UDC 662.613.1(73)+BBK67.625

Part 3

ASH AND SLAG HANDLING

3.7. Analytics

3.7.5. The Changing CCP Regulatory Environment in the United States

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ABSTRACT

Changing and unpredictable air quality control regulations are having a significant impact on electric utilities in the United States. Proposed federal regulations have been rescinded and then re-implemented. Individual states have proposed their own regulations that may conflict with future federal regulations. A recent large ash spill in Tennessee has raised questions about coal combustion product (CCP) safety, potentially affecting many years of successful beneficial use. The current regulatory uncertainty offers a number of challenges to CCP producers and end users.

BACKGROUND

There is a saying that nothing is constant but change itself. In the United States, for nearly eight years, the CCP industry has experienced growth in both production and utilization. When the U.S. Environmental Protection Agency (EPA) determined in May 2000 that coal combustion products (CCPs) should not be regulated as a hazardous waste under Subtitle C provisions of the Resource Conservation and Recovery Act (RCRA) the U.S. industry was enabled to move forward with some certainty from a regulatory perspective. In the year or two leading up to that decision, the electric utility industry, researchers, marketing firms and members of academia provided the EPA thousands of pages of testimony and thousands of samples of CCPs, especially fly ash that allowed the federal government to reach its positive conclusion.

The American Coal Ash Association and others in the utility industry argued strongly against a proposed classification of CCPs as hazardous materials because the impact of such a ruling would have all but shutdown beneficial use. Activists opposed to coal-fueled generation argued the opposite, stating that since coal ash contained heavy metals, it needed to be more strictly regulated. Fortunately, factual decisions were made based on the extensive data collected and evaluated by the EPA. The amounts of heavy metals were determined not to be significant enough to warrant a hazardous determination. The CCP industry compared the amounts of these trace elements to other commonly used products and to those occurring naturally in the rocks and soils of the United States. The comparison clearly demonstrated that fly ash, bottom ash and other CCPs fell within the same range as many soils and were actually lower in many cases than other common products. Nonetheless, anti-coal activists have continued to attack CCPs for many years following the decision.

FEDERAL MERCURY RULES

In 2005, the EPA implemented new mercury regulations (Clean Air Mercury Rule – CAMR) that would require most U.S. utilities to add mercury capture systems to their existing power plants. Annually, U.S. electric utilities release approximately 45 tons of mercury into the environment. This represents roughly 3 percent of the total mercury emitted in the U.S. annually and 1 percent of the global mercury production. Implementation of the regulations was to be determined by operators over the course of the next several years, with full compliance required by 2018. In February 2008, the U.S. District Court in Washington, D.C. overturned CAMR. As a result, many utilities are trying to determine the best way to proceed.

As of the beginning of 2009, at least five states have set up their own rulemaking pertaining to mercury, forcing utilities operating in those states to implement capture technologies to assure compliance to the states' rules. Nearly two dozen more states have proposed or are implementing more stringent mercury regulations that could have a significant impact on the utilities in the near future. On January 29, a judge for the Commonwealth of Pennsylvania overturned that state's mercury rule. He opined that the rule is unlawful, invalid and unenforceable. The two-year-old rule was challenged by Allentown-based PPL Corp., which owns two coal-fired power plants in the state. The company was worried about wasting millions of dollars on pollution control equipment to meet a state standard that may be erased or pre-empted once the U.S. EPA, as expected, writes a new federal regulation to control mercury. It is too early to tell if this decision will have an impact on other state regulations. However, it clearly indicates the complexity of some U.S. regulatory issues.

CLEAN AIR INTERSTATE RULE

On March 10, 2005, the EPA issued the Clean Air Interstate Rule (CAIR) which would achieve the largest U.S. reduction in air pollution in more than a decade. CAIR was anticipated to reduce air pollution that moves across state boundaries. By 2015, CAIR was projected to provide health and environmental benefits valued at more than 25 times the cost of compliance. CAIR would have permanently capped emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x) in the eastern United States and would achieve large reductions of SO_2 and/or NO_x emissions across 28 eastern states and the District of Columbia. When fully implemented, CAIR would have reduced SO_2 emissions in these states by over 70 percent and NO_x emissions by more than 60 percent from 2003 levels and would have resulted in $85 to $100 billion USD (67 to 79 billion Euros) in health benefits and nearly $2 billion USD (1.6 billion Euros) in visibility benefits per year by 2015.

However, in July 2008, the same U.S. District Court overturned this rule, sending the EPA back to their starting point of developing these air emission reductions. It has further (frustrated) complicated electric power generators. Many companies have invested millions of dollars into air emission control systems that now may not conform to new

federal regulations, whenever those regulations are promulgated. Some companies may complete their installations but not operate the equipment. Others may suspend construction awaiting new rules. And others may not even begin construction until federal rules again are finalized, although equipment and contracts have been secured. To further confuse this complicated issue, on December 23, 2008 the same district court temporarily re-instated CAIR. The court said it was persuaded by arguments by the EPA and others, including environmental activists, that "allowing CAIR to remain in effect until it is replaced by a rule consistent with our opinion would at least temporarily preserve the environmental values covered by CAIR." The EPA now must re-evaluate the provisions of CAIR and attempt to resolve the issues in the original court decision that prompted the remanding.

The uncertainty of what new regulations will require in the future offers challenges to producers and marketers alike. For the last three years, there had been some understanding of the potential impact on CCPs of plant modifications to address mercury, SO_x and NO_x. Utilities had anticipated being able to achieve compliance by the installation of new scrubbers or by a combination of factors (such as operating different removal systems for mercury, SO_x or NO_x and fuel switching or fuel blending). Now that federal compliance standards for some air quality requirements have been eliminated ortemporarily reinstated, the confusion grows. States may decide to implement their own air emission regulations without regard to existing systems or planned modifications. Or as demonstrated in Pennsylvania, some companies may chose to challenge state regulations in light of the uncertainty of how these regulations may fit with anticipated federal regulations The capital investments needed to install air emission control or mercury capture systems can be enormous, especially if a number of plants are affected. Even relatively straight forward modifications may cost tens of millions of dollars.

A large holding company with plant operations in multiple states may be required to achieve different levels of compliance across their system, potentially creating procurement and operating inconsistencies. Economic advantages that could be gained by standardized designs and equipment could be lost when different states have different requirements. When federal regulations are expected to cover the same air quality issues, a company could be at significant financial risk if it prematurely selects systems that later prove to be unable to meet the national standards eventually implemented.

In some cases the utility may just choose to delay any modifications until there is more certainty. However, doing this may delay future implementation schedules as other companies may secure fabrication posi-tions for equipment far in advance of other utilities. Others may decide to continue with their planned modifications, and then choose not to operate the equipment, if regulations are not in place at the time of commissioning. The final decisions pertaining to mercury capture requirements or federal and state clean air rulemaking may be several years away, but nonetheless will have a significant impact on the utility sector and CCP management.

THE KINGSTON ASH SPILL

In the early hours of December 22, 2009 an event in Kingston, Tennessee resulted in a huge impact on the CCP industry. The failure of a containment dike at the Tennessee Valley Authority's (TVA) Kingston Fossil plant southwest of Knoxville released nearly 5 million m^3 (6.5 million yd^3) of slurry of wet fly ash and bottom ash into the surrounding areas. Approximately 300 acres (121 hectares) of land and portions of the Emory River were affected by this ash slide.

The magnitude of the spill was enormous when compared to previous events in the U.S. The national media immediately began extensive coverage and referred to the ash as "toxic sludge" and "hazardous waste." National newspapers, such as the New York Times, Washington Post, Los Angeles Times, as well as local TV broadcasts and newspapers in Tennessee, provided daily reports on the spill, its perceived danger, and the efforts employed by TVA to contain the ash and perform clean-up and removal. The company immediately formed an emergency response center staffed by representatives of TVA, Roane County, the State of Tennessee, the EPA and others to coordinate the many issues associated with the spill.

TVA reformatted the home page of their website (www.tva.gov) and posted new data almost daily pertaining to air and water quality, as well as information about public access, frequently asked questions and clean up activities. No injuries resulted from the spill but several homes were destroyed and property damaged. The ash entered the Emory River which is a tributary of the Clinch River and the Tennessee River. The potential impact on drinking water or water treatment facilities was assessed very early on. Environmental advocacy groups rallied to this event and sent members of their organizations to take photographs, collect samples, interview residents, and generally promote the accident as an example of the dangers presented by coal ash and to argue for eliminating coal-fueled power plants. Groups such as the Environmental Integrity Project and Earthjustice prepared news releases and placed information (or misinformation) on their websites to further excite the media. Journalists, reporters and writers often took data provided by these activist groups and reproduced it in print and televised format, without validating the information provided. Numerous examples of exaggeration and blatantly false data were reproduced without thought to the content. As a result, national media created a perception with the public that coal ash is hazardous and toxic and that the local and federal governments have been lax in regulating the industry or protecting the public.

Blame has been placed upon the EPA for failing to regulate coal ash and upon both TVA (a governmental agency) and the state of Tennessee for inadequate oversight of the management of coal ash. TVA is conducting a forensic analysis of the failure and has made public inspection reports of the dike that was examined in February 2008. Coal critics have labeled the event an environmental "disaster" of greater magnitude than the oil spill of the tanker Exxon Valdez in Alaska in 1989. This has triggered calls for federal regulation of coal ash as a hazardous waste and discussions have been initiated by Congressional delegates calling upon the EPA to revisit its determination of 2000.

FEDERAL BENEFICIAL USE SUPPORT

On May 20, 2000, the U.S. EPA handed down a final determination on the management of CCPs that was viewed as a landmark decision at the time. Since the early 1990s, discussions and evaluations had been conducted as to whether or not CCPs should be classified or handled as a hazardous waste under Subtitle C of RCRA. ACAA as well as the electric utility industry argued persuasively that these various materials were safe to use and should not be classified as hazardous. With the Kingston event, the discussion will be taken up again and the utility industry challenged to prove that beneficial use and disposal of CCPs can be conducted in a safe manner without threat to the public. New federal directives are anticipated to be proposed in 2009 that may require possible phase-out of wet impoundments and inspections and evaluations of existing facilities to determine if they could fail in the manner seen at Kingston. This dialogue began in earnest in late January and will continue for months.

The 2000 EPA determination set a new starting point of increased CCP beneficial use in the U.S. In January 2003, the Coal Combustion Products Partnership (C^2P^2) was established by the EPA, the Department of Energy, the Federal Highway Administration, ACAA and the Utility Solid Waste Activities Group. The intent of the program has been to address actual or perceived barriers to increased use of CCPs in environmentally sound ways. An EPA administered website was established (http://www.epa.gov/epawaste/partnerships/c2p2/index.htm) and has become a successful source of regulatory information, case studies and other information about CCP use and management. The U.S. Department of Agriculture, Electric Power Research Institute and the National Ready Mix Concrete Association have joined the partnership as sponsors, adding their expertise and support to this national program. The efforts of this partnership, in conjunction with the broader recognition that the use of CCPs supports sustainable construction, have helped raise beneficial use to almost 43 percent of more than 131 million tons of CCPs produced each year.

IMPACT OF POSSIBLE CHANGES

However, if the federal government were to classify coal ash a hazardous material in some situations (such as for disposal), the industry would see a dramatic decline in use. It is anticipated that end users would no longer permit a "hazardous" ingredient to be added to concrete, placed on the land or incorporated into construction practices. Even if the ash were only treated under regulatory regimes as "hazardous if disposed," lawyers would quickly challenge how a material can be hazardous only in a disposal facility, but not hazardous when used beneficially when the constituents of the ash are essentially the same. Such a classification would, from a regulatory perspective, suddenly create more than 500 new "hazardous waste production facilities" (the power plants generating CCPs) that would be required to manage their by-product stream in "hazardous waste landfills." Besides confusing the public as to what this means to materials proven to have benefit in many applications, it would also necessitate constructing many new or larger "hazardous waste landfills" all across the nation. It may also cause the public to perceive that structures already containing CCPs are now hazardous. In the case of fly ash used in concrete, the measurable CO_2 emission offset gained would be eliminated if categorized as a hazardous material, eliminating the approximately 15 million tons of CO_2 reductions seen annually. Because nearly half of the concrete placed in the U.S. each year uses fly ash to improve performance, eliminating fly ash as a supplementary cementitious material would reduce the quality of a large amount of concrete.

Conjecture is that coal-fueled power plants simply would not attempt to use CCPs in beneficial ways any longer. To do so might put a company at risk as a result of future lawsuits requiring the removal of any "hazardous waste" from building sites, land applications, roadways, etc. In that the science does not support such a classification even if in an impoundment, other means must be found to address the environmental concerns that have been raised again by the ash spill. One scenario would be phasing out wet impoundments over a period of time, based upon their current structural integrity as proven by inspection and geotechnical evaluation. Furthermore, the conversion of wet handling systems to dry handling methods could be required. The construction of landfills for CCPs would possibly require liners and groundwater monitoring as well as post closure financial assurances.

CONCLUSIONS

These regulatory changes related to mercury capture, air emission controls and disposal issues will evolve over the next year and could have a significant impact on the CCP industry. Logically, more stringent disposal requirements could actually have a positive impact on beneficial use by encouraging greater use to avoid disposal. This is only likely if there is no change to the classification of CCPs to a "hazardous" listing.

Unfortunately, at the time of writing this paper there is much uncertainty as to what decisions may be made by the federal government and what the states themselves will do given the large amount of media coverage that has included misperceptions and misinformation. We can only hope that fact based science and decision making will prevail and that political science will not trump the genuine environmental, economic and social benefits that come from using CCPs.