Tips and Tricks for Achieving Optimum Precipitator Performance

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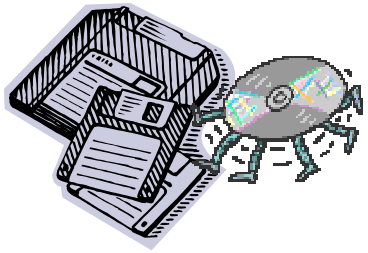
Where Does a DCS Work for You?



- Fulfills the corporate philosophy of long term centralized data storage.

- Essential data is made available to personnel in a plant- wide and common format.

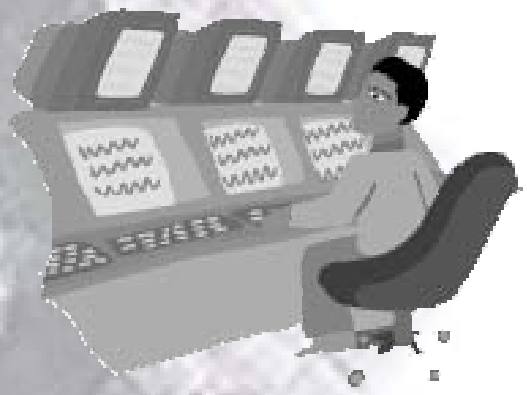
Where Does a DCS Work Against You

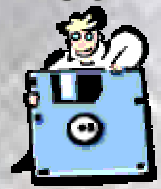
- **The benefit of the control system provider's knowledge is not realized.**

- **Writing purpose specific code for most DCS's is not a straight forward task and attracts significant costs.**

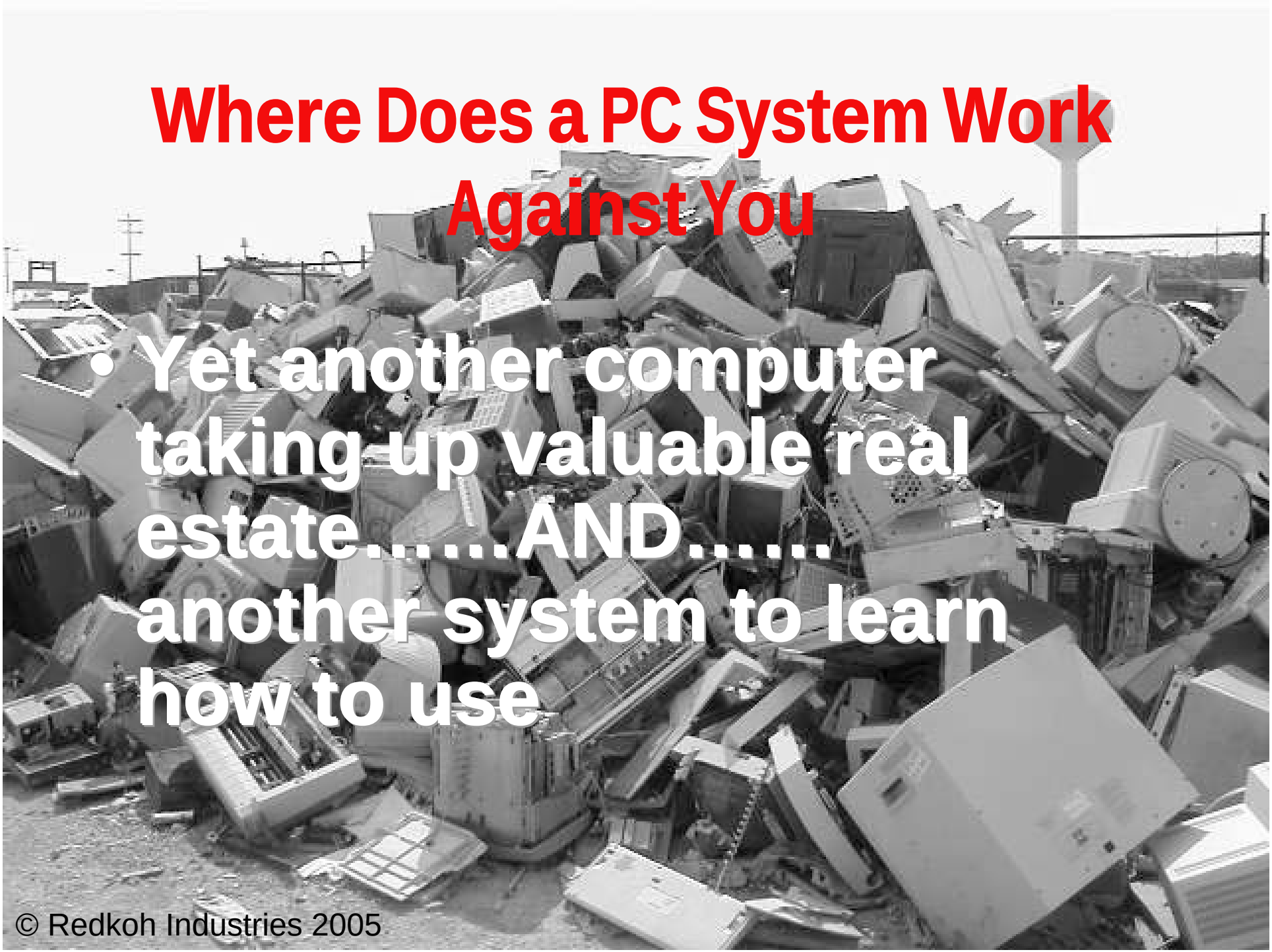
Where Does a PC System Work for You

- **All that thinking, OR!!, At least a good portion of the thinking has been done for you.**
- **Focusing on a problem is easier since you are not sharing a monitor with many others trying to run their parts of the plant.**
- **Its easier to share information with customer support since the storage medium is likely to be portable and the computer may also be internet accessible.**





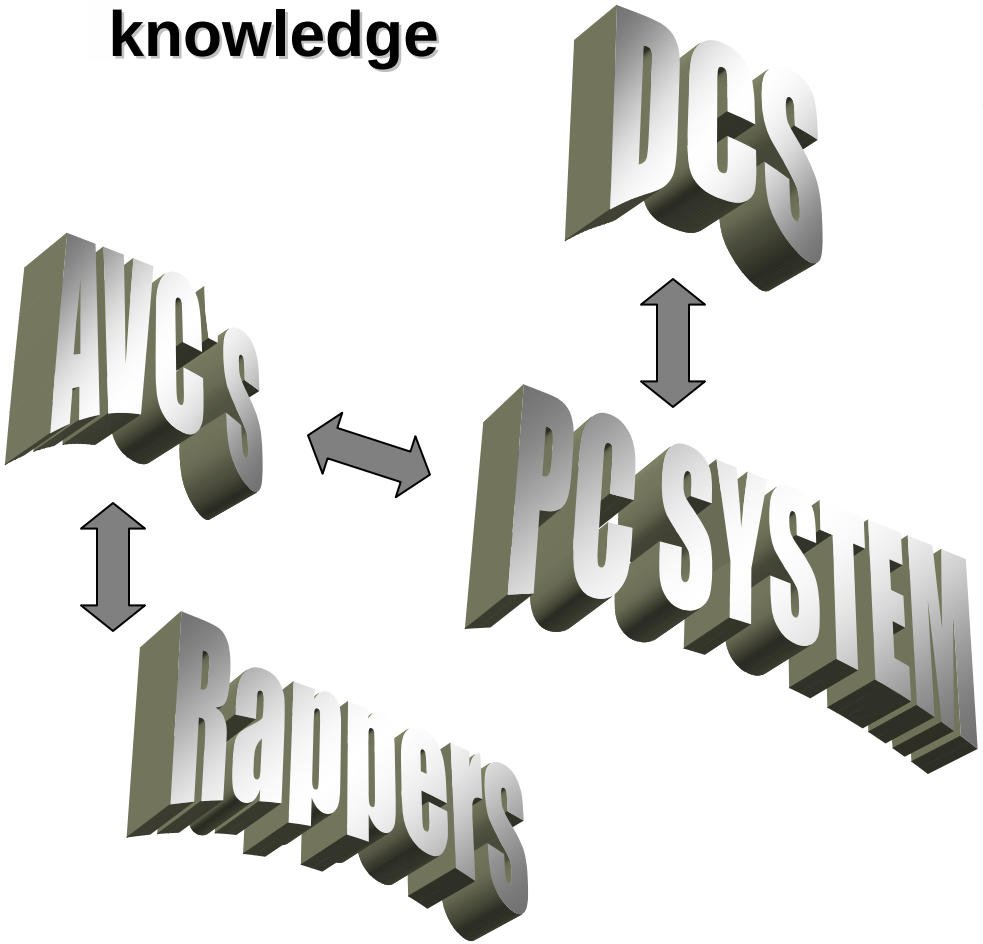
Where Does a PC System Work Against You



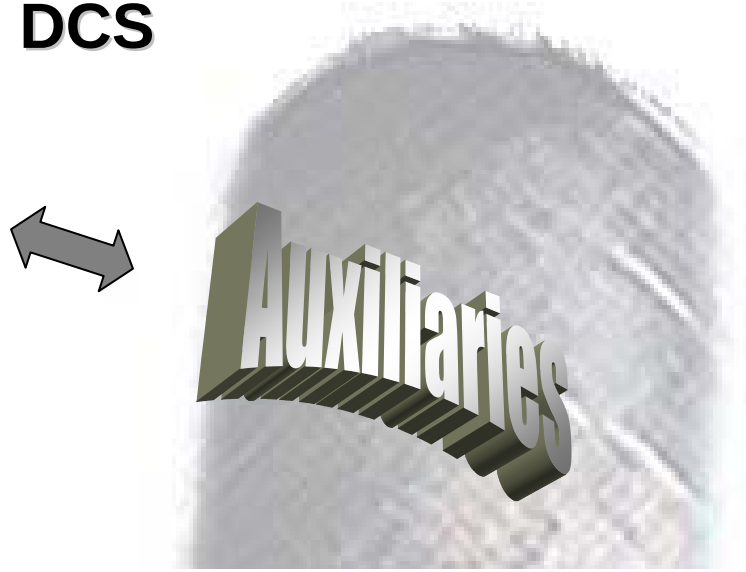
- Yet another computer taking up valuable real estate……AND…… another system to learn how to use

TIP

- **In this world of technology – Get the benefit of both the DCS Interface and the Controls suppliers knowledge**



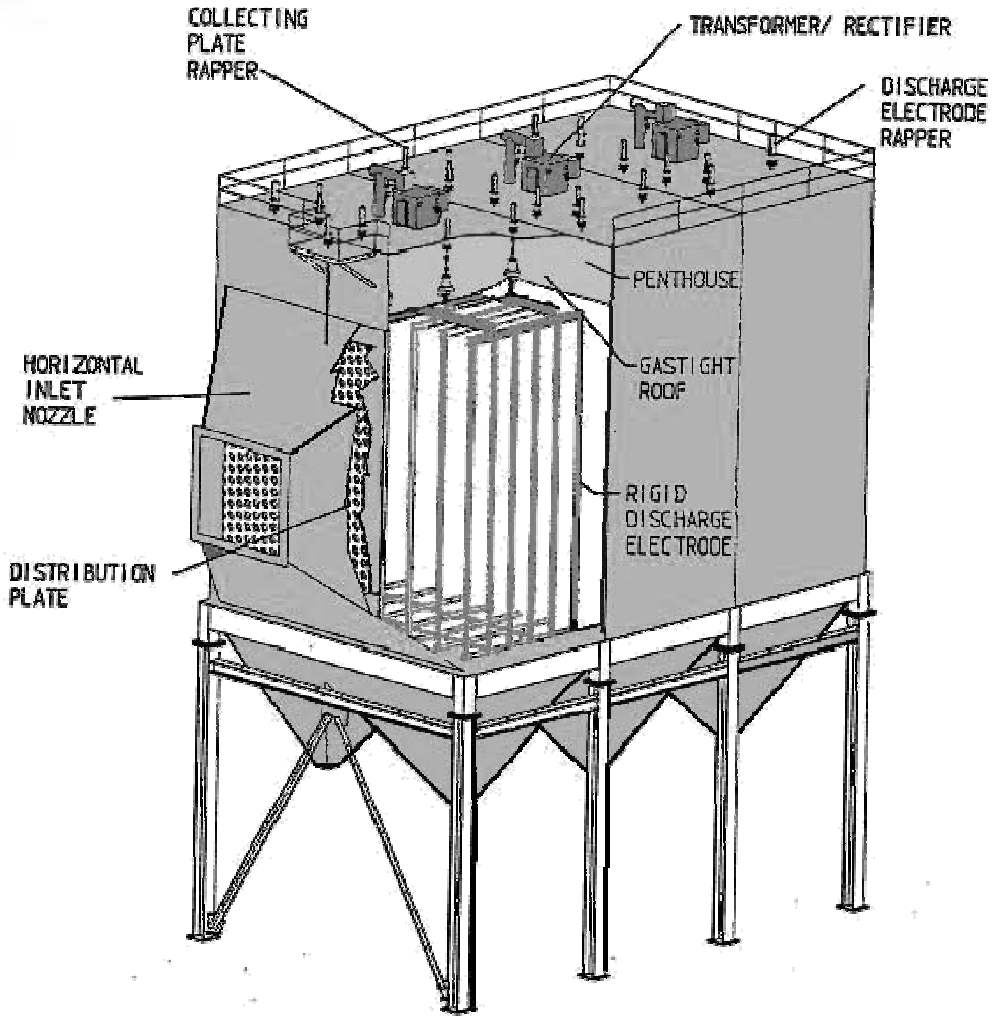
- **Hook the controls to the suppliers PC package, and then have that filter selected data and communicate it with the DCS**



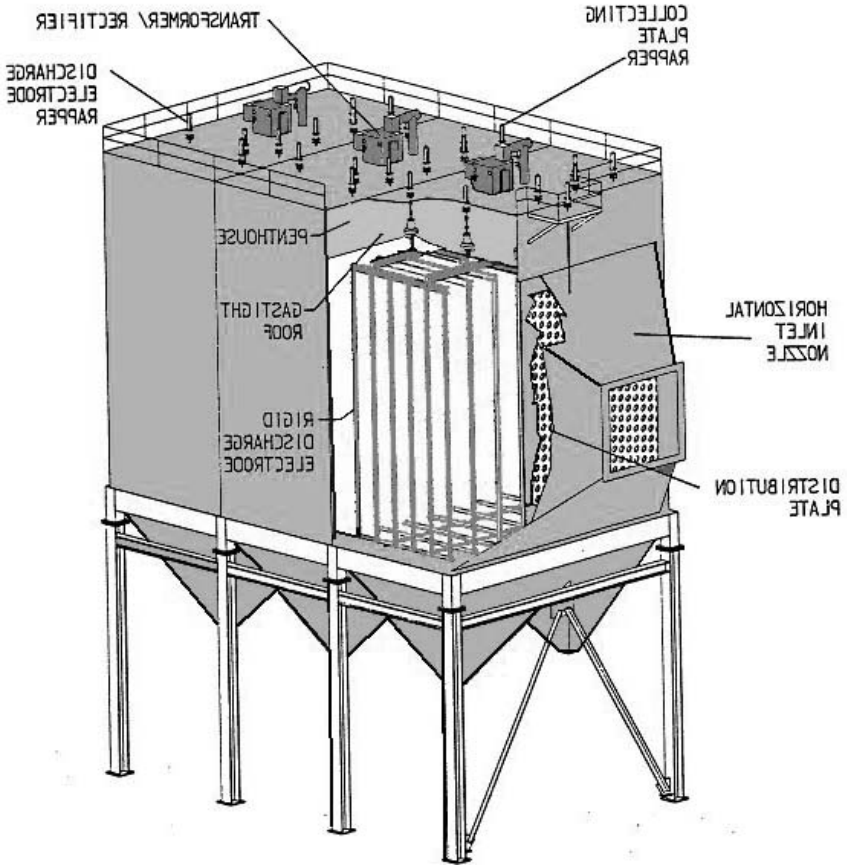
Start-Up

- **Front to Back?**
  Inlet to Outlet

- **Considerations**
  - **Gas / Oil**
  - **Mills**
  - **Temperature Flue Gas / Metals**
  - **Particle size**
  - **Gas velocities**



Shut-Down



- **Back to Front?**
  Outlet to Inlet

- **Considerations**
  - **Gas / Oil**
  - **Mills**
  - **Temperature Flue Gas / Metals**
  - **Particle size**
  - **Gas velocities**

Two Points of Interest

Voltage Controls

- Spark Rates

Rapper Controls

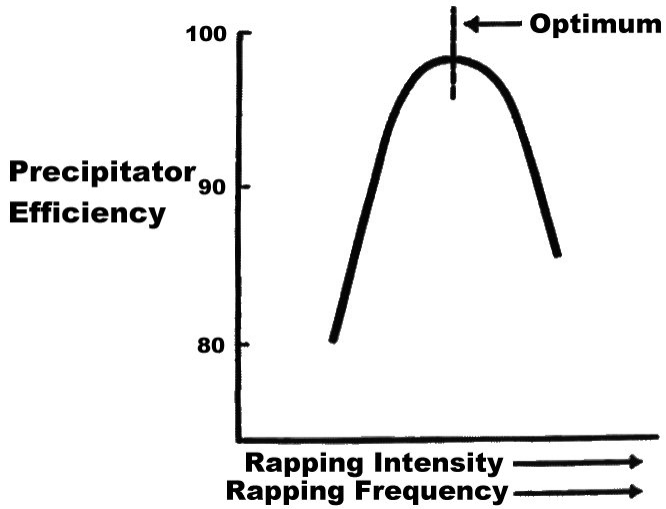
- Re-entrainment

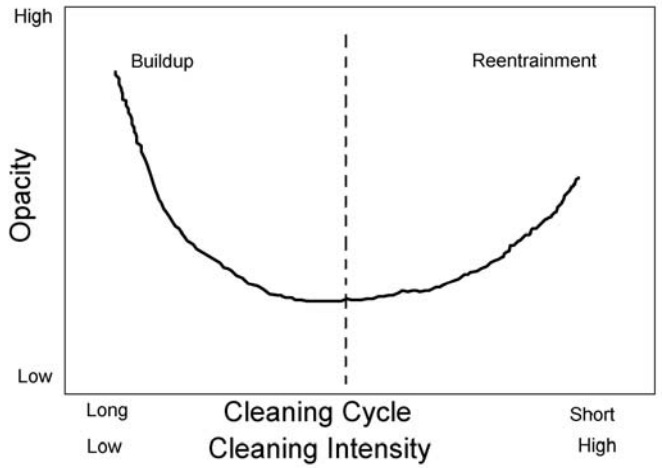
Understanding “Spark Rate”

- What is the “right spark rate”?
- How to determine Normal.
- Should there be an over spark warning alarm.
- When to intervene.

Understanding “Re-entrainment”

- What is the “right rapping intensity”?
- What is the “right rapping frequency”?
- “Over” rapping may increase electrical levels but will ultimately cause re-entrainment and “puffing”.

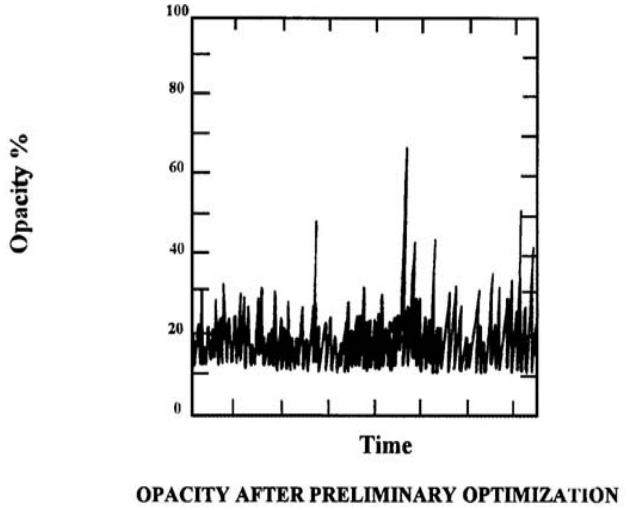




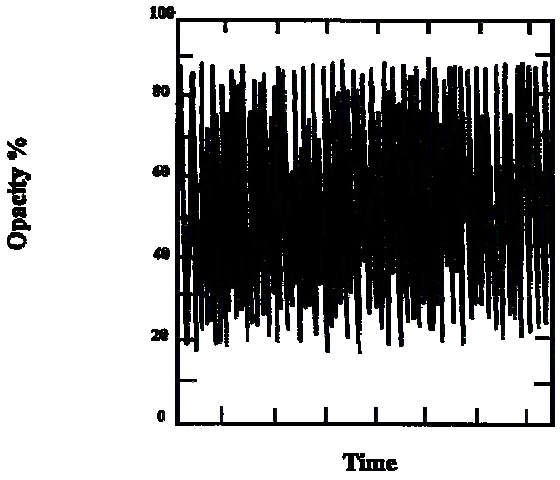
Understanding “Re-entrainment”

- **Reducing rapping intensity may result in internal buildups that reduce clearances, reduce spark-over thresholds.**

- **Excessive sparking contributes to re-entrainment…**
  - **Pitting**
  - **Slip**



OPACITY AFTER PRELIMINARY OPTIMIZATION



OPACITY BEFORE OPTIMIZATION

"Be Careful"

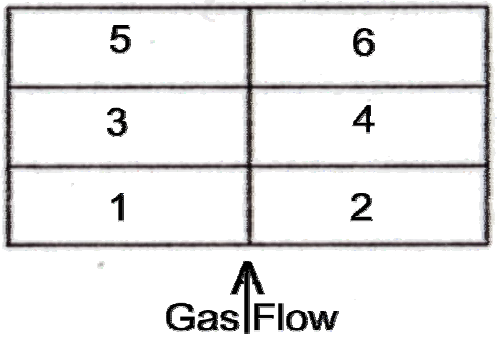
- When adjusting operating parameters allow from a few hours to a few days (depending on how steady your operation is) between program changes for the precipitator to reach "steady state" operation. It is important to have steady boiler or process conditions during optimization.

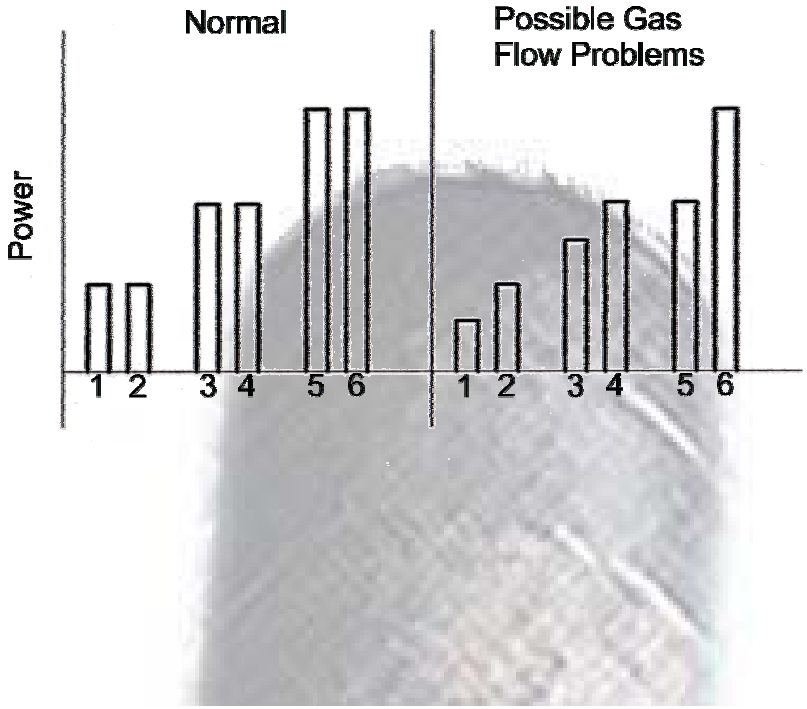
- Changes that produce desired results short term may not last, or may become detrimental in the long run.

- Be careful not to fix one problem while creating another.

ESP Control Tips

- **For troubleshooting, adjust all the controls on the same precipitator field to the same operating parameter settings.**
- **High spark rate/lower power may indicate heavier loading into that field.**
- **Lower spark rate/higher power may indicate low loading or perhaps bypass of the field.**
- **Significant differences in electrical level for like fields typically indicates poor gas flow (assuming alignment is OK in all fields).**

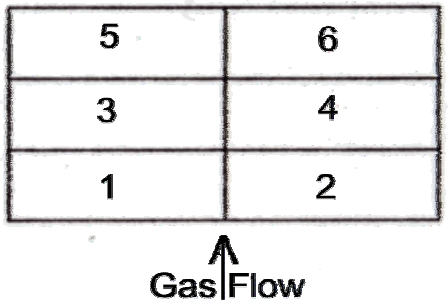


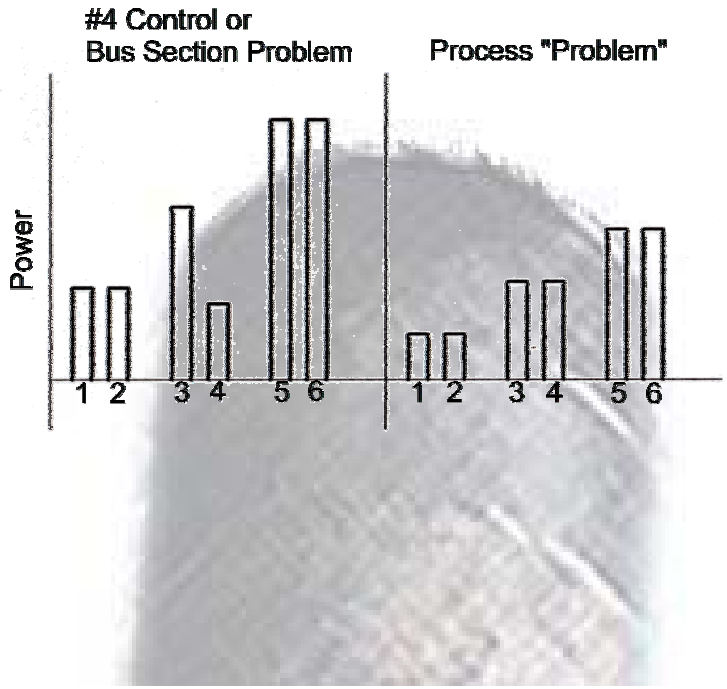


ESP Control Tips

- **When electrical levels change on just one TR control the problem is usually within that control or bus section.**

- **When electrical levels change on all the TR controls the problem is usually associated with the process.**





A Good Precip Engineer's Traits…

- **Patience.**
- **Perseverance.**
- **The ability to stand one's ground.**
- **A good sense of humor.**
- **Never Knows when to give up.**

Thanks for Coming