

Delaware Air Regulation Development

Regulation 1142 Section 2 “Control of NO_x Emissions from Large Boilers and Process Heaters At Petroleum Refineries”

Committee Meeting #2 Minutes

April 19, 2006

(Approved by the committee in the third meeting on June 21, 2006)

1. Committee members present

John Deemer, Premcor’s Delaware City Refinery
Kevin Stewart, American Lung Association
Pete Jacoby, Power Tech Solution
Mike Gansner, Environmental Resources Management
Alan Muller, Green Delaware
Jerry Llewellyn, DHSS
Rick Perkins, DHSS
Ron Amirikian, AQM
Ravi Rangan, AQM
Bill Harris, AQM
Bruce Steltzer, AQM

2. Meeting Minutes

Ravi Rangan opened the meeting with introductory remarks.

The first item that was discussed was the minutes from the first meeting. John Deemer indicated that the minutes did not reflect his thought that CO boilers should be excluded from the regulation. Kevin Stewart indicated his thoughts on this topic were also not included, and questioned whether there were other definitions that we could look to see if they should be in or out. Ravi Rangan indicated that the CO boilers are large sources and the Departments intent is to include them. Ravi said the minutes of the second meeting will incorporate John’s comment. John stated that he will cover this in more detail in his presentation. Following this discussion the minutes of the first meeting were finalized.

Next, follow-up questions resulting from the first meeting were discussed. First Kevin questioned the 0.04 lb/mmbtu limit in the Departments presentation. Ron Amirikian explained that 0.04 was not a final number, and that this committee would help the Department determine the appropriate number to be in the regulation. Once the number is determined the Department would use it to calculate the resultant emission reductions. Ravi added that its basis is 1999/2000 consent degree (CD) negotiations, that 8-years have passed since these negotiations, and that it was a good starting point. This was discussed in more detail following John’s presentation.

Kevin indicated he understood, and asked whether any form of modeling was used to support the desired reductions. Ron responded that states have used modeling since the inception of the 1990 CAAA, but this has turned out to be a failed approach. As a result, congress mandated a strategy to use mandatory 3 % per year reductions as a hard number that will give reductions (i.e., rate of progress (ROP) reductions). Then, as a second step, modeling would be done to determine if additional reductions beyond ROP would be needed. Preliminary modeling indicates we will still be in non-attainment after implementation of all federal measures, and after ROP. Kevin said modeling has evolved a lot since the early 1990s and that even if modeling shows no progress, we need to move forward. The discussion then shifted to a basis for a benchmark cost effectiveness threshold. Ravi indicated that during the development of the CD \$10,000/ton was used as a benchmark to assess cost effectiveness.

Alan Muller noted that NOX is a harmful pollutant and that we need to set the limits in this regulation to the lowest limits that can be accomplished. He indicated that if an emissions rate lower than 0.04 is possible than we should aim for that lower number. Alan questioned the \$10,000/ton threshold, indicating that many EPA studies indicate that health benefits usually significantly outweigh control cost. Gerry Lewellen indicated that EPA probably has health risk numbers on NOX based upon it's concentration in the ambient air. Kevin agreed that EPA cost/benefit analysis done by EPA usually provide mortality, lost work days, etc. John stated that the EPA has used this type of data in national rules, and it would not be appropriate to use them in this case. He indicated that the purpose of this rule was the ozone SIP and it should be based upon cost effectiveness of the controls. Mike Gansner agreed that he understands the purpose of this regulation to be the ozone SIP. Ron agreed that the purpose of this rule is the ozone SIP, and clarified that it was to help with RFP, attainment and maintenance requirements. Meeting these goals will inherently improve/benefit public health. Ron also explained that reductions in NOX emission will help with Delaware's PM2.5 and regional haze SIPS. Alan indicated that the refinery is a large emission source, and that people live around the refinery, and that local as well as regional impacts must be considered. John reiterated the purpose of the regulation is attainment of ozone NAAQS, and Ron added that it RFP and maintenance of the ozone standard, and PM2.5 and regional haze are also why we are developing the regulation.

Kevin indicated that in meeting the ozone standard a single facility may only contribute a small amount to the overall problem; it may be lost in the noise. Ron agreed that it is difficult to relate reductions a individual facilities to ppb decreases in ozone. Kevin talked about how models have gotten better over the years, and that we are now seeing the benefits of the programs like the NOX SIP Call. While the models are getting better, Kevin indicated that modeling is not our only tool.

Kevin indicated that AQM is approaching this regulation from the wrong direction. AQM should first set a reduction goal in terms of tons of NOX, then determine an appropriate emission rate.

Alan talked about our experiences with mobile sources, and how he viewed the regulation of them as more of a paper exercise. He indicated that the bottom line is that DE has been in non-attainment for a long time for ozone, and that now DE is also in PM2.5 non-attainment. He stated that the sources we are talking about here are very large sources, and that tightening the screws on them should be the objective of the committee. He stated that he hopes the refinery will do everything possible to clean up its operations. He stated that the refinery can afford to do this. Ravi stated that the discussions along this likely will lead us to Kevin's next follow-up question. He talked a little about control of individual units versus averaging, and indicated that he believed John's presentation would get into this. John agreed that he will cover this in his presentation.

The next topic was the role of the consultants on the committee. Alan questioned who ERM was representing. Mike indicated that ERM represents Sunoco, Valero, and other refineries across the nation. He indicated that on this committee they are paid by no one; that they are here to gain insight and to add to the discussion where they can. Alan was concerned that if they are representing the refiners the committee would be balanced in favor of the refinery. After some discussion Ron indicated that the purpose of the committee was an advisory group to aid the Department in the development of the regulation, and that the Department will not be taking action based on any type of vote or consensus.

Next, Ravi briefly covered the information on the Departments website, and moved the discussion to John Deemer's presentation. John went through his presentation, and indicated that he will email an electronic version to Ron. Ron stated he will email out to committee and post on the Departments website.

Following the presentation Ron indicated questions could be asked of John's presentation, and then we could move to discuss some of the many questions in John's presentation. Kevin indicated that many of the questions were fair, and asked if the Department had reviewed them in advance. John indicated the Department asked him for advance copy but unfortunately the timing didn't allow for it.

Ravi indicated that control of some of the units would present challenges. He brought up 37-H-1, which is a heater with approximately 500 burners. Kevin questioned how John got the control costs for this unit, and he indicated it was based on ultra low NOx burners being available, and all 500 burners being replaced by ultra low NOx burners. Alan brought up that burner replacement was not the only control option, and that in this case it may make more sense to look at stack controls. John agreed they had not looked at this due to timing, and that it may be a better possibility. John indicated that he would try to get some \$/ton information for ULNB, SCR and SNCR for the next meeting.

John indicated that the numbers in his presentation were based off a 2003/4 baseline. There was some discussion, and Ron indicated that the CAA and EPA SIP rules require planning for the 8-hour standard to be based off a 2002 base year inventory.

Kevin questioned why the CO boilers were better regulated on a ppm basis instead of a lb/mmbtu basis, and Ravi explained that the sensible heat made the lb/mmbtu basis more difficult to handle. There was discussion that a correction to stack oxygen levels would ensure actual reductions would occur on a ppm basis.

Ravi summarized that the problem units would be boilers 3 and 4, 37-H-1, 42-H-1,2,3, and the coker CO boiler. John explained that 42-H-1,2,3 was the reformer heater, which had 3 cells and common convection, and a single stack. He explained that boilers 1 through 3 were identical, but that boiler 3 presented some challenges as it burned syn-gas in addition to refinery gas. He indicated boiler 4 was different in that it was built by DELMARVA Power at a later time than boilers 1 through 3.

John talked about low-tox control on the CO boilers. He indicated that it will create some problems with the new, state of the art scrubbers, and was not a proven technology. The Coker WGS is under construction and the Cat Cracker WGS has not yet begun construction. Significant modifications would be needed on the WGS if LoTOx were to be used. Furthermore, LoTOx is not yet a proven technology. Alan questioned this, indicated that he heard John to be saying that they can't install it on the coker CO boiler because they installed it on the cracker CO boiler, which didn't make sense to him. John clarified that the cost to install it on the coker is about \$45mm dollars, that there are challenges with the technology, and that they shouldn't have to modify both state of the art scrubbers. There was some talk over how 20ppm converted to a lb/mmbtu limit, and Ravi and John agreed that it was about 0.09 to 0.1 lb/mmbtu. Ravi said the Department is presently engaged in meetings with the refinery to see what additional controls could be implemented on the FCCU CO boiler as an interim measure (i.e before it is upgraded with LoTOx controls) and asked John whether a similar option had been evaluated with respect to the coker's CO boiler. Ravi also asked whether these additional measures could bring the coker CO boiler NOx levels to comparable levels. John indicated that other controls were a possibility but they had not been evaluated for this meeting. John said he would look at this aspect and provide an update Ravi asked for more input on this. Peter Jacoby indicated that each unit is different, and that 0.04 lb/mmbtu limit across the board would be a challenge. Kevin brought up the potential of creating a cost versus #/mmbtu curve for each unit. Kevin also indicated that an independent evaluation of this information would be of benefit. Ravi indicated this was all an excellent point, and offered that MARAMA would have some of this information in a refinery study they are putting together. He indicated the study would not be unit specific but will have benchmarks based on evaluation of the various controls in the refineries in the MARAMA region and on the controls installed by refineries that are implementing the CDs. . There was agreement that this would be a great idea, but Peter questioned the effort needed. Peter indicated that a similar analysis on boiler No. 2 took about a year. Kevin talked about how we could compare ranges instead of points to simplify the analysis. John talked about how Premcor goes thorough various "gates" on estimating cost, with successive gates yielding better data at a higher cost of getting the data. Allen talked about the auto industry, and how nothing would have happened if congress had not required it. Alan compared a 0.04 limit with a 0.06 limit, indicting that the higher limit was 50% higher, and that DE citizens would have to live with it for a long time.

There was some historical discussion about how boiler 1 and 2 were slated to be shut-down, but instead they were not and through enforcement were not subject to a 0.04 limit. Alan stated they should have been shut-down as originally planned, and that this is another reason we need to tighten the screws on them now.

There was some discussion on other actions the Department was taking to attain/maintain the ozone standard, to include a multi-p regulation, lightering regulation, peaking unit regulation, and large boilers at other than refineries regulation. Ron also indicated that we were working with other states on regional strategies.

There was some discussion on whether tier II was included to help with the needed RFP reductions. Ron indicated it was, and that we expected mobile reductions to help by about 10 to 11 TPD. Ron indicated the RFP SIP is due to the EPA in June 2007, and that the Department will put together some information on RFP at a future meeting. John asked whether the Department could provide a breakdown of the 78.1 tons per day reductions. Ron said we could do that. Ravi asked John whether he had made any headway with regard to potential VOC reductions that John had alluded to in the first meeting. John said they are still looking at that but do not think it's likely.

John acknowledged that it may be feasible to control some units to levels below 0.04 to average all applicable units to the 0.04 lb/mmBTU emission rate.

John indicated that he will try to have some more analysis of technology by unit and cost effectiveness data for the next meeting. Following this Ravi concluded the meeting.