

Compliance Experience of Regulated Entities

John McManus – American Electric Power

I grew up in upstate New York, went to college in upstate New York. While I was in college, I climbed a fair number of the high peaks in the Adirondacks. When I came to graduate school in 1976 and I read some of the early papers by Gene Likens and Ellis Cowling on this issue of acid rain, it looked like an interesting topic to do some research on, so that is what I worked on.

I learned a few things in graduate school, one being that trying to collect siltation samples without contaminating them is a tricky thing to do when you don't have a budget, which I didn't as a graduate student; that I am not very good as a laboratory chemist; and that acid rain is a fairly complex issue.

Twenty-five years later, we are still here talking about it, which suggests something else to me, that I may still have some employability with my company, because I know a little bit about this issue.

Looking at it from an industry perspective, some of what I will say you have already heard from Dr. McLean, because we are talking about the same program.

My company's experience on this is not a whole lot different than the industry in general. Some of the things that I say apply to a lot of companies in terms of things that we did in the 1980s, and the compliance measures that were taken in the 1990s. So, it is not just American Electric Power [AEP] that you will hear about here.

A little background on AEP, for those who aren't familiar, we operate in 11 states as a result of a merger that was completed last year with Central and Southwest Utilities. We have coal fired power plants and natural gas power plants, primarily in the mid west and in the middle south.

I will just give a few quick statistics which are somewhat relevant to this. We generate a fair amount of electricity. We have about 38,000 megawatts of capacity, of which 25,000 is coal, which is directly relevant to this issue.

Most of the coal capacity is in the mid west, about 20,000 megawatts of it, with the rest in Texas, Oklahoma and Louisiana. We have 4.8

million customers. We have a transmission distribution system, and 2000 revenues of about \$13.7 billion. So, we are a fairly large utility, which is not a real surprise.

Getting more direct to this issue, our perspective on acid rain, AEP started to become engaged in the issue in the late 1970s, as it started to become both a scientific and a policy issue. That was not just a coincidence. That is when I started working with AEP and told my management, you should pay attention to this.

In the 1980s, we sponsored a fair amount of research on acid rain, as did the industry in general, through the Electric Power Research Institute. One particular project that we did was called the Utility Acid Precipitation Study Program, which was pretty much the state of the art precipitation program at the time.

It used many of the same techniques to collect and analyze precipitation as did the National Acid Deposition Program, but the UAPS program was actually a daily monitoring program and not a weekly program.

UAPS collected a fairly extensive database, primarily in the eastern part of the country, of daily precipitation chemistry, which allowed for a fair amount of analysis on what really drives the chemistry, more so than a weekly sampling program did.

AEP was active in a program called Living Lakes, which was looking at the concept of actually liming acidified lakes in the Adirondacks to get some immediate benefits, recognizing that an emission reduction program would take quite a bit of time before you would actually see a response in the ecosystem.

We closely followed the NAPAP program in the 1980s, and were actively engaged in the development of Title IV and eventually the regulation.

Once the allowance program was introduced and utilities started to get a better understanding of the concept of allowances and the value that they had, it became a real free-for-all to get as many allowances as possible.

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Interestingly, I think the original bill that was introduced from the first Bush administration only affected sources above 1.2 pounds per million BTU, and the cleaner sources I don't believe are in the allowance program. Many of those sources were in the western part of the country, but it was still intended as a national program.

As those western companies realized that they were going to be left out of the allowance program and that new power plants would have to have allowances, everyone decided that they wanted to be part of the program. That was an interesting response, because usually companies like mine looked for ways to get out of these kinds of programs.

The introduction of the market approach and the allowance concept really did change the dynamic of this considerably. Once Title IV was passed and the regulations began, AEP, as well as a number of other utilities, were able to work with Dr. McLean's group on their acid rain advisory committee.

Looking at how we actually have complied with Title IV, the initial focus was on a self-sufficient compliance plan, and this was true of almost every single utility in the country, with the exception of one that I can think of.

Because the market concept was new, no one knew how active it would be, whether allowances would be readily available to use for compliance. Every company looked at ways to comply just within their system. So, the market itself did not play a significant role as a compliance tool, at least during most of Phase I.

For a company like AEP, which had at the time about 45 coal-fired units scattered across five states, the ability to use allowances for our system provided a tremendous amount of flexibility. Just being able to move allowances and develop a system-wide compliance plan for our own units, regardless of the rest of the market, resulted in a significant cost savings.

It did lead to some complexities. At the time, all of our states and all of our plants were regulated by state rate commissions, and each state had a different perspective on how they thought allowances should be handled and how allowances should be accounted for, as they moved across state lines.

The result of that is, we have, at AEP, a very complex approach to how we have to account for allowances. Dr. McLean may not know this so much, but I know there are some people who work in his division that I think hate AEP, because of the number of allowance transfers that we have to send to them when we are doing compliance or any allowance trades.

The allowance system is a great approach. It does have some underlying issues that, looking to future programs, hopefully could be handled in different ways.

The actual compliance steps that we took in Phase I were a combination of pollution controls, different fuels and using allowances. We put scrubbers on one of our largest plants in Ohio at a cost of a little over \$600 million, did some fuel switches to lower sulfur coal. We converted three units to have the capability to burn natural gas, which we tested for about one month and have never used since then, especially when gas prices went to \$10 this past winter. It is not a cost effective compliance measure.

When we look at Phase II, compliance, at least initially, will be through fuels, looking at different mixes of low and medium sulfur coal, and drawing down allowances from the bank that was built up during Phase I.

We don't anticipate putting scrubbers on, at least in the near term, and I don't think there have been many scrubbers at all installed in the industry as a Phase II compliance measure yet.

NO_x is part of the program. As has been pointed out, it was not the major focus of Title IV, and it was directed at combustion-type controls, not retrofit controls, or post-combustion controls.

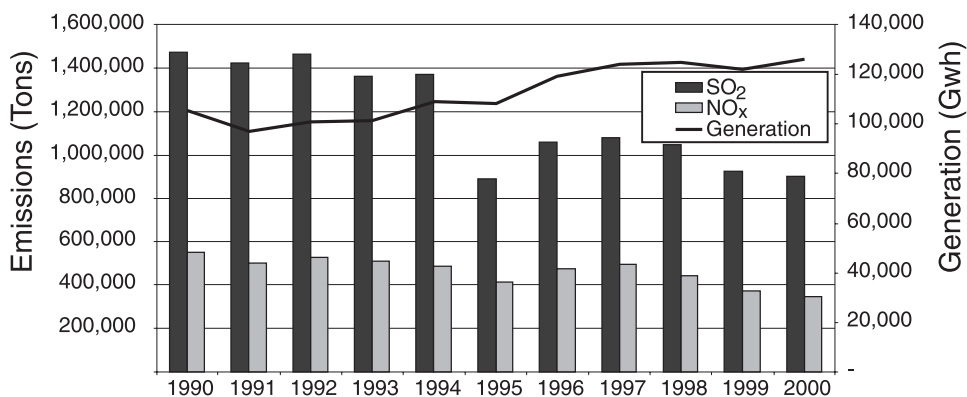
We have installed low NO_x burners or essentially the equivalent of that on every one of our boilers to comply with the NO_x provision.

The result of this, you can see the reduction in SO₂ that occurred between 1994 and 1995. That was primarily a result of starting up the scrubbers on our Gavin plant (Slide 1).

You then see that SO₂ emissions on our system went up for a couple of years, and then it is starting to gradually come down.

That increase, I think, is a direct result of the allowance market. If you recall the allowance price graph that Dr. McLean put up, allowance prices

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Slide 1. AEP East Emission Trends 1990-2000.

dropped significantly after 1995, hit a low in 1996, and then have gradually come back.

The coal market and the allowance market are directly interrelated. As allowance prices dropped, it became cost effective to look at higher sulfur coals, which even with the cost of sulfur embedded in them, became economical choices. I don't know if this type of result is reflected in the broader industry numbers, but we saw some direct relationships with the market price in our system.

NO_x reductions are much more modest. Again, the target for the program was more modest and at AEP, at least, we had very few units that were affected by the Phase I NO_x program. Now that we are in Phase II, all of our units have NO_x controls.

Now, where do we go from here? When you look at the Title IV program as well as some others, it is important to remember that there are still significant reductions in the pipeline.

There is a large bank of SO₂ allowances that was built up industry-wide during Phase I. That bank will gradually be drawn down.

The Title IV Phase II cap, if you look at it on an emission rate basis, people tend to think of it nominally as a low sulfur, 1.2 pound per million BTU program.

Because it is a cap, and because there has been a significant amount of growth since the mid-1980s, which was the baseline for the program, it effectively is, we think, about a 1.8 to 1.9 pound per million BTU program.

It is more stringent than people think it is, once the bank of allowances is used up. When you

look at what fuels you could use for coal for compliance, to stay within that emission rate, you would effectively have to convert every coal unit to Powder River Basin coal, which isn't practical and isn't economical, and has a whole host of political implications for some of the states that we operate in.

We don't expect that to happen. What it says, though, is that there will have to be additional scrubbers installed under the Title IV program to stay within this cap, sometime in the next few years.

Looking at NO_x, the Title IV target was somewhat modest, but we do have another program starting now in the east, the NO_x SIP CALL.

We started up just this past week, SGR Systems, at our Gavin Plant. In at least the first few days, they are achieving 90 percent reduction in the NO_x emission rate. We, as well as many other utilities, will be installing additional NO_x controls. So, there is a lot of NO_x reduction that will occur in the next two to three years.

Just to point out, again, a value of a market-based approach, especially when you have built some incentives into it, the reason we started up our Gavin SGR systems on April 30 is that, starting May 1, we can earn early reduction credits as an incentive.

There are other regulatory programs that Dr. McLean's agency is working on that will directly affect sulfur, nitrogen and mercury emissions in the next few years, at least in this decade.

When you look at acid rain as an issue, do new

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research findings justify additional controls? The Hubbard Brook Research Foundation put out this report a month or so ago. It is very nicely done. As I went through it, I had a sense of *deja vu*. I didn't see a whole lot in there that I thought was really new.

It was a good summary of a lot of information that I felt was understood in 1990 when NAPAP issued its final report.

So, it raises a question as to whether we are going over a lot of things that we already knew, or how much is really new, and that is one of the purposes of this conference and there should be some new information presented. The idea that it will take decades to see recovery of some of the aquatic systems in the northeast is something that was understood by NAPAP.

I guess I would argue that Congress designed the program with that understanding. Congress made a policy decision in 1990. Is it appropriate to revisit that policy decision now and change the program? That is an important question that will be looked at, and it raises the question of the potential for legislative action.

There is a lot of discussion on three pollutant bills, and three pollutant plus carbon bills. What are the realistic expectations that Congress will do something to change the Clean Air Act and address some of these problems in a more coherent coordinated fashion?

It comes down to what we think is the main question. Do we expect another 10 years of debate like we had in the 1980s? I certainly don't expect that. The real question, when we look at the existing fleet of coal-fired power plants in the country and what we do with them, is how much reduction do we want and how fast do we want it?

I think that is where the debate will be in the future, I am not sure how long it will take, a year, a couple of years.

We would hope that ultimately what is decided relies on market mechanisms. We think that the allowance program has been a tremendous success. It provides a lot of flexibility. It is obvious that it reduces costs and it is easy to administer.

Working with Dr. McLean's division on this program, although there are some issues where we have had some differences, it has been a very easy program, from our perspective, to administer. I

won't say it has been a dream, but it has been much easier than some of the other environmental programs that we have.

So, market mechanisms allow, from an administrative perspective, a fair amount of simplicity as well. With that, I will take questions.

QUESTIONS

AUDIENCE: Isn't the trick to get the old clunkers off line and replace them with new, cleaner sources? How do we see that best acted?

MR. MC MANUS: I guess I take issue with old clunkers. We have some of our units that were built in the 1950s that have some of the best heat rates of any units on our system. For coal fired units, they are very efficient.

AEP in general, as a fleet, has one of the best average heat rates of any company in the country. We have some very good units that are older units that are very economical to run. So, I wouldn't consider them clunkers.

Should we be replacing them quickly or over time is the question. How fast do you do this?

There is a tremendous debate going on right now on energy. The energy systems in this country in the last year or so have gone in a direction that people didn't expect. Natural gas prices, gasoline prices, the electricity market in California, the coal market in the east, all have seen significant shifts.

The role that rail deregulation played in keeping allowance prices low is an important role, because it forced low sulfur coal providers in the east to keep prices down. That is changing now. Coal is in short supply, whether low or high sulfur, and we are seeing that reflected in allowance prices.

There is a major energy policy issue here. How quickly do we want to convert to a more efficient energy system? How much do we rely on coal? Is that something you can do in a short period of time? That is what we think is a key part of the debate. The idea of old clunkers and grandfathered power plants, we tend to disagree with that perspective. Especially when you look at Title IV, every coal plant in the country is now regulated for sulfur dioxide and nitrogen dioxides.

Granted, they are not as clean as if you built a brand-new power plant, but you can't turn over the fleet of power plants that provided over half the

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electricity that this country uses in a short period of time. It is just not practical.

AUDIENCE: Focusing on NO_x, I think it is a bit disingenuous to say that the Congress decided in 1990 not to pay a whole lot of attention to nitrogen. There was a widespread view that nitrogen wasn't so much of a problem because, after all, it was a useful fertilizer.

We have seen that that really isn't the case any more, both in the Chesapeake Bay, the job we did last year on the Adirondacks and other places. Even the SIPCALL and Section 126 stuff is not putting a cap on nitrogen. If 50 percent on sulfur is of questionable sufficiency, in the views of at least some, is 10 percent on nitrogen even a serious bite?

Then also on nitrogen, people probably know about the ozone formation study that was published in Science this past week, which raised the unfortunate problem that small flues are much higher producers of ozone than large flues, which sort of protect the NO_x from being converted into ozone.

The article didn't bother to mention that it protects it from being turned into ozone by turning it more into nitrate, which is nitrate deposition.

It looks like not only may there be a substantially greater need for NO_x control than has been done so far, but also that it may be more difficult.

MR. MC MANUS: Just a couple of comments on that. I am not sure that was a question as much as some useful insights.

I think Congress did place less emphasis on nitrogen in 1990. It was almost sort of an afterthought, because the debate in the 1980s was on sulfur.

The title IV NO_x program is a modest approach. It is combustion controls. It has reduced AEP's nitrous oxide emissions by about 25 percent, which is not as much as we get with SO₂.

The NO_x SIPCALL program is a fairly aggressive program. Granted, it is only in the summertime for five months. It does cap effectively emissions in those five months. For AEP, we will have to reduce our emissions in that five-year period by another 75 percent, on top of what we have done for Title IV. So, on an annual basis, that

is still a fairly significant reduction in NO_x emissions.

When you look at the power plant sources of NO_x, in comparison to other sources, before the NO_x SIPCALL program, power plants contributed probably between 20 and 25 percent of total NO_x emissions in the United States.

With the reductions we have seen in the east for the SIPCALL, that is going to go below 20 percent – I am not sure how far below.

Transportation sources, which are now over 50 percent, will be, as a percentage, even higher.

If we really want to focus on nitrogen oxides, it is going to be important to look at more than just power plants.

It is not that you can't do more with power plants, year round versus just in the summer, but it may not get the benefit you think, when it is a smaller contributor to total NO_x than it was in the past.

MR. BENNETT: Ed Bennett with New York State. Just one question on the enforcement of the major modification provisions of the act and how this would play out with the Title IV provisions, could you comment on that?

MR. MC MANUS: I am not sure of the question.

MR. BENNETT: It is getting to the older units and the major modifications occurring with them, making them live forever. Like you say, they do operate, they operate well and they are 50 years old.

MR. MC MANUS: Specifically as it relates to the litigation brought by the Federal Government, New York State and some others, because it is active litigation, I am not going to say a whole lot about that.

I guess I would take issue with major modification versus routine maintenance. Certainly what we have done has been consistent with the regulatory program.

We fully have understood that program, and having worked in our environmental department for my 24 years with AEP, I know, as we considered what we did at our power plants, as we considered new plants, we did it all within the context of that regulation.

That will play out eventually in the next year or two, and we will see where that takes us.

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