SELECTIVE CATALYTIC REDUCTION

WHY DO WE HAVE TO USE IT?

HOW DOES IT IMPACT THE FACILITY?

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THE PRIMARY FUNCTION OF SELECTIVE CATALYTIC REDUCTION (SCR) IS TO REDUCE THE EMISSIONS OF NOx

WE ARE ALREADY BUYING GAS TURBINE AND RECIPROCATING ENGINE DRIVERS THAT ARE THE BEST TECHNOLOGY IN LOW NOx EMISSIONS
WHY DO WE NEED TO GO LOWER?

• **AIR PERMITS**
  • IF SITE TOTAL EMISSIONS WITH BEST ENGINE TECHNOLOGY WOULD PUT THE PROJECT OVER AN EMISSIONS THRESHOLD THEN FURTHER REDUCTION WITH SCR CATALYST MIGHT MAKE THE DIFFERENCE IN MAJOR/MINOR SOURCE CLASSIFICATION OR EVEN IN GETTING THE AIR PERMIT AT ALL

• **PUBLIC SUPPORT**
  • FOR SOME NEW PIPELINE PROJECTS THE PIPELINE OWNER DECIDES THAT THE MOST EFFECTIVE WAY IN GAINING PUBLIC SUPPORT FOR THE PROJECT IS TO OFFER BEST IN CLASS EMISSIONS PERFORMANCE THAT IS BETTER THAN THE BEST CURRENTLY AVAILABLE FROM THE ENGINE/TURBINE MANUFACTURERS
SUPPLIER EXPERIENCE AND SUPPORT?

- THERE IS A LOT OF EXPERIENCE IN SUPPLYING SCR UNITS IN THE PAST --- ON
  - GENERATOR UNITS – BOTH TURBINE AND ENGINE DRIVEN
  - AT NEAR FULL LOAD – WITH LITTLE LOAD VARIATION
  - WITH DIESEL AND NATURAL GAS FUEL

- SUPPLIERS ARE GAINING EXPERIENCE ON BEING ABLE TO DEAL WITH VARYING SPEED AND LOAD DRIVERS AS WELL AS WORKING WITH THE GAS INDUSTRY vs. ELECTRIC UTILITY OR INDUSTRIAL USER
  - BUT THAT EXPERIENCE IS NOT A GIVEN
  - SO BE SURE THAT YOUR SUPPLIER COMPLETELY UNDERSTANDS THE MINIMUM AND MAXIMUM MASS FLOWS AND THE MINIMUM AND MAXIMUM EXHAUST TEMPERATURES AS WELL AS YOUR STANDARDS AND NEEDS - THE ABILITY TO FOLLOW THE UNIT LOAD IS IMPORTANT

- VENDOR SUPPORT – DESIGN / COMMISSIONING / POST INSTALLATION
Titan-130 in a gas fueled generator application
HOW DOES IT IMPACT YOUR FACILITY?

• SITE FOOTPRINT WILL BE BIGGER
  • LARGER EXHAUST SYSTEM
  • REDUCTANT STORAGE TANK AND FORWARDING PUMPS
  • SKID MOUNTED COMPONENTS – SUCH AS COOLING AIR BLOWERS W/ VFDs AND COOLING AIR INTAKE FILTER SILENCER
  • DOSING PANEL/SKID

• ELECTRICAL LOAD WILL BE BIGGER – BIGGER GENERATOR, LARGER ELECTRICAL SERVICE, BIGGER MCC
  • COOLING AIR BLOWERS W/ VFDs
  • REDUCTANT FORWARDING PUMP
  • REDUCTANT HEATER
  • REDUCTANT DOSING SYSTEM

• NOISE – BE SURE THAT THE TRADITIONAL SPECIFICATION IS REVISED TO TAKE INTO ACCOUNT THE RE-RADIATED NOISE FROM THE CARCUS OF THE SYSTEM AS WELL SILENCING FOR THE COOLING AIR BLOWER MOTORS
Storage Tank for Two Caterpillar 3616 units
HOW DOES IT IMPACT YOUR FACILITY?

• CATALYST ACCESS – ENGINES, EXHAUST PIPES WHICH USED TO RUN OVERHEAD WILL NOW BE NEED TO BE LOWERED TO GRADE FOR CATALYST ACCESS OR BUILD A PLATFORM FOR ACCESS HIGHER UP
  -- GAS TURBINES, HEIGHT OF THE CATALYST PANELS WILL REQUIRE THOUGHT ABOUT ACCESS FOR MAINTENANCE AND CHANGEOUT
• CHOICE OF REDUCTANT
  • AMMONIA
    • ANHYDROUS – DOT CLASSIFIED AS A HAZARDOUS MATERIAL
    • AQUEOUS – VARIOUS CONCENTRATIONS – 19% IS COMMONLY USED TO LIMIT THE MATERIAL CLASSIFICATION TO CORROSIVE
  • UREA SOLUTION – NEEDS TO BE STORED IN A HEATED AND INSULATED TANK TO PREVENT CRYSTALLIZATION
SCR Catalyst and Cooling Air Blower for Caterpillar 3616 unit
Exhaust System w/ Oxidation and SCR Catalyst for Caterpillar 3616 unit
ENGINEERING / OPERATIONS SUPPORT

- DEVELOP PROCUREMENT SPECIFICATIONS
  - MAY WANT TO OBTAIN SEPARATELY, IF PREVIOUSLY PROCURED AS PART OF THE ENGINE/TURBINE PACKAGE
- VENDOR DRAWING REVIEWS
- DEVELOPING STANDARD OPERATING PROCEDURES TO ADDRESS DAY TO DAY MATERIAL HANDLING AND FOR REDUCTANT DELIVERY
- INCREASED COMPANY INTERNAL TECH SUPPORT
THANK YOU

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