

REINHOLD ENVIRONMENTAL®



2026 Reinhold/PCUG Round Table Presentation

Hosted by TVA, Southern Company and Vistra
in the Sonesta Nashville Airport Hotel, Nashville, TN
on June 22-23, 2026

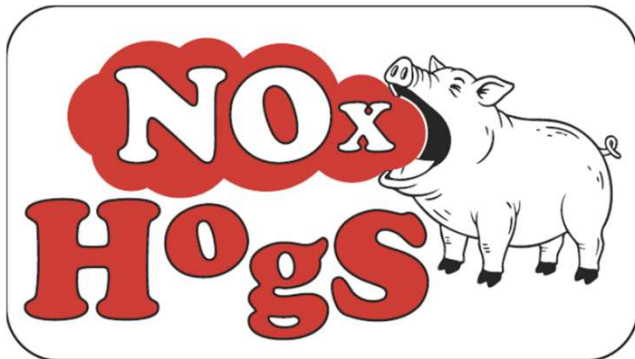
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SCR Troubleshooting and AIG Testing

Reinhold

Round Table 2026

6/23/2026



Environmental Diagnostic, Testing, and Consulting Services

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Where to start?

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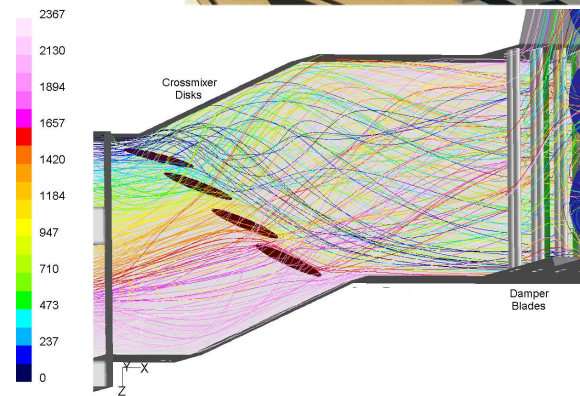
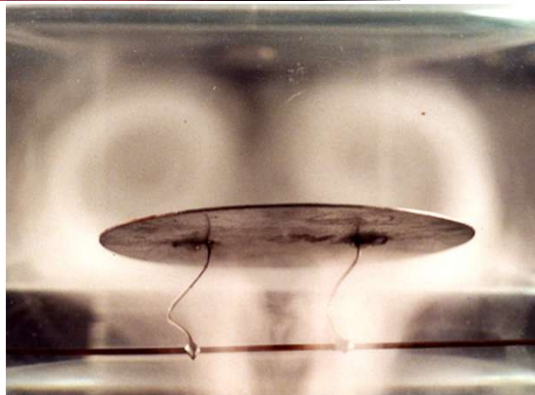
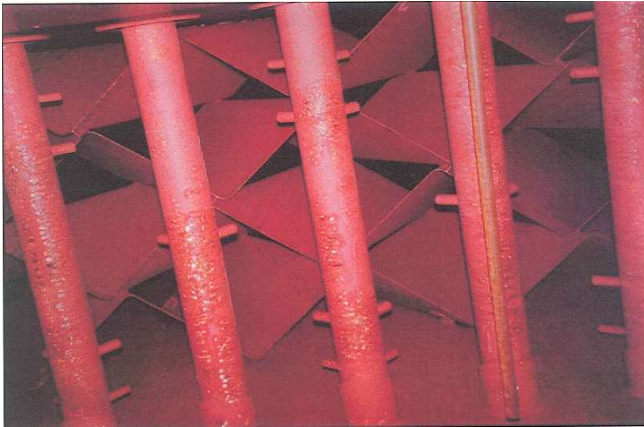
Gas Profile Survey

Operating Characteristics of the SCR

Types of Mixing Systems

- Straight Line - Devices straighten flow, intensive grid to match NO_x profile
- Shifting Mixers - Devices alternately shift gases horizontally and vertically, NH₃ injected through one or more multi-nozzled header.
- Zonal Mixers - Devices divide duct into zones with intensive mixing, NH₃ adjusted for each zone.
- Vortex Mixers - Devices create vortices throughout duct, NH₃ injected into a vortex device.

Types of Mixing



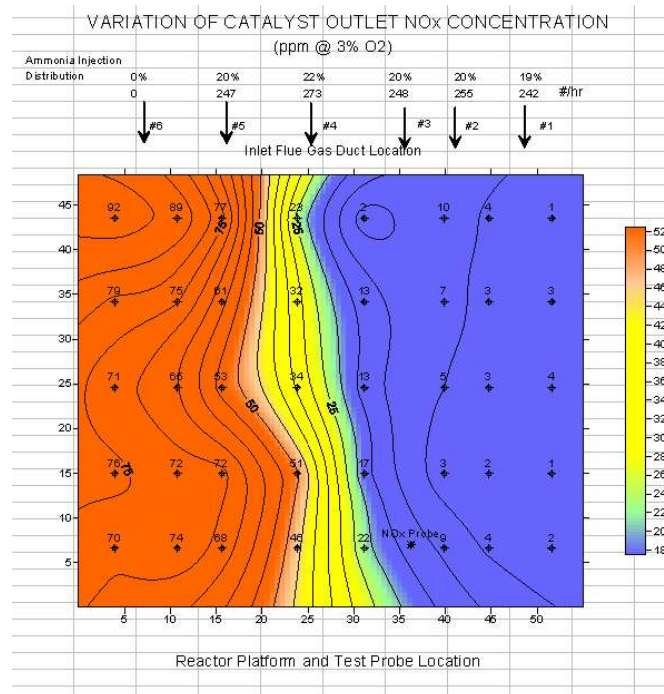
Gas Profile Survey

Operating Characteristics of the SCR

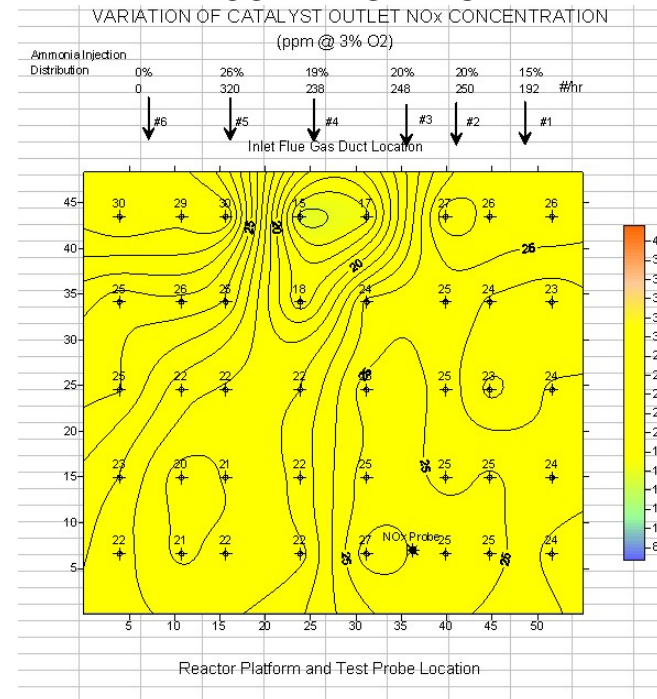
Residual Outlet NO_x Profile

SCR Distributions

Does it Look Like This



Look Like This



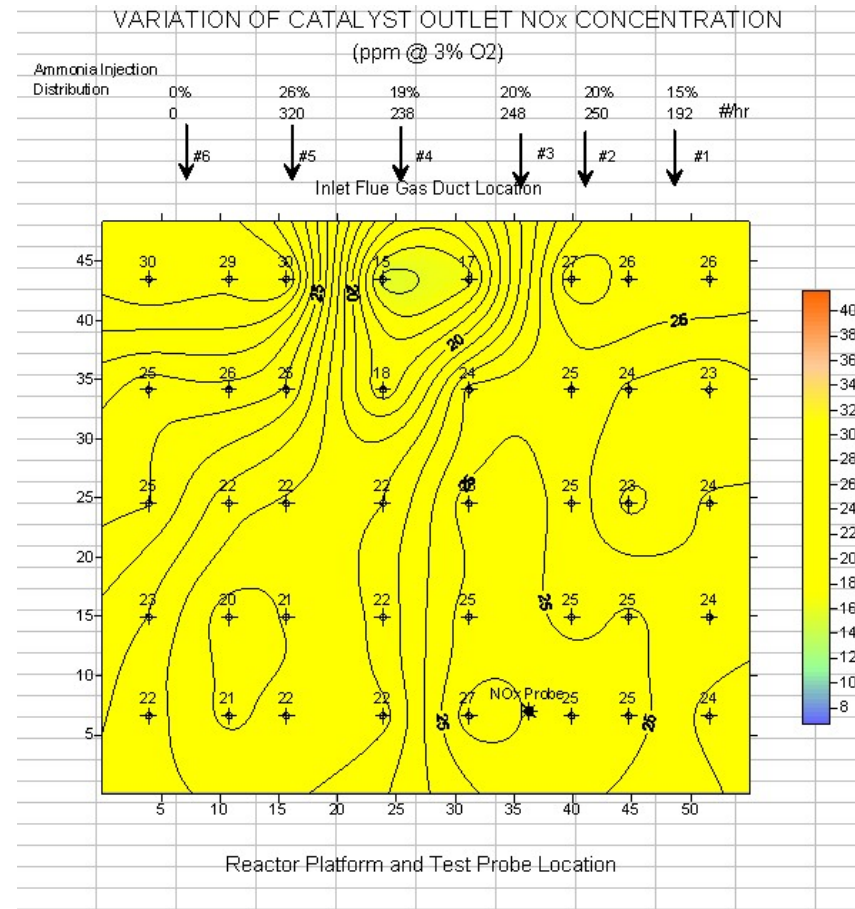
Gas Profile Survey

Operating Characteristics of the SCR

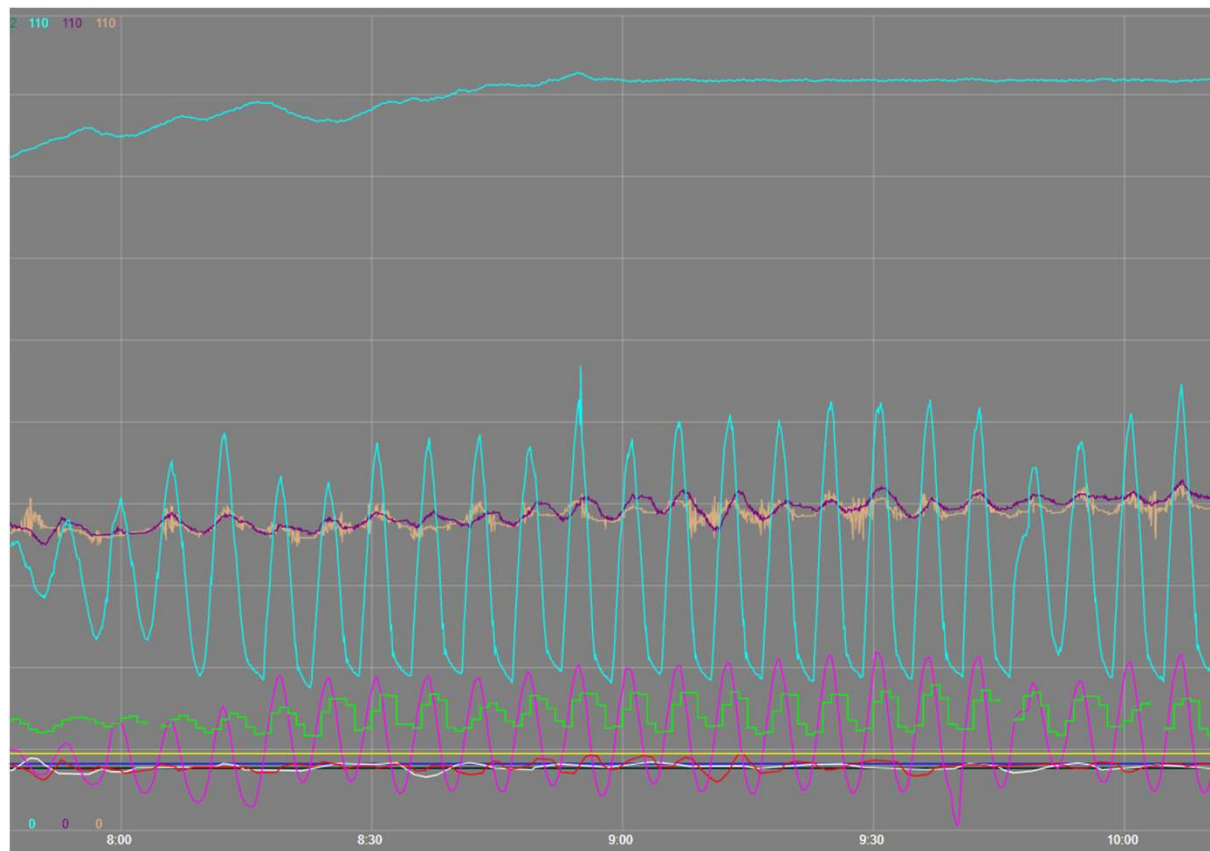
Residual Outlet NO_x Profile

Outlet NO_x Control

Outlet NOx Monitor



Controls



Gas Profile Survey

Operating Characteristics of the SCR

Residual Outlet NO_x Profile

Outlet NO_x Control

Expected Unit Loading

Duct and AH Arrangement

Available NH₃ Indication and Location

Furnace NO_x

Basic Parameters to Look at

Outlet NOX CEMS Slip Ind. Nozzle Flows

Basic Parameters to Look at

Outlet NOX CEMS Slip Ind. Nozzle Flows

Check Outlet NOx
Sampling System for
Leak or Pluggage

Basic Parameters to Look at

Outlet NOX CEMS Slip Ind. Nozzle Flows

Check for sampler
heater or analyzer
problems

Basic Parameters to Look at

Outlet NOX CEMS Slip Ind. **Nozzle Flows**

Nozzle plugged away
from outlet analyzer

Basic Parameters to Look at

Outlet NOX CEMS Slip Ind. **Nozzle Flows**

Nozzle plugged near
the outlet analyzer
(prompt Attention)

Exercise 1

- Reported High NH₃ usage
- No indication of increased slip
- Controls fairly stable
- Residual Outlet NO_x spot check no major distribution issue
- CEMs NO_x normal to a tad High
- Hg at normal level
- Inlet NO_x 1.5 to 2x Normal

Exercise 2

- 202A
- Some Indications of slip
- Controls fairly stable
- Residual Outlet NOx spot check no major distribution issue
- CEMs NOx normal relative to NOx Outlet
- Hg at normal level
- Inlet NOx Elevated
- High cat dp plugged
- Urge to over comply (NOx), SDA Operation

Exercise 3

- Some Indications of slip
- Controls fairly stable
- Residual Outlet NOx spot check no major distribution issue
- Elevated O₂ During Spot Checks
- CEMs NOx normal to a tad High
- Hg at normal level
- Slip confirmed (NH₂ Slip Probe)
- SCR Temps running Low
- Casing leaks – local sub MCOT – (highest slip)
- High cat dp plugged

What is NH_3 System Balancing?

- Adjusting the NH_3 injection so that the NH_3 profile in the SCR matches the NO_x profile sent to the SCR from the combustion source.
- This is accomplished by measuring the residual outlet NO_x of the SCR, then adjusting the NH_3 injection valves until the residual outlet NO_x is as even as possible.

Why Balance Your NH₃ Injection?

- Achieve best NH₃ to NOx ratio possible
- This gives highest potential for removal of NOx
- Most efficient use of NH₃ to meet target NOx levels
- Lowest amount of NH₃ slip
- Most room for control swings
- Assists with trouble shooting down the road

Know Your SCR System Before You Start

What are the strengths and weaknesses of the SCR system?

Does the NO_x to the SCR have a consistent profile?

How much flexibility is there to make adjustments?

Is there adequate coverage with test ports?

Are the sample [probes](#) in good condition?

How finely tuned are the controls?

Where's the closest restroom and what is the approximate time to get there?

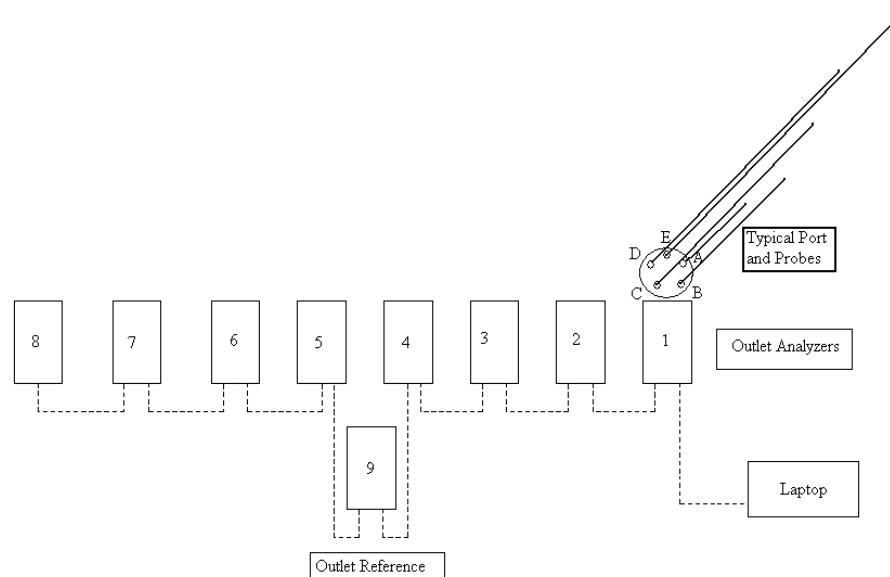
Typical Setup

One analyzer per port, plus one reference analyzer per grid (9 analyzers for largest reactors when doing outlet only)

All analyzers "daisy chained" and connected to a laptop

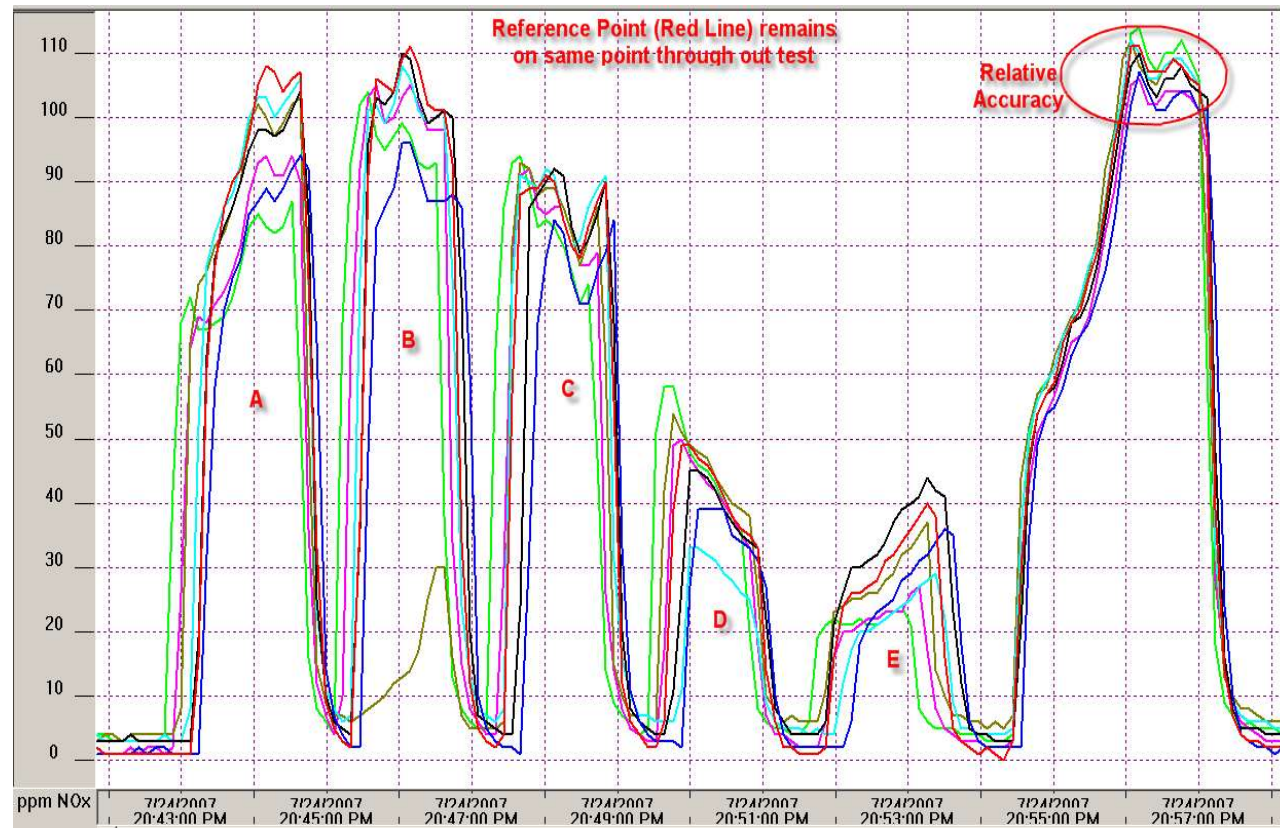
6 segments for each test

- 1 segment for each of the 5 probe depths
- A relative accuracy test at the end

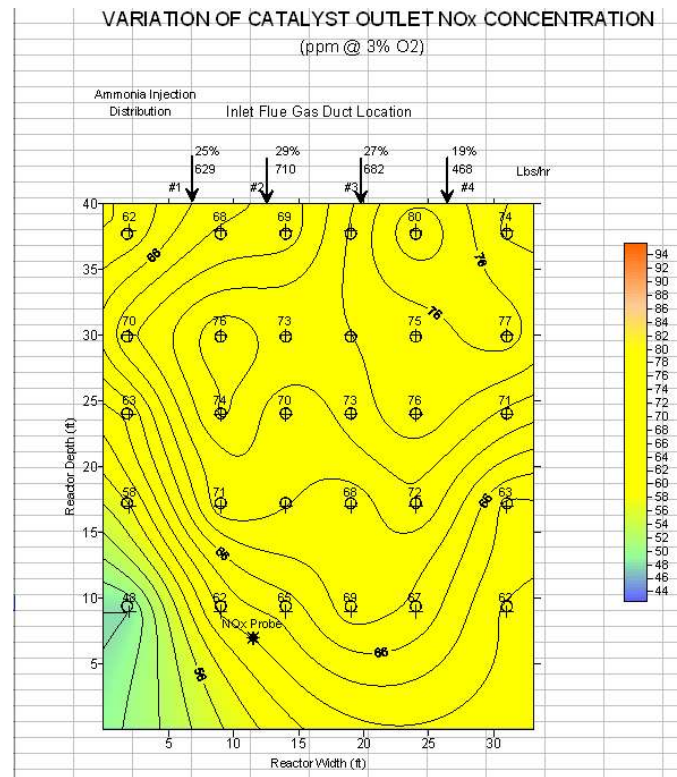




Reference and Relative Accuracy



The Result



Communications Strategy

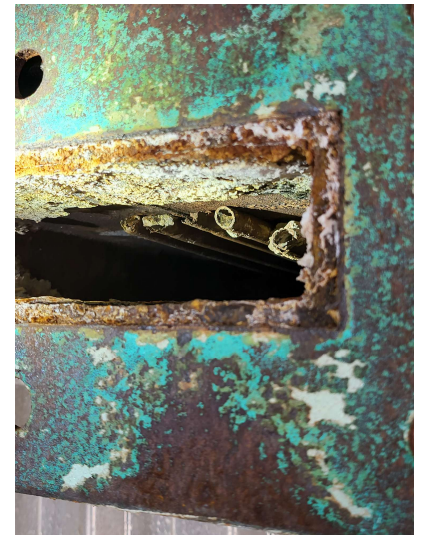


Summary

Questions?

Probe Corrosion

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