

Technical Articles

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FEDERAL APPEALS COURT VACATES EPA'S CROSS STATE AIR POLLUTION RULE

The U.S. Court of Appeals for the District of Columbia has ruled that the EPA exceeded its authority in crafting the *Cross-State Air Pollution Rule (CSAPR)*, aka *Transport Rule*. EPA had argued that CSAPR would lead to reductions of nitrogen oxide and sulfur dioxide emissions by more than 50% from 2005 levels by 2014. The rule's challengers argued that the rule would place an undue strain on the country's electric grid.

The Court found the legal principles that govern this case straightforward: Without a claim of constitutional authority executive agencies may exercise only the authority conferred by statute, and agencies may not transgress statutory limits on that authority. It found the *Transport Rule* exceeds the agency's statutory authority in two independent respects.

First, the statutory text grants EPA authority to require upwind States to reduce only their own significant contributions to a downwind State's nonattainment. But under the *Transport Rule*, upwind States may be required to reduce emissions by more than their own significant contributions to a downwind State's nonattainment. EPA used the good neighbor provision to impose massive emissions reduction requirements on upwind States without regard to the limits imposed by the statutory text so as a policy matter, the *Rule* violates the statute.

Second, the *Clean Air Act* affords States the initial opportunity to implement reductions required by EPA under the good neighbor provision. But under the *Rule* EPA quantified States' good neighbor obligations. It did not allow the States the initial opportunity to implement the required reductions with respect to sources within their borders. Instead, EPA quantified States' good neighbor obligations and simultaneously sets forth EPA-designed Federal Implementation Plans (FIPs) to implement those obligations at the State level. By doing so, EPA departed from its consistent prior approach to implementing the good neighbor provision and violated the *Act*.

The court ruled for each of those two independent reasons, EPA's *Transport Rule* violates federal law so must be vacated. The *Rule* now has remanded to EPA to be rewritten.

The 104-page decision may be read at: <http://www.power-eng.com/content/dam/pe/online-articles/documents/2012/08/CSAPR%20Opinion%20copy.pdf>

GAO RELEASES ANALYSIS OF EPA RULES AFFECT ON COAL-FIRED POWER PLANTS

The Government Accountability Office (GAO) has released a report that analyzed how coal-fueled electric generating units, which provide almost half of the electricity in the U.S., may respond to four key EPA regulations: (1) the *Cross-State Air Pollution Rule*; (2) the *Mercury and Air Toxics Standards*; (3) the proposed *Cooling Water Intake Structures* regulation; and, (4) the proposed *Disposal of Coal Combustion Residuals* regulation. (The report was issued before the courts ruled the current Cross-State Air Pollution Rule had to be vacated as noted above.)

The analyses suggest companies may retrofit most coal-fueled generating units with controls to reduce pollution, and that 2 to 12% of coal-fueled capacity may be retired. Some regions may see more significant levels of retirements. One study examined 11 states in the Midwest and projected that 18% of coal-fueled capacity in that region could retire. EPA and some

stakeholders GAO interviewed stated that some such retirements could occur as a result of other factors such as lower natural gas prices, regardless of the regulations. Power companies may also build new generating units, upgrade transmission systems for reliability and increase natural gas use to produce electricity as coal units retire, and remaining coal units become somewhat more expensive to operate.

The analysis also found that these actions would likely increase electricity prices in some regions. The studies GAO reviewed estimated that price increases could vary across the country, with one study projecting increases from 0.1% in the Northwest to 13.5% in parts of the South that are more dependent on electricity generated from coal. (According to EPA, the agency's estimates of price increases would be within the historical range of price fluctuations and projected future prices may be below historic prices.)

Regarding reliability, these actions are not expected to pose widespread concerns but may contribute to challenges in some regions. Some other stakeholders GAO interviewed identified potential reliability challenges. Among other things, it may be difficult to schedule and complete all retrofits to install controls and to resolve all potential reliability concerns associated with retirements within compliance deadlines.

A one-page summary of the study is available at: <http://gao.gov/assets/600/592544.pdf>

The complete 105-page study may be viewed at: <http://gao.gov/assets/600/592542.pdf>

ELECTRIC CAPACITY ADDITIONS DOMINATED BY NATURAL GAS & RENEWABLES

During the first half of 2012, 165 new electric power generators were added in 33 states, for a total of 8,098 megawatts (MW) of new capacity, according to an *Energy Brief* issued by the U.S. Energy Information Administration (EIA). Of the ten states with the most capacity additions, the new capacity uses natural gas or renewable energy sources. Capacity additions in these ten states total 6,500 MW, or 80% of the new capacity added nationally in the first six months of 2012.

Most of the new generators built over the past 15 years are powered by natural gas or wind and this trend is continuing in 2012 across much of the United States. In particular, efficient combined-cycle natural gas generators are competitive with coal generators over a large area of the country. During the first half of 2012, these combined-cycle generators were added in states that traditionally burn mostly coal (with the exception of Idaho, which has significant hydroelectric resources).

Only one coal-fired generator was brought online in the first half of 2012, an 800-MW unit at the Prairie State Energy Campus in Illinois. In its 2011 annual survey of power plant operators, the EIA received no new reports of planned coal-fired generators. Of the planned coal generators in their databases, 14 are reported in the construction phase, with an additional 5 reporting a planned status but not yet under construction. Only one of the 14 advanced from a pre-construction to an under-construction status between the 2010 and 2011 surveys.

More small generators were added than large generators: of the 165 generators added, 105 were less than 25 MW. Many of these use renewable energy sources, most commonly solar and landfill gas; wind plants aggregate many individual turbines into one large "generator" for reporting purposes. So far, 2012 has also seen a significant number of small new peaking generators, the combustion turbines and internal combustion engines that operate when electric

demand is at its highest. These technologies are usually fueled by natural gas or petroleum, but can also burn landfill gas or agricultural byproducts. Michigan alone added 8 of these in the first half of 2012.

More capacity was added in the first half of 2012 than was retired. A total of 3,092 MW was retired, from 58 generators in 17 states. Over half of this was coal, and another 30% was petroleum-fired generators. Two *Today in Energy* articles (<http://www.eia.gov/todayinenergy/>) address future coal generator retirements, both as reported by power plant owners and operators, and as projected by *EIA* as part of a long-term forecast (<http://www.eia.gov/todayinenergy/detail.cfm?id=7330>)

The entire analysis may be viewed at:

<http://www.eia.gov/todayinenergy/detail.cfm?id=7610&src=email#>

EPA RETAINS THRESHOLDS FOR STEP 3 GHG PERMITTING RULES

The EPA chose not to revise the permitting thresholds for greenhouse gas emissions (GHG) in a final rule released in July, but it did approve plant wide applicability limits for industrial facilities.

New facilities that emit 100,000 tons/year of carbon dioxide-equivalent and existing facilities that increase their emissions by 75,000 tons/year of carbon dioxide-equivalent will be required to obtain prevention of significant deterioration and Title V operating permits.

EPA said it is retaining those existing permitting thresholds because state permitting authorities need more time to develop the infrastructure necessary to issue greenhouse gas permits. Reductions in state environmental agency budgets as part of the overall reductions in state budgets precipitated the action.

EPA plans to complete a study of the administrative burdens associated with the permitting requirements by April 30, 2015. The next review of the permitting thresholds is due for completed by April 30, 2016 and EPA then could revise the thresholds.

EPA's final rule is available at <http://www.epa.gov/nsr/documents/20120702fr.pdf>.

For more information, contact Michael S. Brooks in EPA's Office of Air Quality Planning and Standards at (919) 541-3539 or brooks.michaels@epa.gov.

ASTM DEVELOPS FRETTING FATIGUE TESTING GUIDE

Standard E2789, *Guide for Fretting Fatigue Testing*, has been developed by Subcommittee E08.05 on *Cyclic Deformation and Fatigue Crack Formation*. They are part of Committee E08 on *Fatigue and Fracture*.

Fatigue fretting is the process of crack formation and progressive crack growth at a location in a mechanical system where two components are in contact and undergoing a vibratory loading. This can occur with functioning mechanical seals, for example. This new ASTM Standard is designed to provide insights on what conditions promote fretting fatigue and offers approaches to the design of experiments to assess it. ASTM reports that there are no standards for conducting and analyzing fretting fatigue tests. The Guide serves as a starting point for someone who wants to evaluate the fretting fatigue response and consequent wear of two materials in contact.

For more information contact Jeffery Adkins, ASTM Staff at; jadkins@astm.org

U.S. GHG EMISSIONS CONTINUE TO FALL

Nine states in the Northeast have banded together to create a regional plan for control of GHG emissions. In 2008 the *Regional Greenhouse Gas Initiative (RGGI)* established a system where emissions of climate-altering gases were capped and the rights to emit those gases would be auctioned by a cap-and-trade market.

The market is limited to utilities. The initial cap was set at 165 million short tons of carbon dioxide (CO₂) per year through 2012, but the utilities have already cut emissions well below that level, averaging 126 million tons from 2009 through 2011, according to the *RGGI*. That level is below the goal set for 2018.

The global recession at the beginning of that period had some effect on the emissions drop; average power consumption over the three-year period was 2.4% below the average for the years 2006 through 2008. But other factors had greater effects, according to the *RGGI*. Chief among them were the switch from coal to natural gas fuel for power production, state investments in energy efficiency and a greater use of carbon-free energy sources such as wind and solar.

The reduction in GHG emissions from Northeast utilities reflected a larger trend in the U.S. According to a May report by the *International Energy Agency (IEA)*, CO₂ emissions in the U.S. fell by 92 million metric tons-or 1.7% in 2011. Since 2006, annual U.S. emissions have dropped by 430 million metric tons, or 7.7%. The drop in U.S. emissions is larger than that of any other country.

The emissions reduction was due to several long-term trends, the IEA reported. Increased automobile efficiency and high fuel prices have reduced oil consumption and power utilities are shifting away from coal to low-carbon fuels such as natural gas.

The good emissions news in the U.S. was offset by increased carbon emissions in the developing world, especially China and India. The 0.6% emissions reduction in the developed world in 2011 was swamped by the 6.1% increase in the developing world, according to the IEA.