

soaking emissions, and each plant should address all aspects of safety. We do not believe that the revised standard jeopardizes the safety of plant workers.

We agree with the commenters that the proposed standard would have imposed unnecessary administrative burdens related to soaking emissions. Accordingly, we have eliminated the requirement to document the ignition of soaking emissions every time an oven is damped off the main. Instead, plant owners or operators must prepare and operate at all times according to a written work practice plan for soaking.

#### *G. What Changes Did We Make to the O&M Requirements?*

*Comment:* Several commenters suggested changes to the general batterywide O&M plan. One comment was to delete the requirement to measure or compute the air:fuel ratio. They noted that the air:fuel ratio is not normally measured, and it would be impractical to do so given that it would require flow measurements of every oven's air box and gas orifice to calculate the air:fuel ratio. Another commenter asked that the requirement for procedures to prevent pushing an oven out of sequence be deleted. The commenter argued that any oven placed on extended coking would of necessity be pushed out of sequence. Another comment was to delete the requirement for procedures to prevent undercharging an oven because it has no effect on emissions. In addition, procedures for measuring the volume of coal are not appropriate because many plants calculate coal volume rather than measure it.

*Response:* We agree that it may be impractical to measure air:fuel ratio since it is a calculated value at most plants. Different parameters may be monitored at different plants to ensure the underfiring system is operating properly. Consequently, we have written the final rule to require that the O&M plan include the frequency and method of recording underfiring gas parameters. We are also clarifying the pushing an oven out of sequence requirement. Our intent is to prevent an oven from being pushed ahead of schedule before it is fully coked. We have added language to the final rule that clarifies this intent. Relative to undercharging an oven, we disagree with the commenter that undercharging does not produce emissions. Our research and discussions with coke plant operators indicate that undercharging an oven can produce excess carbon on oven walls, which can result in pushing difficulties and excess pushing emissions. Consequently, we

are retaining the requirements for procedures to prevent both undercharging and overcharging ovens in the work plan. We understand that not all plant owners or operators measure the volume of coal; some calculate the volume from weight and bulk density. We have written the language in the final rule to require procedures for determining coal volume rather than the measurement of coal volume.

#### *H. Why Did We Change the Compliance Dates for Existing Sources?*

*Comment:* Several commenters said 3 years should be allowed to achieve compliance. They note that we provided no rationale for providing for only 2 years to comply and should give the full 3 years allowed under the CAA. Two years may not provide enough time because of the substantial work that must be done at many plants, and it may be difficult to raise the necessary capital to make the batteries compliant.

*Response:* The CAA requires that compliance occur as expeditiously as practicable, but no later than 3 years after the effective date of the standard. (See CAA section 112(i)(3).) We agree with the commenters that many batteries will require extensive repairs in order to comply with the final rule. As a result, we have written the final rule to provide the 3 years allowed under the CAA. We estimate that 23 batteries will need major repairs (oven patching, endflues, and through walls) with capital costs of \$2.4 million to \$9.3 million per battery. In light of the cost and time required to complete necessary repairs at many facilities, we believe that a period of 3 years is necessary in order to allow sufficient time for all existing facilities to meet the requirements of today's final rule.

### **IV. Summary of Environmental, Energy, and Economic Impacts**

#### *A. What Are the Air Emission Reduction Impacts?*

Accurate emission estimates are difficult to make, especially for fugitive pushing emissions. When green pushes occur, most of the organic HAP escape the capture system and are unmeasurable. Our estimate for pushing emissions is based on our best estimates of the capture efficiency and frequency of green pushes. For battery stacks, we have opacity and emissions data for the best-controlled batteries. We had to extrapolate the test data to account for higher emissions from batteries with higher battery stack opacities.

At the proposal stage, we estimated that coke oven emissions, measured as

methylene chloride extractable organic compounds from pushing, quenching, and battery stacks, would be reduced to approximately 500 tpy from a baseline level of about 1,000 tpy. However, six coke plants have permanently closed since proposal. Our current best estimate is that baseline emissions of 680 tpy will be reduced to 390 tpy. The final rule will also significantly reduce emissions of other HAP, such as metals, benzene, toluene, and other volatile compounds that are not included with the extractable organics. However, we do not have a reliable means of estimating the overall reductions of these other HAP emissions. Today's final rule will also reduce emissions of PM.

#### *B. What Are the Cost Impacts?*

As with the emission estimates, there is some uncertainty in the cost estimates. However, we obtained data from the best-controlled plants for their emission controls, oven repairs, and work practices. After proposal, we collected additional information on the extent of repairs needed and their costs. We then applied these costs to those batteries that we project would be impacted by the rule and developed revised cost estimates. We estimate that 23 batteries may require major repairs and could incur aggregate capital costs of \$2.4 to \$9.3 million to rebuild ovens to meet the final standards for pushing and battery stacks. Relative to add-on air pollution controls, we believe that three batteries will have to install baffles in their quench towers to control quenching emissions. We do not believe that any plant will need to upgrade or install new control devices to meet the final PECD standard.

Monitoring is also an important component of MACT and the cost estimate. Approximately 20 batteries will need to install COMS on their battery stacks. In addition, 44 batteries are expected to incur the cost of visible emissions observers for daily observation of pushing emissions, and 18 bag leak detection systems must be installed. The cost of control and monitoring associated with the above measures is expected to result in nationwide capital costs of about \$90 million and total annualized cost of \$20 million per year.

#### *C. What Are the Economic Impacts?*

We conducted a detailed assessment of the economic impacts associated with the final rule. We expect the compliance costs associated with the final rule to increase the price of coke, steel mill products, and iron castings and to reduce their domestic production and