calculated from the maximum rate of pressure rise and the size of the test sphere. The number is a scaling factor used to predict confined space explosion behavior in different size enclosures.

## ➢M.I.E. (mJ) (cloud)

➢M.I.E. (mJ) (cloud)Minimum dust cloud ignition energy is a value that measures how easily can a suspended dust cloud be ignite d by a low energy source, such a electrostatic sparks.

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# ➢M.I.T. (°C)(cloud)

➢The temperature that a suspended dust cloud will ignite if exposed to a hot surface, typically 500 – 600 °C.

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- M.E.C ($g/m^3$)
- )

- Minimum explosible concentration is the lowest concentration of dispersed dust capable of being ignited and supporting flame propagation.

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Bulk Density :

Dust with bd of 1.5 lb/ft$^3$ = almost 1.5 inches

Dust bd of 3.0 lb/ft$^3$ = ¾ inch

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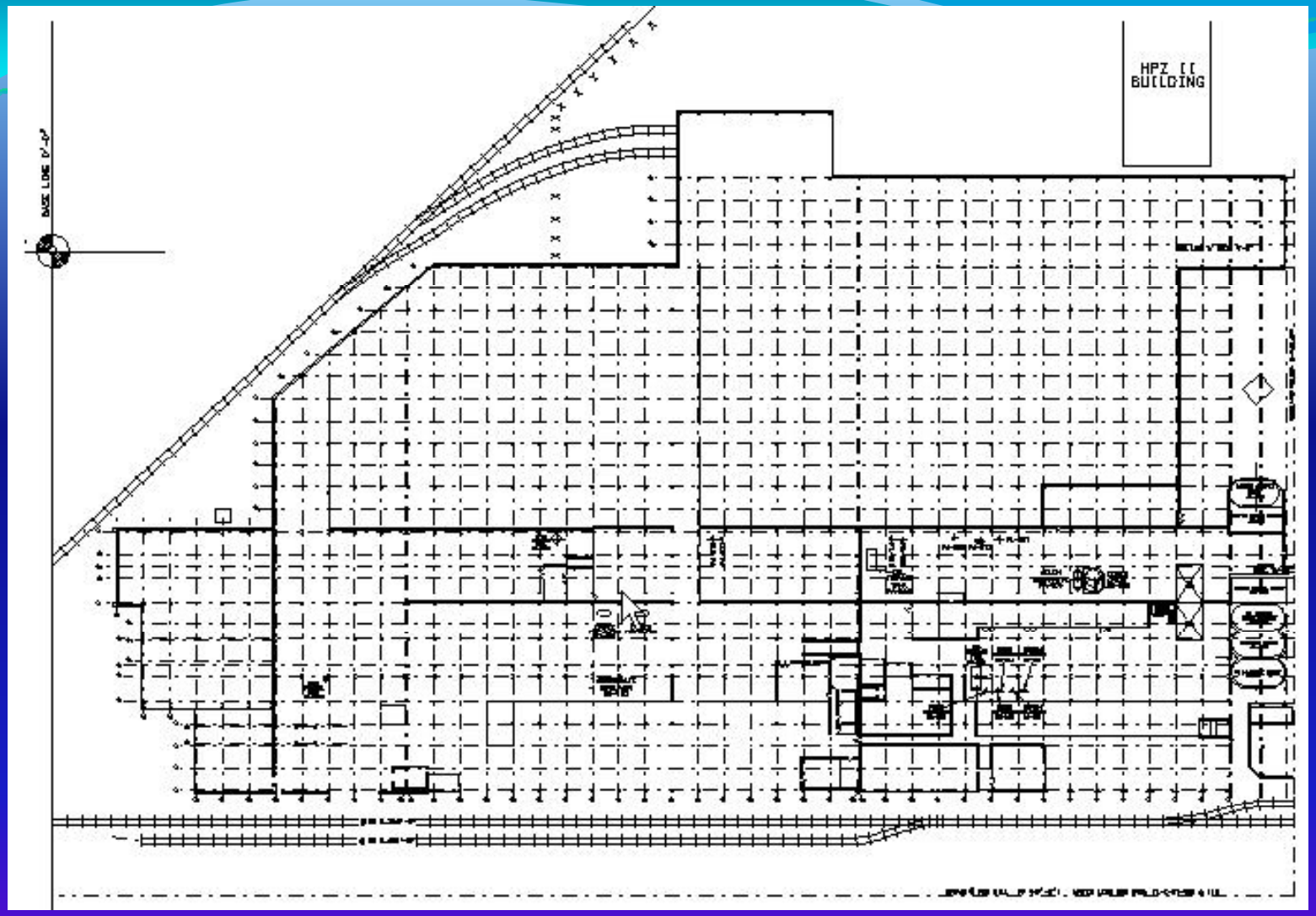


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# Can we actually overheat a motor?

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CAUTION CAUTION CAUTION CAUTION


GROUP 1
2012/02/07 10:47:19
STOP
EVENT
1day
5min/div
1
73
deg f
2
74
deg f
3
73
deg f
4
73
deg f
5
74
deg f
6
73
deg f
09:40
09:50

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# Current Housekeeping


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# Report

Pulp dust layer greater than 1/32 inch

Wood dust layer of 1/8 inch

Housekeeping practices

Vacuum system changes

Utilize NFPA new process for calculating the volume of dust in an area.

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# Next Steps

# Thank you.