Kansas City Power & Light Company and KCP&L Greater Missouri Operations Company Impacts

Missouri Public Service Commission
Environmental Regulations Overview

October 28, 2013 Staff Workshop

In the Matter of an Investigation of the Cost to Missouri's Electric Utilities Resulting from Compliance with Federal Environmental Regulations

File No. EW-2012-0065

KCP&L energizing life

Discussion Agenda

Environmental Regulations Overview

- Air Rules
  - Clean Air Interstate Rule (CAIR)
  - Cross-State Air Pollutant Rule (CSAPR)
  - Mercury and Air Toxics Standards (MATS)
  - Sulfur Dioxide, Ozone, and Particulate Matter National Ambient Air Quality Standard (NAAQS)
  - Regional Haze / Best Available Technology Rule (BART)
  - Industrial Boiler Maximum Achievable Control Technology Rule (Industrial Boiler MACT)
  - Green House Gas New Source Review and New Source Performance Standards (GHG NSR & NSPS)
- Water Rules
  - Clean Water Act 316(a)
  - Clean Water Act 316(b)
  - Effluent Limitation Guidelines
- Waste Rules
  - Coal Combustion Residuals Rule (CCR)
- Current Estimate of Capital Expenditures

Environmental Terms

SO2	Sulfur dioxide
NOx	Nitrogen oxides
CO2	Carbon dioxide
CO	Carbon monoxide
VOC	Volatile organic carbons
PM	Particulate matter
GHG	Greenhouse gas
HAP	Hazardous air pollutants
LNB	Low NOx burner
OFA	Over fired air
SCR	Selective catalytic reduction
SNCR	Selective noncatalytic reduction
ACI	Activated carbon injection
CEM	Continuous emission monitors

NAAQS	National Ambient Air Quality Standard
CAIR	Clean Air Interstate Rule
BACT	Best Available Control Technology
PSD	Prevention of Significant Deterioration
MACT	Maximum Achievable Control Technology
NSPS	New Source Performance Standards
NSR	New Source Review
BART	Best Available Retrofit Technology
CAMR	Clean Air Mercury Rule
CWA	Clean Water Act
NPDES	National Pollutant Discharge Elimination System
CCP	Coal combustion products
CCR	Coal combustion residuals
CWA	Clean water act

Clean Air Interstate Rule (CAIR)

Background

- In 2005, EPA finalized the Clean Air Interstate Rule (CAIR) cap and trade program.
- Covered SO_2 and NO_x including Missouri but not Kansas.
- Reduces SO_2 and NO_x that contribute or interfere with maintenance of fine particulate and ozone National Ambient Air Quality Standards (NAAQS) in downwind states.

Timeline

- Reduce summer and annual NOx starting in 2009.
- Reduce annual SO2 starting in 2010.
- Additional SO2 and NOx reductions will be required by 2015.

Compliance

- CAIR was initially vacated in 2008 but ultimately remanded and left program in place until EPA revised rule consistent with the court's opinion.
- Utilities must continue to comply with CAIR and allowances provisions to cover emissions.
- Compliance achieved through allowances trading.

Cross State Air Pollution Rule (CSAPR)

Background

- In August 2011, EPA finalized the Cross-State Air Pollution Rule (CSAPR) which requires substantial near-term emission reductions in Missouri and Kansas to address each state's significant contribution to nonattainment and interference with maintenance of the National Ambient Air Quality Standards (NAAQS) downwind.
- EPA is promulgating the CSAPR in response to the remand of the Clean Air Interstate Rule (CAIR) by the Court in 2008.
- The final rule included four air quality-assured trading programs: an annual NOx trading program, an ozone-season NOx trading program, and two separate SO2 trading programs (SO2 Group 1 - Missouri and SO2 Group 2 - Kansas).

Timeline

- In August 2012, the lower court vacated the CSAPR and remanded the rule to the EPA to revise in accordance with its opinion.
- U.S. Supreme Court has agreed to hear the matter on appeal.

Compliance

- The lower court directed the EPA to continue to administer the CAIR until a valid replacement is promulgated.

Mercury and Air Toxics Standards - (MATS)

Background

- In December 2011, the EPA finalized the MATS rule that will reduce emissions of toxic air pollutants, also known as hazardous air pollutants, from new and existing coal- and oil-fired electric utility generating units with a capacity of greater than 25 MWs.
- The rule establishes numerical emission limits for mercury, particulate matter (a surrogate for non-mercury metals) and hydrochloric acid (a surrogate for acid gases). The rule establishes work practices, instead of numerical emission limits, for organic air toxics, including dioxin/furan.

Timeline

- The rule allows three to four years for compliance or 2015 to 2016 depending on if an extension was requested and received for the generating unit.

Compliance options for MATS

- Electrostatic precipitator (ESP) upgrades for PM (Montrose, Sibley, and Lake Road units)
- Low chlorine coal or DSI for HCL (Montrose, Sibley, and Lake Road units)
- Activated Carbon Injection (ACI) for Hg control (Montrose, Sibley, Lake Road, and Hawthorn units)

National Ambient Air Quality Standard (NAAQS)

Background

- Multiple National Ambient Air Quality Standards (NAAQS) in the pipeline.
- Five-year review cycle.
- EPA has broad discretion in deciding standards.
- Required to set standards at a level “requisite to protect public heath with an adequate margin of safety”.
- Not required to set at levels that eliminates all risk.
- Additional compliance requirements in non-attainment areas.

Timeline

- Typical schedule after promulgation of new NAAQS:
  - Within 1 year states must designate attainment, non-attainment or unclassifiable areas in state implementation plans,
  - EPA has 2 years plus 1 year extension to promulgate area designations,
  - States have 3 years to submit state implementation plans, and
  - States much reach attainment in 5 years with potential for extensions.

Sulfur Dioxide National Ambient Air Quality Standard (NAAQS)

Background

- In June 2010, EPA finalized a new primary National Ambient Air Quality Standard for SO2. EPA established a new 1-hour standard at a level of 75 parts per billion.
- In July 2013, the EPA designated a part of Jackson County, Missouri, which is in the Companies' service territory, as a nonattainment area for the new 1-hour SO2 standard.

Timeline

- The Missouri Department of Natural Resources (MDNR) will now develop and submit their plan to the EPA to return the area to attainment of the standard, which may include stricter controls on certain industrial facilities.
- KDHE and MDNR will complete refined modeling to determine sources impacting standard that will need additional SO2 controls. States with areas designated nonattainment in 2013 would need to submit state implementation plans (SIPs) to EPA by 2014 outlining additional controls that will to be added to meet the standards as expeditiously as possible, but no later than August 2017.

Compliance Options (Montrose, Sibley, and Lake Road units)

- Scrubbers or other SO2 controls with baghouses or upgraded ESPs anticipated.
- Plant specific emission limits.
- Unit de-rates or reduction in level of operation.

Ozone National Ambient Air Quality Standard (NAAQS)

Background

- In 2008, EPA revised the primary and secondary standards to 0.075 parts per million (ppm).
- EPA indicated based on the available ozone air quality data that the Kansas City area would meet the standard.

Timeline

- EPA anticipated to complete new designations in 2015.
- Attainment dates potentially around 2020.

Compliance Options

- States implementation plans outline what controls may be necessary to reduce ozone to meet the standards in non-attainment areas.
- Nonattainment may require additional NOx reduction controls to be added to generation facilities.
- Both MDNR and KDHE will review and potentially require controls on NOx emission sources to achieve attainment of the revised ozone standard.

Particulate Matter National Ambient Air Quality Standard (NAAQS)

Background

- In December 2012, the EPA strengthened the annual primary NAAQS for fine particulate matter (PM2.5).
- With the final rule, the EPA provided recent ambient air monitoring data for the Kansas City area indicating it would be in attainment of the revised fine particle standard.
- States will now make recommendations to designate areas as meeting the standards or not meeting them with the EPA making the final designation.

Timeline

- States will now make recommendations to designate areas as meeting the standards or not meeting them with the EPA making the final designation.

Compliance Options

- States implementation plans outline what controls may be necessary to meet the standards in non-attainment areas.
- Nonattainment may require additional controls to be added to generation facilities.
- Both MDNR and KDHE will review and potentially require controls on emission sources to achieve attainment of the revised PM standard.

Regional Haze / Best Available Technology Rule (BART)

Background

- In 2005, the EPA finalized the Best Available Retrofit Technology Rule (BART) that directs state air quality agencies to identify whether visibility-reducing emissions from sources subject to BART are below limits set by the state or whether retrofit measures are needed to meet Regional Haze requirements.

Timeline

- KDHE and MDNR submitted Regional Haze Plans to which EPA approved.
- The BART rule requires the states to submit progress reports every five years showing the progress to meet the regional haze requirements.

Compliance Options

- MDNR's Regional Haze Plan relied on the Clean Air Interstate Rule for compliance. No additional emission controls were identified in the Plan for Missouri units.
- KDHE's Regional Haze Plan is a driver for the emission control installation at KCP&L's La Cygne Generating Station.

Industrial Boiler Maximum Achievable Control Technology Rule (Industrial Boiler MACT)

Background

- In December 2012, the EPA issued a final rule that would reduce emissions of hazardous air pollutants from new and existing industrial boilers. The final rule establishes numeric emission limits for mercury, particulate matter (as a surrogate for non-mercury metals), hydrogen chloride (as a surrogate for acid gases) and carbon monoxide (as a surrogate for non-dioxin organic hazardous air pollutants).
- The final rule establishes emission limits for existing units that produce steam other than for the generation of electricity. The final rule does not apply to KCP&L's and GMO's electricity generating boilers, but would apply to most of GMO's Lake Road boilers, which also serve steam customers, and to auxiliary boilers at other generating facilities.

Timeline

- The rule allows three to four years for compliance.

Compliance Options

- Electrostatic precipitator (ESP) upgrades for PM (Lake Road unit)
- Low chlorine coal or DSI for HCL (Lake Road unit)
- Activated Carbon Injection (ACI) for Hg control (Lake Road unit)

Green House Gas Rules – PSD Permitting

Background

- In 2010, the EPA issued a final rule addressing greenhouse gas (GHG) emissions from stationary sources under the Clean Air Act permitting programs.
- This final rule sets thresholds for greenhouse gas emissions that define when permits under the New Source Review (NSR) Prevention of Significant Deterioration (PSD) and title V Operating Permit programs are required for new and existing industrial facilities.
- This final rule "tailors" the requirements of these permitting programs to limit which facilities will be required to obtain PSD and title V permits.

Timeline

- New units and units undergoing major modifications require a PSD permit as of January 2, 2011.

Compliance Options

- CO2 is now a regulated NSR PSD pollutant.
- Any new facility or major modification at an existing facility would trigger PSD permitting requirements if the GHG emission or increased emissions exceed 100,000 tpy CO2e for the new facility and 75,000 for major modification.
- Any new generation facility will likely exceed the threshold and be required to complete a PSD BACT analysis.

Green House Gas Rules – Climate Action Plan

Background

- In June 2013, President Obama announced a climate action plan and issued a presidential memorandum to address one element of the plan which is to reduce power plant carbon pollution.
- The memorandum directs the EPA to:
  - issue a new proposal addressing new units no later than September 20, 2013, which it did, and finalize the rule in a timely fashion;
  - issue proposed carbon pollution standards, regulations or guidelines, as appropriate, for modified, reconstructed and existing power plants by no later than June 1, 2014;
  - issue final standards, regulations or guidelines, as appropriate, for modified, reconstructed and existing power plants by no later than June 1, 2015;
  - include in the guidelines addressing existing power plants a requirement that states submit to the EPA the implementation plans by no later than June 30, 2016; and
  - engage with states, leaders in the power sector and other stakeholders on issues related to the rules.

Green House Gas Rules – NSPS GHG Standards

Background

- In September 2013, the EPA proposed new source performance standards for emissions of CO2 for new affected fossil-fuel-fired electric utility generating units. This action pursuant to the Clean Air Act would, for the first time, set national limits on the amount of CO2 that power plants built in the future can emit.
- The EPA is proposing to set separate standards for certain natural gas-fired stationary combustion turbines (1,000 -1,100 lb CO2/MWh gross) and for fossil fuel-fired utility boilers (1,100 lb-1,050 CO2/MWh gross).

Timeline

- The EPA states it will finalize these standards in a timely manner without providing a date for the final rule.

Compliance Options

- Reliance on natural gas units and efficient coal units with carbon capture and storage.
- New sources would have to comply as soon as the new source performance standard is promulgated.
- Existing units would not have to comply until state implementation plans are submitted and approved.

Water Rules

Clean Water Act 316(b)

Background

- Requires any facilities that utilizes cooling water to use intake structures that reflect “best technology available” (BTA) for minimizing adverse environmental impacts.
- EPA issued proposed rule in April 2011.
- Impingement Mortality (IM) – uniform nationwide standards
- Entrainment Mortality (EM) – site specific considerations allowed

Timeline

- Final rule expected November 2013
- Compliance with Impingement and Entrainment Mortality standards approximately 2018-2020

Compliance Options

- **Impingement**
  - Install fish friendly collection and return systems (new traveling water screens)
  - Meet 0.5 fps through-screen velocity profile
  - Cooling towers
- **Entrainment** – site specific considerations allowed
  - Fine mesh screen upgrades on IM compliant traveling water screens
  - Cooling towers

Clean Water Act 316(a)

Background

- No federal initiative to revise current rule.
- Current driver - State NPDES permit renewals.
- Limits heat rejection to waters of the state.

Timeline

- Possible changes to NPDES thermal limits to more closely reflect temperature standards in state regulations.
- Changes to permit could require cooling towers or unit de-rates during periods of high and/or critical demand on some plants.

Compliance Options

- Maintain existing NPDES permit limits and commit to additional 316(a) thermal demonstrations within the term of the re-issued permit.
- 316(a) thermal and biological studies
- Install closed cycle cooling (cooling towers)
- Unit de-rates

Effluent Limitation Guidelines

Background

- In April 2013, the EPA proposed to revise the technology-based effluent limitations guidelines and standards regulation to make the existing controls on discharges from steam electric power plants more stringent.
- The proposal sets the first federal limits on the levels of toxic metals in wastewater that can be discharged from power plants.

Timeline

- The new requirements for existing power plants would be phased in between 2017 and 2022. The EPA is under a consent decree to take final action on the proposed rule by May 2014.
- The EPA also announced its intention to align this proposal with a related rule for coal combustion residuals (CCRs) proposed in May 2010 under the Resource Conservation and Recovery Act (RCRA).
- The EPA is considering establishing best management practices requirements that would apply to surface impoundments containing CCRs.

Compliance Options

- The proposal includes a variety of options to reduce pollutants that are discharged into waterways by coal ash, air pollution control waste and other waste from steam electric power plants.
- Depending on the option, the proposed rule would establish new or additional requirements for wastewaters associated with the following processes and byproducts at certain stations: flue gas desulfurization, fly ash, bottom ash, flue gas mercury control, combustion residual leachate from landfills and surface impoundments, and non-chemical metal cleaning wastes.

Waste Rules

Coal Combustion Residuals Rule (CCR)

Background

- In 2010, EPA proposed a rule with two options:
  - Regulate as a hazardous waste under subtitle C or regulate under subtitle D.
- Both subtitle C & D require:
  - Liner systems for landfills and impoundments,
  - Surface impoundment design, operation and inspection programs,
  - Location restrictions,
  - Groundwater monitoring, and
  - All existing surface impoundments would have to be either retrofitted with a liner or close in 7 years.

Timeline

- Final rule not anticipate until 2014.

Compliance Options

- Existing permitted landfills can continue to operate but with additional requirements.
- Existing CCR ponds will need to cease operation and closed under the subtitle C proposal. Under the subtitle D proposal the existing ponds could continue if the CCRs are removed and a composite liner installed by about 2020 or closed by about 2022.
- Sluicing of CCRs will cease under the subtitle C proposal but could be allowed to continue with specific requirements under the subtitle D proposal.

Current Estimate of Capital Expenditures

- Current estimate of capital expenditures (exclusive of Allowance for Funds Used During Construction (AFUDC) and property taxes) to comply with current final environmental regulations where the timing is certain is approximately $700 million.
  - The actual cost of compliance with any existing, proposed or future laws and regulations may be significantly different from the cost estimate provided.
  - Current estimate of approximately $700 million of capital expenditures reflects costs to install environmental equipment at KCP&L's La Cygne Nos. 1 and 2 by June 2015 to comply with the Best Available Retrofit Technology (BART) rule and environmental upgrades at other coal-fired generating units through 2016 to comply with the Mercury and Air Toxics Standards (MATS) rule.
  - In September 2011, KCP&L commenced construction of the La Cygne projects and at June 30, 2013, had incurred approximately $311 million of cash capital expenditures, which is included in the approximate $700 million estimate above.

- Other capital projects at coal-fired generating units for compliance with the Clean Air Act and Clean Water Act based on proposed or final environmental regulations where the timing is uncertain could be approximately $600 million to $800 million.
  - However, these other projects are less certain and the timeframe cannot be estimated and therefore are not included in the approximately $700 million estimated cost of compliance discussed above.