

Worldwide Pollution Control Association

WPCA/TVA

Coal & Gas Seminar

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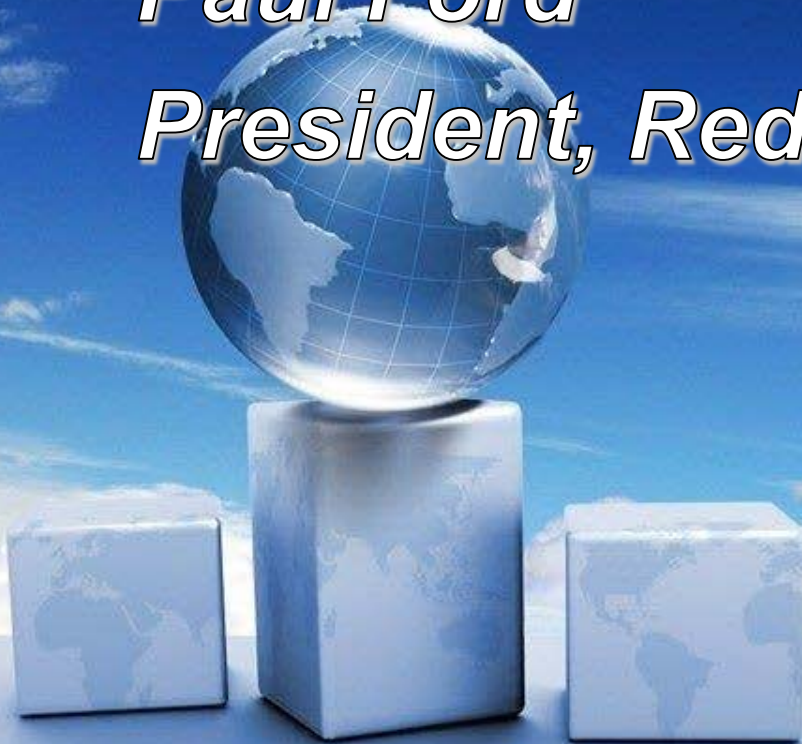
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Load cycling

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Cycling and the Performance Impacts on ESPs

Unfortunately, nothing happens in isolation. Change is rife!

Load Cycling, or as the Precip sees it” frequent Start-ups and Shutdowns”

These frequent changes raise the risk of poor performance and reliability.

It would seem to me that there's no one answer across all plants but that understanding the issues that exist may allow you to cope and implement the best strategies for your particular circumstances.

The most prominent issue is Temperature.

The problems with temperature change manifest themselves in a number of ways and in turn need to be dealt with accordingly

- Thermal transfer
- Acid Dew point
- Particulate size and Agglomeration
- Ash Resistivity

What tools do we have at our disposal to deal with these issues.

Unfortunately – Not too many

- Rapping Strategies
- TR Set Power delivery
- Operations tolerance and understanding
- Design enhancements

Startup and Shutdown - Should the inlet or outlet electrical fields be energized first? Even this somewhat straightforward question does not have a clinical answer

During Startup:

Use aggressive rapping to limit adhesion of damp ash on surfaces

Energize Fields sequentially as needed to meet emission requirements

Delay switching to normal TR and rapper operations as long as possible after gas temperatures are reached.

The longer the down time the longer it will take for the steel temps to rise to the gas temperatures.

The closer the steel temp is to the gas temperature the less likely you are to “gum” up the surfaces.

During Shutdown:

Use aggressive rapping to clean surface while temperatures are still high

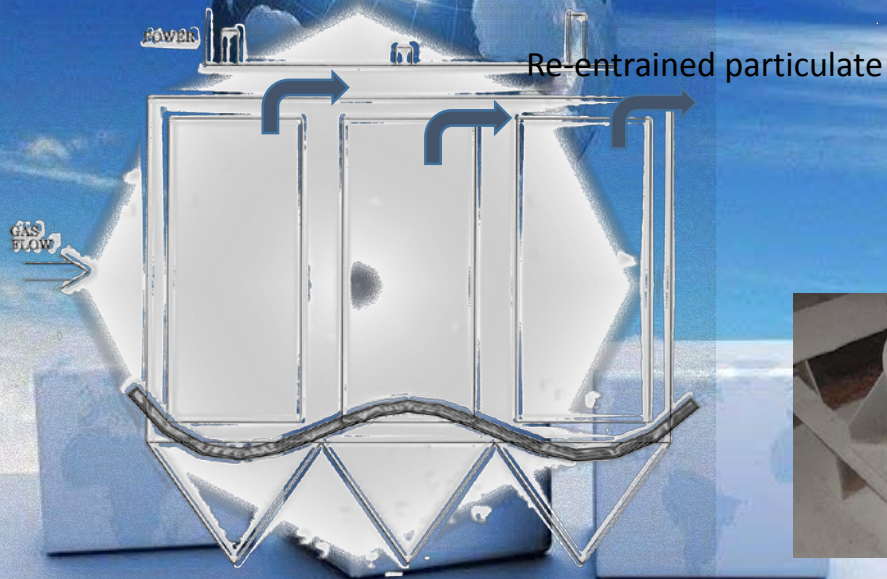
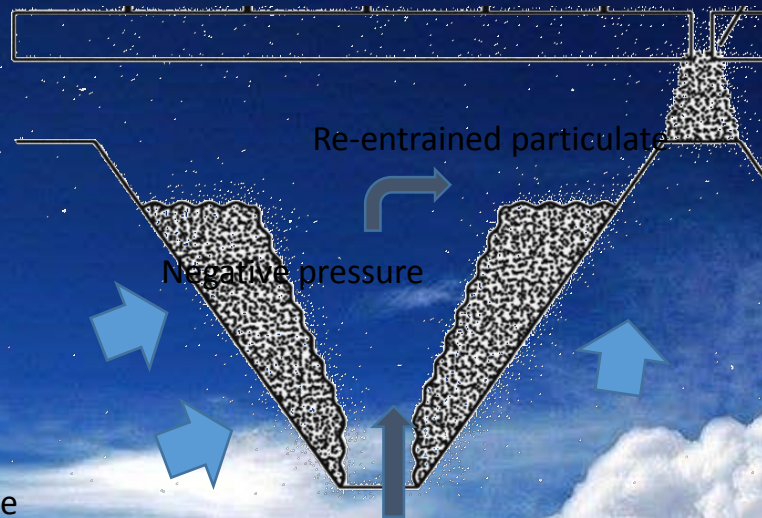
Reduce the power to the fields slowly and sequentially, back to front prior to De-energizing and TR sets. This will minimize spiking.

During Off Cycle:

Keep insulator and hopper heaters energized

Keep rappers and ash evacuation systems running at a reduced frequency. If TRs are still running, use power down rapping.

Thermal Transfer, Insulation and Re-entrainment

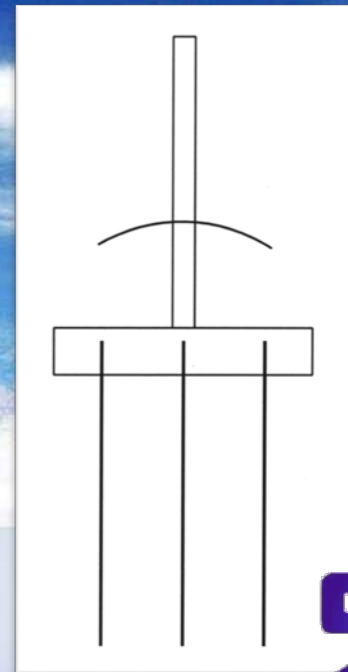
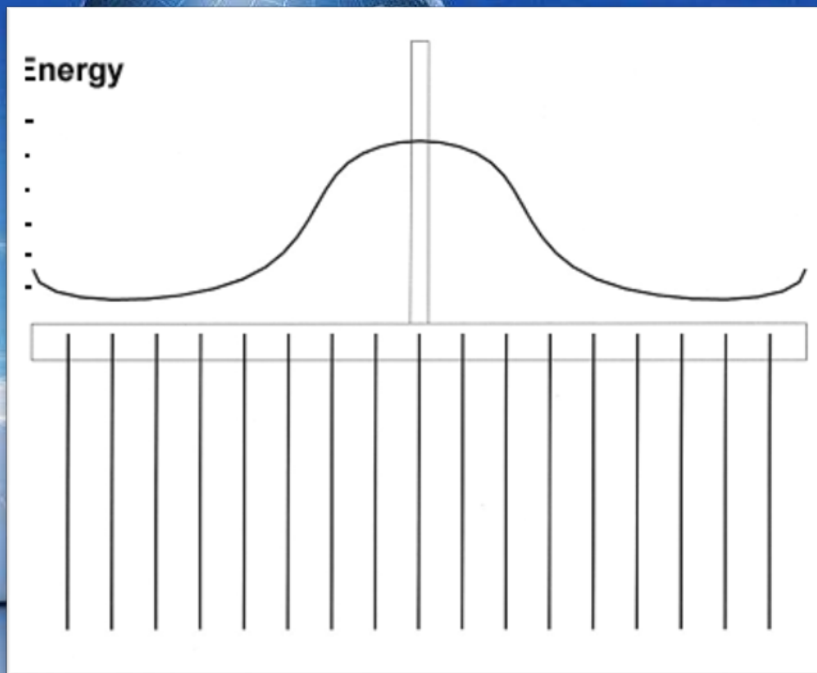


Hopper Cleaning Devices



- Rapping Too Frequently Prevents Agglomeration
 - Results in continuous re-entrainment and elevated opacity/emissions
- Rapping Too Hard Causes Lateral Release
 - Results in spiking/puffing, especially towards the outlet where there is no backup field
- Too High a CE Rapping Density Results in:
 - Clean plates below the point of impact
 - Dirtier plates at the outboard areas
 - Re-entrainment of particulate when rapping energy is increased to keep outboard plates clean

Optimization - Trial and Error – Experience



- Although the precipitator is a rather simple device in terms of the basis of operation, there are numerous factors that can both positively and negatively effect the day to day efficiency.
- Stay aware of what these factors are, understand their effect, and optimize them for best performance.
- There are consultants who have spent their lifetime solving precipitator problems on a daily basis. Don't be shy about asking for help. In the long run it will save you time and money.

