

**Your Partner For
Air Quality Compliance Solutions**

*A consulting and vendor representative with
Solutions for
Air Quality Compliance and Optimization*

Specializing in

- **Project Development**
- **Timeline and Project Schedule**
- **Technical specifications**
- **Preliminary vendor review and selection**
- **Project Management**
- **Training**
- **Field Implementation**
- **Start-up**
- **Final test and Inspection**

Previous experience

- **Natural Gas fired boilers and turbines**
- **Coal fired boilers**
- **Biomass**
- **Landfill**
- **Refinery Applications**
- **Glass, Chemical and general industry**
- **Gasoline storage and pipeline**
- **Source and Ambient Air Monitoring**

Best Practices

- **Review Project Scope and Permit**
- **Ask Questions**
- **Negotiations**
- **Design with long term operation in mind**
- **Articulate needs to Owner and Operator**
- **List End Goals**
- **Look at Lessons Learned from past projects**
 - **Project Management**
 - **Schedule Management**
 - **Quality and long term operation “End Goal”**

Wrapping up power projects and upgrades

- **Start at the beginning with this in mind**
- **Initial schedule should detail final timeline**
- **This up front mindset will delineate how the process proceeds**
- **Almost like reverse engineering**
- **Power Engineering article**
 - **“New Best Practices for Power Project Planning and Construction” August 2016**

“New Best Practices for Power Project Planning & Construction”

- **Power Engineering interviewed**
 - **Fluor and Kiewit**
- **Working Smarter, Faster**
- **Every phase from concept to commissioning “is executed with a construction driven mindset”**
- **Focuses on identifying ways to accelerate work in the early stages**
 - **Long term operation & final timeline in mind**

Project Management, Design and Engineering Capabilities

- **Review of Technical Specifications**
- **Thorough, detailed CEMS & services proposal**
- **Navigate Federal and Local Regulations**
- **Certification, Parts and Maintenance Focus**
- **Plant “Availability” is our highest priority**

Review project scope and permit

- **Where does the project fit in the plant environmental landscape and physical location. *Air Liquide on Chevron El Segundo permit or BAAQMD start-up/shutdown for gas turbines***
- **Review the Permit or application and give your input to legal during negotiations.**
- **Timeline for implementation**
 - **Owner's Estimates**
 - **Regulatory Drivers**
 - **Budget Constraints**

Ask Questions

- **A review of project scope and permit leads to many questions for clarification**
- **An answer may lead to a new question**
- **To keep track of Q&A, it helps to compile a checklist to identify tasks and timelines**
- **Identify expectations from**
 - **Owner - Key players or departments *involved***
 - **Operator – Who and when will they jump in?**
 - **Engineering Firm – Disciplines involved**
 - **Construction Firm – Trades and skills utilized**

Ask Questions

- **New Power unit or new Pollution Control Equipment upgrade**
- **Review Combustion Process**
- **Specify Compliance CEMS as well as Process Improvement CEMS for APC Control**
 - **Include Measurement Location Information**
 - **Estimated Ranges of Constituents**
 - **Location of Equipment**
 - **Information Required and Purpose**

Negotiations

- **Now that you've identified scope and permit requirements, we can start to talk turkey!**
- **Goals in vendor negotiations**
- **Prepare specifications with input from vendors to ensure it meets expectations**
- **Some drivers to stress**
 - **Performance, Reliability and Availability**
 - **Accuracy and Repeatability**
 - **Calibration Standards for Quality Control**
 - **FAT, SAT and Operational criteria**

Design with long term operation in mind

- **Not just construction mindset or accelerating work in mind**
- **Specifications should state not just initial certification or performance tests**
- **List criteria for long term operation**
 - **Performance and reliability**
 - **Accuracy and Repeatability**
 - **Calibration Standards for Quality Control**
 - **Review Training & Maintenance Intervals**

Articulate needs to Owners and Operators

- **Discuss reality now that project scope, permit and vendor specifications have been reviewed and started to execute**
- **Identify team with players from each organization**
- **Identify tasks for disciplines**
- **Confirm budget for \$ and timeline**

Lists to Meet End Goals

- **Project Specifications**
- **Engineering checklists**
- **Review equipment installation and field checklist during proposal phase to ensure incorporating all the right players**
- **Review source and compliance test checklist**
- **Verify port arrangements with test company**

Insert CEMS Install checklist

- **Cabinet**
- **Shelter**
- **Stack mounted equipment**
- **Sample line**
- **Calibration gas**

- **Different players on each team for the different portions of the install**

Look at Lessons Learned from Past Projects

- **Look at User Groups websites like WTUI**
- **Discuss with vendors**
- **Vendor Lessons Learned Presentations**
- **Ask project team for feedback on vendor selection and schedule**

Look at Lessons Learned from Past Projects

- **Look up and down when siting shelter, everybody looks 360 on the ground**
- **Overhead lines can impede crane from setting shelter in place**
- **Underground lines and piping can be hidden**
- **Storage for cal gas cylinders**
 - **Sufficient quantity for operation and test**
- **Clearance for safe work access**

Look at Lessons Learned

- **Weather and environmental conditions**
- **Only outdoor power plant in CA is closing**
- **Special considerations on equipment design for marine environment**
- **Stainless steel or painted steel = long life**
- **Corrosive coatings on coils and HVAC parts exposed to the elements**

Look at Lessons Learned

- **Calibration Cylinders**
- **Identify specs and quantity early on**
- **Operation and test cylinders**
- **Storage constraints**
 - **Too hot or too cold if outside?**
 - **No room near CEMS**
- **Meet OSHA and safe storage**
- **Issue PO**

Prepare for test crew

we'll follow with Kevin Crobsy – Joanne Randall ppt

- **Sample ports**
- **Test ports (ask early on in design)**
- **Does your stack look like Swiss cheese?**
- **Platform access if ports on different levels or planes**
- **Power and access for test vans**
- **Long or multiple array test probes may need special facilities or access**
- **Ensure safe work access**

Factory Acceptance Test (FAT)

Show 'n Tell Time!

- Scheduling
- Pre-test procedure
- Test as much as you can
- Check list
- Simulate reality
- Test drive the equipment
- Detailed to-do list w/schedule
- Don't forget to check the data
- Equations/programming
- Averaging times
- Tracking/Reports

Installation

There's no "I" in "Team"

Check with the right people

- Delivery and storage
- Turn up the AC please.
- Coordination
- Schedule
- Who's doing what?
- Terminations
- Temporary vs permanent
- Goody; another trip to LA!
- Issue resolution

Shake Down

That's why they call it Shakedown!

- Do they have to run CEMs all the time?
- Does someone know how to run this?
- Was that bus blackout bad for it?
- We've lost communications again!
- Calibration fail again?
- Hey, I'm just the operator.
- Hi Ho, Hi Ho, its 10 more tests to Go!
- Move the probe?
Location, location, location!
- Who's in charge here?
- Stay calm, I have it all under control.
- Help Mr. Wizard!



Certification

It's not over 'til it's over

- Explain the list and schedule
- Save the easy one to last
- Coordinate operation
- OK, who's got the gas??
- 7-day = 8-day. Huh?
- The evil RATA
- Make sure you will pass
- Stratification/cyclonic flow
- Get agency buy-in
- Steady as she goes
- Test report coordination
- Follow-up



Completion

The Eternal Punch List

- Connections (no leaks)
- Clean-up (What's this for?)
- Spare parts (check contract)
- Training
- Check all DAHS functions
- Agency agreement
- On-going maintenance agreement
- Change order agreement
- Cost/Schedule
- Plant mod. may require RATA
- CEMs mod. may require recertification

Walk In Shelters



Questions ???



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