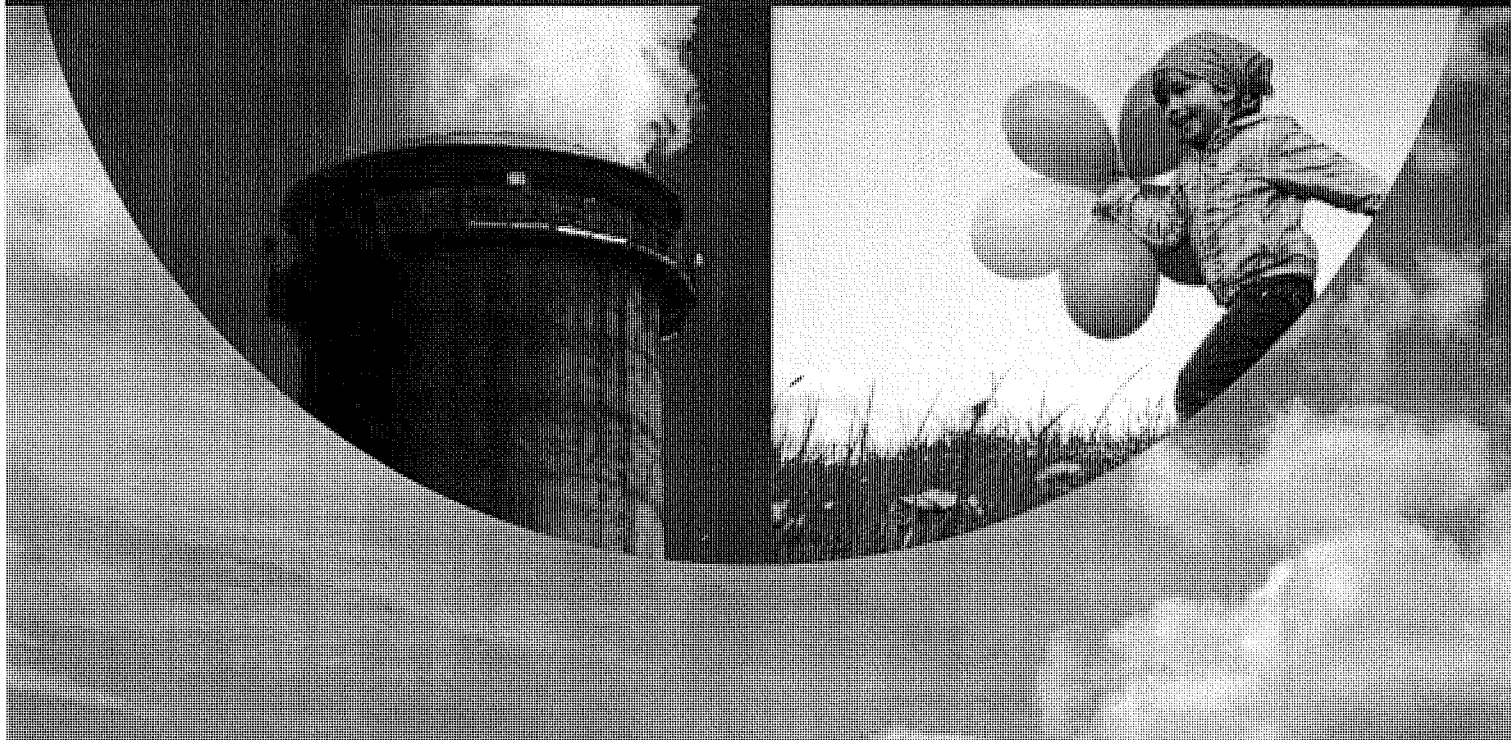


Reliability-Only Dispatch

Protecting Lives & Human Health
While Ensuring System Reliability



BY JOHN HANGER

CLEANAIR
TASK FORCE

ABOUT THE AUTHOR

John Hanger is a nationally recognized expert on gas drilling, the green economy, environment, and energy issues. He has broad experience in government, regulatory agencies, and in the private sector. Mr. Hanger served as the Secretary of the Pennsylvania Department of Environmental Protection from 2008-2011. Mr. Hanger was the founding President of Citizens of Pennsylvania's Future (PennFuture), Pennsylvania's leading public interest organization working to improve the environment and economy. Mr. Hanger also served as Commissioner of the Pennsylvania Public Utility Commission from 1993 to 1998. He was the architect of Pennsylvania's successful law that ended electric generation monopolies and allowed consumers to choose their electric generation suppliers or build their own power supply. He is a 1979 honors graduate of Duke University and a 1984 honors graduate of the University of Pennsylvania School of Law. He also has formed Hanger Consulting, LLC.

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ABOUT THE CLEAN AIR TASK FORCE

Clean Air Task Force is a nonprofit organization dedicated to reducing atmospheric pollution through research, advocacy, and private sector collaboration. CATE is funded exclusively by philanthropic grants and donations and accepts no corporate or government funding.

For this report, the Clean Air Task Force assessed the health damages associated with possible compliance extensions under the proposed Utility Air Toxics Rule using Abt Associates' Powerplant Impact Estimator, or PIE model, which was developed for CATE to help estimate the human health and associated economic benefits of air pollution reductions.

EXECUTIVE SUMMARY

Mandated under the Clean Air Act (“CAA”), the coal- and oil-fired electric utility Air Toxics Rule creates the first ever national limits on power plant air emissions of mercury, arsenic, hydrochloric and sulfuric acids and other hazardous air pollutants (“HAPs”). The U.S. Environmental Protection Agency (“EPA”) estimates that the Rule, which will be finalized in November, will provide the nation massive health benefits each year by preventing 6,800 to 17,000 premature deaths, 11,000 non-fatal heart attacks, and hundreds of thousands of significant illnesses.¹ The Clean Air Act requires that existing plants² must comply with the Air Toxics Rule as expeditiously as practicable, but in no event later than three years after the effective date of the rule.³

Some of the Nation’s power plants already have installed controls needed to meet the emissions limits as they were proposed⁴, and many owners of the remaining units have publicly stated that they can meet the deadline. For example, Midwest Generation, one of the Nation’s largest merchant coal generators, has said that a three-year window for compliance is reasonable and it is well-positioned to timely comply with the Rule.⁵ Midwest Generation is not alone. Some companies, however, have claimed they need more time to comply.

EPA (or a state with an approved Title V program) has authority on a case-by-case basis to issue a permit that grants an extension of the compliance timeframe for an existing source by up to a year “if necessary

¹ “Regulatory Impact Analysis of the Proposed Air Toxics Rule: Final Report,” at 2 (March 2011) (“RIA”), available at <http://www.epa.gov/ttn/ecas/regdata/RIAs/ToxicsRuleRIA.pdf>

² New sources that commence construction after the effective date of the final rule must achieve compliance immediately. New sources that commence construction between the date of publication of the proposed rule and the date the final rule becomes effective are not required to comply with the new source standards until the date 3 years after the effective date of the rule, if the final standard is more stringent than the proposed standard and the source complies with the proposed standard during the 3-year period. 42 U.S.C. § 7412(i)(2).

³ Sources may receive case by case 1 year extensions “if such additional period is necessary for the installation of controls.” 42 U.S.C. § 7412(i)(3)(A)&(B)

⁴ These pollution control installations were primarily to comply with other EPA or state air emission regulations.

⁵ Comments of Midwest Generation, a subsidiary of Edison Mission Energy, on EPA’s Proposed National Emissions Standards for Hazardous Air Pollutants from Coal- and Oil-Fired Electric Utility Steam Generating Units and Standards of Performance for Fossil-Fuel Fired Electric Utility, Industrial-Commercial-Institutional, and Small Industrial-Commercial-Institutional Steam Generating Units, Docket ID No. EPA-HQ-OAR-2009-0234, August 4, 2011, pp. 2-3.

for the installation of controls.”⁶ Nonetheless, a few commenters,⁷ including the industry group Edison Electric Institute (“EEI”), contend the limited statutory authority for case-by-case existing source extensions should and could be translated into a “blanket” one-year compliance extension for every plant in the Nation.⁸ Such an overreaching compliance delay, coupled with the lack of safeguards against completely uncontrolled emissions during the period of the delay, would unnecessarily prolong the public’s exposure to dangerous pollution. Moreover, it is unnecessary as a policy matter -- the reality is the Nation does not need to choose between clean, healthy air and reliable electricity. It can have both.

Contrary to EEI’s sweeping request for a blanket one year extension to install pollution controls, five electric regional transmission organizations (collectively, “Joint RTO Commenters”) have proposed to EPA a narrowly drawn, unit-specific reliability safeguard (“Reliability Safeguard”).⁹ The Joint RTO Commenters are charged with overseeing the reliability of electric grid service provided to more than 155 million Americans.¹⁰ Under their proposal, only those power plant units truly needed for reliability (“Reliability Critical Units”), and which meet stringent eligibility criteria, could receive an extension “tailored to the specific reliability need”¹¹ if efforts to meet the Air Toxics Rule standards and at the same time mitigate their reliability impacts are expected to take over three years.¹² Significantly, the Joint RTO Commenters emphasized they “anticipate that [the Reliability Safeguard] would not need to be invoked often, if at all.”¹³

⁶ 42 USC § 7412(i)(3)(B).

⁷ See e.g. Comments to Toxics Rule filed by Utility Air Regulatory Group, Southern Company and American Electric Power, Docket ID No. EPA-HQ-OAR-2009-0234.

⁸ EEI does not suggest any limitation on operations that might accompany the blanket extension it proposes.

⁹ Joint Comments Of The Electric Reliability Council of Texas (ERCOT), The Midwest Independent Transmission System Operator (MISO), The New York Independent System Operator (NYISO), PJM Interconnection, L.L.C. (PJM), And The Southwest Power Pool (SPP), Docket Nos. EPA-HQ-OAR-2009-0234; EPA-HQ-OAR-2011-0044; FRC-9286-1, August 4, 2011. (“Joint RTO Comments”), at 1-2. We are not endorsing the Joint RTO proposal, simply describing it as an alternative to the sweeping extension ideas proposed by others, and noting that if it is adopted in some form, it must include Reliability-Only Dispatch provisions to maximize protections to public health and the environment.

¹⁰ ERCOT serves over 23 million people, MISO serves over 40 million people, NYISO serves about 19 million people, PJM serves over 58 million people, and SPP serves over 15 million people.

¹¹ Joint RTO Comments at p. 5. Under the Joint RTO Commenters’ proposal, units that seek extra time to comply would be required to notify their RTO within one year from the effective date of the final rule, or January 2013, whichever is sooner. The RTO would analyze the request through its planning process, and if it determined that the unit was “reliability critical” and the necessary reinforcements or replacement resources would take more than three years to complete, the unit would be granted an extension of time to comply.

¹² Also notable is that the National Association of Regulatory Utility Commissioners (“NARUC”), representing the country’s state public service commissioners who are charged with ensuring regulated utilities provide reliable electric service, sought no blanket compliance extension, but encouraged EPA to coordinate with the Federal Energy Regulatory Commission (“FERC”) to develop a process requiring generators to give FERC and the RTOs adequate advance notice of expected impact of EPA’s air rules to enable them to address any potential reliability issues.

¹³ Joint RTO Comments p. 6. In separately filed comments, PJM echoed this view stating “PJM believes an up-front, well-designed process to handle these extensions...should be extremely rare, and hopefully never used.” PJM recently released a report concluding that its region has more than ample resource adequacy even given expected

The Joint RTO Commenters did not suggest or specify details about whether and for how long designated Reliability Critical Units would be permitted to run during any extension, but simply recommended allowing such units to continue operating only “until...the reliability issue is remedied via the most expeditious and efficient means available.”¹⁴ As the Air Toxics Rule will prevent hundreds of thousands of illnesses and avoid thousands of premature deaths annually when fully implemented, it is critical that any units granted compliance extensions operate only when needed to maintain system reliability. Accordingly, to minimize health risks, we propose limiting the operation of any such units to the brief periods when required to preserve reliability, *i.e.*, when no other resource is available to meet the electricity need. Such a targeted “Reliability-Only Dispatch” approach can serve the goals of both the Federal Power Act’s reliability framework and the Clean Air Act’s express concern for near term reductions of air toxics and maximum protections for public health and the environment. As discussed further below, this approach could be used in a variety of settings to effectuate both reliability and public and environmental health goals, saving lives while ensuring electric system reliability where that is jeopardized.

In this report, we examine the potential value of a Reliability-Only Dispatch option as compared with compliance extensions without additional restrictions on operations. We conclude (based on modeling of a hypothetical limited number of unit-specific extensions) that a properly designed Reliability-Only Dispatch approach could avoid almost 4000 premature deaths and save \$29 billion in monetized health damages over the year extension, as compared with extensions for the same units, but without further controls on operations.

I. Any Air Toxics Rule Implementation Delay Will Cost Lives and Cause Illness

EPA estimates that the Air Toxics Rule would reduce annual mercury emissions by 18 tons (a 74% reduction) and annual SO₂¹⁵ emissions by 2,100,000 tons (a 55% reduction),¹⁶ thereby preventing each year 6,800 to 17,000 premature deaths, 11,000 non-fatal heart attacks, 5,300 hospitalizations, 850,000 lost work days, and hundreds of thousands of other significant illnesses.¹⁷ This Rule is already nearly ten years overdue – EPA listed the industry for regulation in 2000, and was required to finalize section 112 standards for it in 2002 -- extensions of time to comply with the Air Toxics Rule would add insult to

retirements. See Coal Capacity at Risk for Retirement in PJM: Potential Impacts of the Finalized EPA Cross State Air Pollution Rule and Proposed National Emissions Standards for Hazardous Air Pollutants.

¹⁴ Joint RTO Comments at p. 5.

¹⁵ The Air Toxics Rule will reduce emissions of a number of HAPs, most notably mercury, fine particulate matter (as a surrogate for toxic metals other than mercury) and acid gases. In addition, the systems installed to control for non-metal and acid gas HAPs will also reduce emissions of fine particle matter (PM_{2.5}) and sulfur dioxide (“SO₂”). SO₂ contributes in important ways to the formation of PM_{2.5}, which is a cause of premature mortality and other health effects. Consequently, the health benefits of the Air Toxics Rule stem from the reductions in HAPs as well as co-benefits associated with reduced conventional air pollutants such as SO₂.

¹⁶ RIA at p. 226, Table 8-4.

¹⁷ RIA at p. 2.

injury, further delaying reductions of harmful emissions and the significant health benefits of the rules, which Congress intended should be quickly realized and realized to the maximum extent achievable.

The emissions impacts of any extensions depend, of course, on the amount of generation capacity for which extensions are granted, which in turn will depend on the amount of generation capacity being retrofit, the availability of materials and workers, and the nature of needed retrofit controls. Because the time and the material constraints associated with the application of flue gas desulfurization (“FGD”) or dry sorbent injection (“DSI”) systems to treat acid gases are often cited as causing the need for extensions beyond the three year compliance period, we used EPA’s projections for FGD and DSI system installations to estimate the generating capacity that might seek a one year compliance extension under CAA section 112(i)(3)(B).

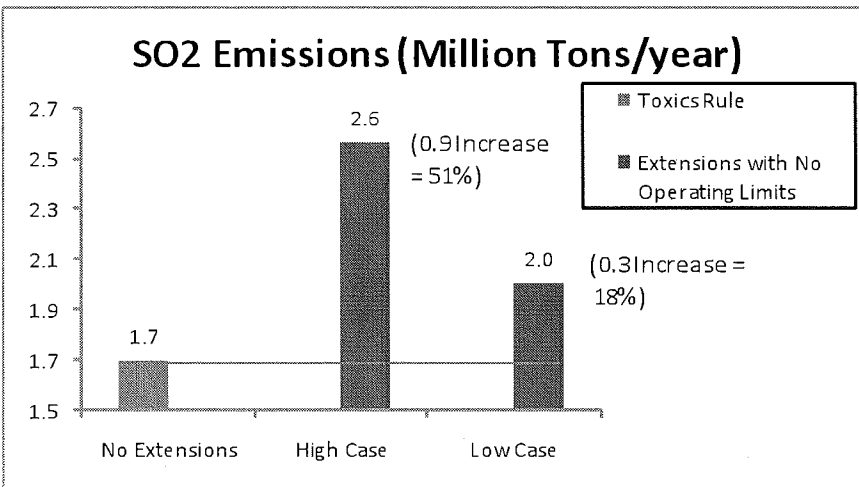
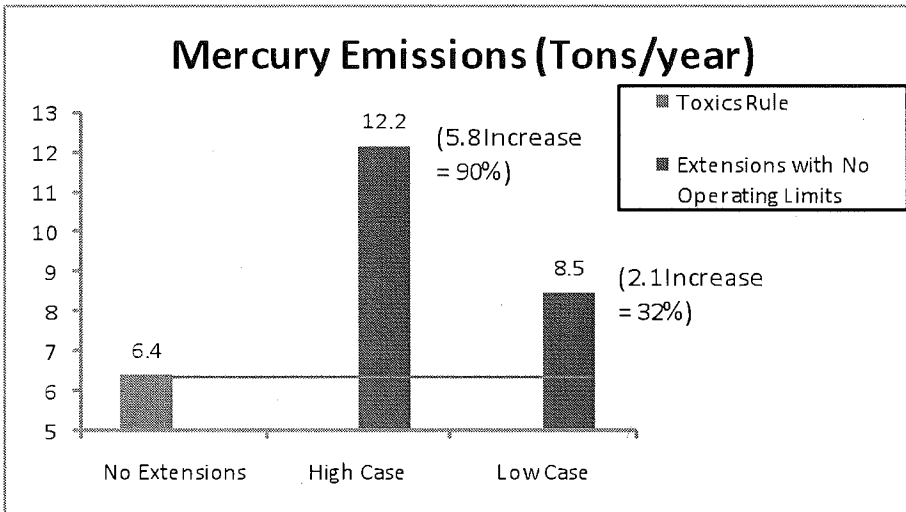
Specifically, we created hypothetical high and low scenarios for the sake of this analysis. For the high scenario, we assumed that extensions would be granted to 75% of the capacity EPA estimates will need to install FGD and 25% of the capacity EPA estimates will need to install DSI. For the low scenario, we assumed that extensions would be granted to 25% of the capacity EPA estimates will need to install FGD and 10% of the capacity EPA estimates will need to install DSI.

Table

1

	2015				
	New FGD & In EPA Case	Capacity Granted			
		Hig		Lo	
		Percen	Capacity	Percen	Capacity
FG	2	75	2	25	7
DS	5	25	1	10	6
Tota	8	41	3	15	1

Then, to calculate the incremental mercury and SO₂ emissions resulting from unrestricted operation of the total GW of capacity modeled as receiving extensions, we adjusted EPA’s estimated emission reductions for mercury and SO₂ based on the amount of retrofit capacity that is assumed to be granted a delay under the two hypothetical scenarios analyzed. In particular, as detailed in Charts 1 and 2 below, assuming that EGUs receiving extensions are allowed to operate in “business as usual” mode whenever it is economic for them to run, mercury emissions would increase annually by 2.1 - 5.8 tons and SO₂ emissions by 0.3 – 0.9 million tons over the projected levels under full implementation of the Air Toxics Rule. These tonnage estimates are equivalent to a 32 – 90 percent increase in mercury emissions and an 18 – 51 percent increase in SO₂ emissions over the fully implemented Air Toxics Rule scenario.



Focusing only on SO₂, as shown in Table 2 below, the incremental emissions are associated with thousands of premature deaths, heart attacks, hospitalizations and illnesses that would be avoided if the Air Toxics Rule were fully implemented, rather than delayed a year.

Table 2

Health Impacts of Additional SO₂ Emissions

Health Effect	300,000 Tons of SO ₂		900,000 Tons of SO ₂	
	Cases	\$ Value	Cases	\$ Value
Mortality (Laden)	1,313	\$9,590,940,962	3,939	\$28,772,234,566
Mortality (Pope)	511	\$3,733,352,902	1,533	\$11,197,407,973
Mortality (Woodruff)	1	\$8,840,107	4	\$26,514,671
Acute Bronchitis	731	\$314,890	2,192	\$944,957
Heart Attacks	797	\$87,047,142	2,391	\$261,206,465
Asthma Exacerbation	8,392	\$436,363	25,170	\$1,308,836
Chronic Bronchitis	311	\$137,767,610	932	\$413,301,173
Asthma ER Visits	472	\$174,289	1,417	\$522,913
Cardio. Hosp. Adm.	256	\$7,105,727	767	\$21,310,765
Resp. Hosp. Adm.	121	\$1,677,721	363	\$5,031,842
LRS	8,671	\$164,742	26,016	\$494,309
MRAD	374,423	\$22,839,805	1,123,137	\$68,511,344
URS	6,538	\$196,129	19,608	\$588,244
WLD	62,852	\$5,646,030	188,521	\$16,935,455

Note: These were calculated using the Abt Powerplant Impact Estimator Model. The increase in emissions was spread across all coal-fired power plants proportionately. The same percentage increase in emissions was applied to each plant.

Source: Clean Air Task Force. See Appendix A for a detailed description of the methodology used.

II. Reliability-Only Dispatch Saves Lives, Protects Health and Ensures Reliability

We can substantially reduce, if not entirely eliminate, harmful emissions and related premature deaths, illnesses, and lost work days resulting from delayed compliance by limiting the operation of EGUs granted extensions only to those periods in which they are truly needed to maintain the reliability of the electric grid.

A. *“Business As Usual” Electric Generation Pricing and Dispatch Rules Favor Uncontrolled Units*

The “electricity grid” comprises interconnected generation resources (including EGUs), electric transmission lines and local distribution companies (“LDCs”), with a transmission system operator (“TSO”) responsible for balancing the supply of electricity with demand. An RTO, Independent System Operator (“ISO”), or an integrated utility may serve as the TSO. As demand fluctuates, often minute to minute, the TSO calls upon or dispatches generation resources to produce power sufficient to meet that demand. To minimize costs for consumers, the TSO dispatches the lowest cost generators first. As demand falls, the TSO notifies the most expensive resources to reduce or cease operations.

Not all generation resources produce electricity at the same operating cost per megawatt hour (MWh). Even among fossil-fuel EGUs, production costs may vary substantially based upon fuel type, fuel cost, transportation costs, unit efficiency and other factors. As the TSO dispatches generation resources to produce electricity, the TSO will maximize the use of lower cost resources before dispatching higher cost resources, thus minimizing the ultimate cost to consumers. EGUs with the lowest operating costs, which are often referred to as “baseload units,” will be dispatched at all times they are available; EGUs with high operating costs, or “peakers,” will be dispatched less frequently or not at all.

In a competitive region served by an RTO, all dispatched generators are paid a single clearing price,¹⁸ as determined by the price of the last resource required to meet demand. EGU owners with lower costs, therefore, enjoy a two-fold advantage over those with higher costs: not only are their EGUs dispatched more often, with the result that their owners sell more electricity to the grid, but they also receive higher profits on the electricity they sell.

This market structure has significant implications in evaluating the consequences of delaying Air Toxics Rule implementation. Most significantly, it is ordinarily less expensive to operate a plant without add-on pollution controls, as such controls often involve expensive sorbents, catalysts or reagents, and consume energy that would otherwise be available for sale. Thus uncontrolled, and therefore dirtier but lower cost units are likely to be dispatched before controlled, and therefore cleaner but higher cost units. In a regulated region, these same dynamics will affect

¹⁸ *Blumenthal v. FERC*, 552 F.3d 875, 878 (D.C. Cir. 2009).

the revenues an integrated utility receives for off-system sales, as the regulated units compete directly with off-system units.

To address these unintended incentives to delay, and to substantially reduce harmful emissions, we propose that any EGU receiving any compliance extension must be permitted to operate only as required to maintain reliability and only when a demonstrated reliability problem exists, *i.e.*, "Reliability-Only Dispatch." This requirement must be implemented, in the case of a one-year extension under CAA section 112(i)(3)(B), through conditions in the Title V permit for the source. In the case where the statutory compliance deadline is violated and there is a negotiated resolution under CAA section 113(a)(4), the Reliability-Only Dispatch requirement must be included in an administrative consent order. In the extremely unlikely event of a "national emergency extension" under CAA section 112(i)(4), such restrictions must be imposed as a condition of any such extension or included in any order or consent agreement reached as a result of a dispute over the extension. And finally, in the equally unlikely event of an emergency proceeding under section 202(c) of the Federal Power Act, FERC or DOE must include these restrictions in any order or negotiated consent decree.¹⁹ In short, regardless of the forum, Reliability-Only Dispatch should be imposed to protect public health during any extension period.

¹⁹ We do not address here the question whether this situation would violate the law – or whether this identified conflict between Clean Air Act requirements and Federal Power Act requirements would always be resolved in favor of the dispatch of uncontrolled units, as resolution of the identified conflict of laws is outside the scope of this report.

B. *Reliability-Only Dispatch Must be an Element of the Joint RTOs' Proposed Reliability Safeguard, if Adopted.*

As described above, during the comment period for the Air Toxics Rule, EPA received a letter from the Joint RTO Commenters, advocating a framework that in the group's view could ensure that retiring units do not jeopardize electric system reliability. The "Reliability Safeguard" proposed by the Joint RTO Commenters would establish a unit-specific approach to address any local reliability impacts caused by retiring units.

Notwithstanding the otherwise applicable RTO retirement advance notice requirements which range from 45 days to 26 weeks,²⁰ the Joint RTO Commenters recommend that EPA grant extensions on a case-by-case basis only to Reliability Critical Units that provide at least two years advance notice of retirement, and for which replacement resources or transmission upgrades would take over three years to finish. Under the RTOs' proposed targeted "safety valve", such units would only be allowed to operate "until the reliability issue is remedied via the most expeditious and efficient means available."²¹ Reinforcing the position that this proposed safeguard would only be used in narrow circumstances, the RTOs asserted they "anticipate that [the Reliability Safeguard] would not need to be invoked often, if at all."²²

In the event that EPA adopts the Joint RTO Commenters' Reliability Safeguard approach, Reliability-Only Dispatch must be applied to ensure reliability while minimizing harmful pollution. As demonstrated further below, the record is clear that even where Reliability Critical Units exist and may seek and be granted a compliance extension, these units do not need to operate in an unlimited, "business as usual" mode in order to protect reliability.

C. *The Electric Industry And RTOs Have Employed Reliability-Only Dispatch in Other Contexts*

Under current rules, EGU owners must provide advance notice to their RTOs of their decision to retire a unit so that the RTO can assess any potential threat to reliability.²³ If the RTO determines that the retirement will undermine reliability, although it cannot mandate continued

²⁰ These rules vary in each region. For example, in ERCOT, generators must provide 90 days notice for units taken out of service for periods that exceed 180 days (ERCOT Protocol Section 3.14.1.1). In MISO, units must provide 26 weeks advance notice (MISO Tariff section 38.2.7 and Attachment Y). In the NYISO, the requirement is 180 days notice for generators larger than 80 MW and 90 days for generators smaller than 80MW (NYSPC Case No. 05-E-0889). In PJM, units must provide 90 days notice (PJM Tariff section 113.1 and 113.2) and in SPP, they must provide 45 days notice (SPP EIS Protocols Section 12).

²¹ Joint RTO comments at p.5. *See id.*

²² Joint RTO comments at p.6. We concur with this view that this safeguard should rarely need to be invoked; the record demonstrates that EPA's Air Toxics Rule can be implemented without much, if any, need to invoke the authorized compliance extensions.

²³ See supra note 20.

operation, the RTO and the EGU owner generally will coordinate to develop a retirement schedule that enables completion of any required generation or transmission upgrades. If an RTO-driven retirement schedule requires the owner of an uncontrolled EGU to operate beyond an applicable compliance deadline imposed under an environmental statute (rather than retiring the unit), a conflict arises between the goals of the Federal Power Act with respect to system reliability and the public health and environmental goals of the environmental statute. Historically, similar conflicts have been resolved through enforceable consent orders of various kinds reached in settlement of the disputes. Under such orders, the EGU owner agrees to operate only as necessary to maintain reliability in the face of demonstrated need for such operation, and only until the agreed upon scheduled retirement date. We propose that any such arrangements for continued operation reached in connection with extensions of the Air Toxics Rule must also contain “Reliability-Only Dispatch” limitations.

There are several examples of such agreements. An example of the kind of order that could be reached in the event of a dispute related to a CAA section 112(i)(3)(B) one-year case-by-case compliance deadline extension is the agreement among Exelon Corporation (“Exelon”), the Pennsylvania Department of Environmental Protection (“PADEP”) and PJM Interconnection (“PJM”), the nation’s largest RTO. That agreement, covering the retirement of four old, coal and oil-fired EGUs at Exelon’s Cromby and Eddystone stations in southeastern Pennsylvania, resolved ongoing conflicts between environmental statutory requirements and concerns about local electric reliability. In 2009, Exelon announced its plan to retire the units as of May 2011 to resolve ongoing permit disputes with PADEP, but PJM found that the shutdown would adversely affect reliability unless a number of transmission upgrades were completed. Accordingly, PJM asked Exelon to make two of the four EGUs available until as late as May 2013, to allow for completion of required transmission upgrades. To minimize environmental and public health risk while ensuring reliability, the parties negotiated a reliability must run (“RMR”) agreement in which PADEP (the state agency acting under federal Clean Water Act authority) agreed to the continued operation beyond May 2011 of two of the EGUs, as requested by PJM, subject to a Reliability-Only Dispatch limitation agreed to by both Exelon and PJM.²⁴ EPA has the same legal authority to impose conditions as the PADEP. The Clean Air Act authorizes operating conditions on extensions that are “necessary to assure compliance”²⁵ and EPA’s regulations require

²⁴ PADEP had issued a revised National Pollutant Discharge Elimination System (“NPDES”) permit for the Cromby facility in June 2006. As this permit contained provisions requiring substantial capital investments in the facility that Exelon could not justify economically, Exelon appealed and the appeal was still pending in 2009. By 2009, because of the pending demand for substantial capital investment to meet NPDES permit requirements along with low demand, falling natural gas prices and other economic factors Exelon decides to retire these four units. For further information about the Cromby/Eddystone arrangement, see Appendix B.

²⁵ See CAA sections 112(i)(3)(B) and 504(a). These conditions would be included in the relevant unit/source’s Title V Permit.

conditions that are “necessary to assure... protection of the health of persons during the extension period.”²⁶

While the Cromby-Eddystone arrangement is the kind of multi-party agreement that could be developed to resolve conflicts over CAA section 112(i)(3)(B) one-year case-by-case extensions of Air Toxics Rule compliance, the Department of Energy/FERC orders directing operation of the Mirant Potomac River station provide a somewhat analogous situation to a CAA section 112(i)(4) “national emergency” extension, showing that such an extension can incorporate a Reliability-Only Dispatch limitation. In 2005, Mirant, the owner of the Potomac River Plant located in Virginia, and serving Washington, DC, decided to shut down all five units at that plant in response to findings in an environmental report prepared by the Commonwealth of Virginia about expected local violations of the National Ambient Air Quality Standards.²⁷ As a result of that report, Mirant had the choice between immediate application of controls or reducing or eliminating service at the station. The DC Public Service Commission petitioned DOE and FERC to issue an emergency order pursuant to section 202(c) of the Federal Power Act,²⁸ which provides for “temporary connection and exchange of facilities during emergency.” The DC Public Service Commission argued that Mirant should be required to continue operating the units because their shutdown could pose a federal emergency due to the sensitivity of the federal government operations which would have been affected had blackouts occurred.²⁹ The City of Alexandria, Virginia opposed the continued uncontrolled operation of the plant on behalf of its citizens living in the plant’s shadow.³⁰ DOE issued an emergency order mandating that Mirant continue operating the plant under limited circumstances designed to avoid a DC area blackout while also limiting dangerous emissions and preventing, to the full extent possible,

²⁶ 40 CFR 63.6(i)(10)(v)(A).

²⁷ The current owner of that station, GenOn, has recently announced its intention to permanently close the station, and PJM has confirmed with GenOn that the Potomac River plant “may be deactivated at any time” because there are no reliability concerns. Letter from Michael Kormos, PJM, to Carrie Allen Hill, GenOn at 1 (September 29, 2011).

²⁸ 16 U.S.C. §824a(c) (“During the continuance of any war in which the United States is engaged, or whenever the Commission determines that an emergency exists by reason of a sudden increase in the demand for electric energy, or a shortage of electric energy or of facilities for the generation or transmission of electric energy or of fuel or water for generating facilities, or other causes, the [Federal Energy Regulatory] Commission shall have authority, either upon its own motion or upon complaint, with or without notice, hearing, or report, to require by order such temporary connections of facilities and such generation, delivery, interchange, or transmission of electric energy as in its judgment will best meet the emergency and serve the public interest. If the parties affected by such order fail to agree upon the terms of any arrangement between them in carrying out such order, the Commission, after hearing held either before or after such order takes effect, may prescribe by supplemental order such terms as it finds to be just and reasonable, including the compensation or reimbursement which should be paid to or by any such party.”).

²⁹ United States of America Before the Department of Energy and Federal Energy Regulatory Commission, Docket No. EL05-145-000, Emergency Petition and Complaint of the District of Columbia Public Service Commission, August 24, 2005, p. 1.

³⁰ City of Alexandria, Virginia Comments Regarding Department of Energy Emergency Order, Operating Plan by Mirant and Proposed Special Environmental Analysis. Docket No. EO-05-01 (Feb. 21, 2006).

exceedances of federal air quality standards.³¹ Specifically, the Secretary's order permitted the plant to produce only "that amount of electricity specified by PJM to meet demand," and sought to minimize environmental harm by requiring that the station "utilize pollution control equipment and measures to the maximum extent possible to minimize the magnitude and duration of any exceedance of the National Ambient Air Quality Standards."³²

While it is highly unlikely that a similar emergency situation will arise under the Air Toxics Rule, as noted above CAA section 112(d)(4) does permit Presidential extensions of the compliance deadline, when required by the "national security interests of the United States" and when pollution controls to meet the rule are "not available."³³ In such an event, Reliability-Only Dispatch provisions must be included as a condition of any such extension or included in any order or consent agreement reached as a result of a dispute over the extension.

The Cromby-Eddystone RMR agreement and Potomac River order demonstrate that maintaining electric reliability does not require unrestricted "business as usual" operations. Allowing unrestricted EGU operations past the Air Toxics Rule compliance date would needlessly endanger human and environmental health. The Reliability-Only Dispatch model contained in the Cromby-Eddystone RMR agreement and the Potomac River order, however, provides a path forward to reconcile the inherent conflict between environmental performance under the Clean Air Act's air toxics requirements and any demonstrated system reliability concerns associated with meeting those requirements.

III. Reliability-Only Dispatch Can Protect Reliability and Maximize Air Toxics Rule Benefits In the Event of Any Compliance Extension

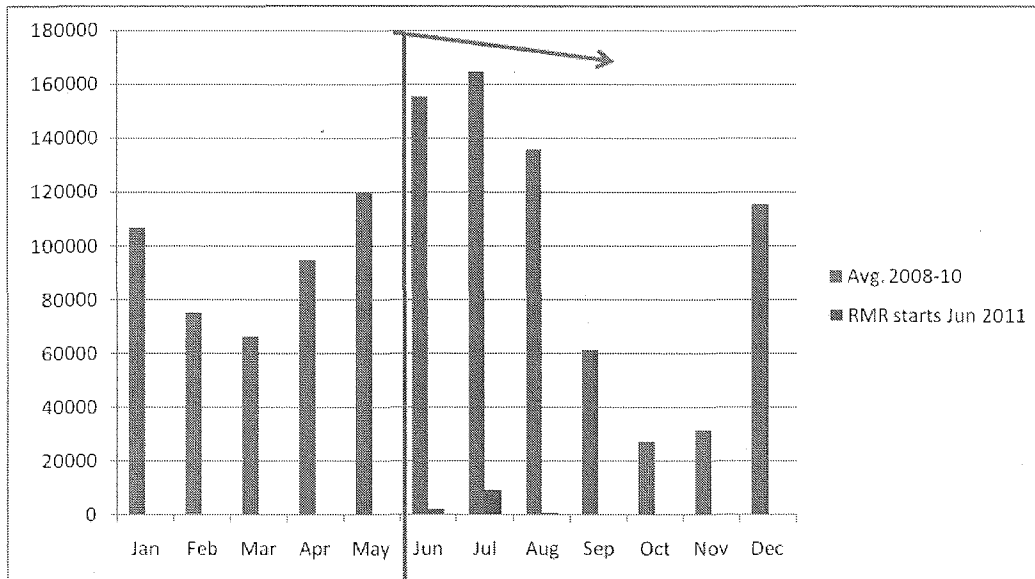
Reliability-Only Dispatch could preserve many of the Air Toxics Rule emissions reduction benefits associated with control of an affected unit or source, in the unlikely event that the source is granted an extension of the compliance deadline for the Air Toxics Rule. The operating history of the Cromby-Eddystone units underscores the comparative emission reduction benefits of Reliability-Only Dispatch limitations. Comparing the monthly average combined electricity production in Mwh during the 2008-2010 period to the combined production of the two units in June, July and August 2011 - the first three months in which Reliability-Only Dispatch was in effect - demonstrates the dramatic drop in the two units' production, and therefore in harmful pollution emissions. Importantly as well, these units remained available to maintain reliability, on some of the hottest days when demand peaked.

³¹ *District of Columbia Public Service Comm'n*, USDOE Docket No. EO-05-01, Order No. 202-05-03 (December 20, 2005).

³² *Id.* at 10.

³³ 42 U.S.C. § 7412(i)(4).

Table – Cromby/Eddystone 2008-10 Average Output/RMR Output



To extrapolate the beneficial impact of the Cromby-Eddystone Reliability-Only Dispatch terms on air emission reductions, for this analysis, we assumed that any other EGU subject to similar limitations would reduce generating output by 85 percent³⁴ and that this reduced output would be replaced by a mix of Air Toxics Rule compliant coal-fired EGUs and natural gas generation, which would have much lower emission rates than non-compliant coal-fired EGUs.

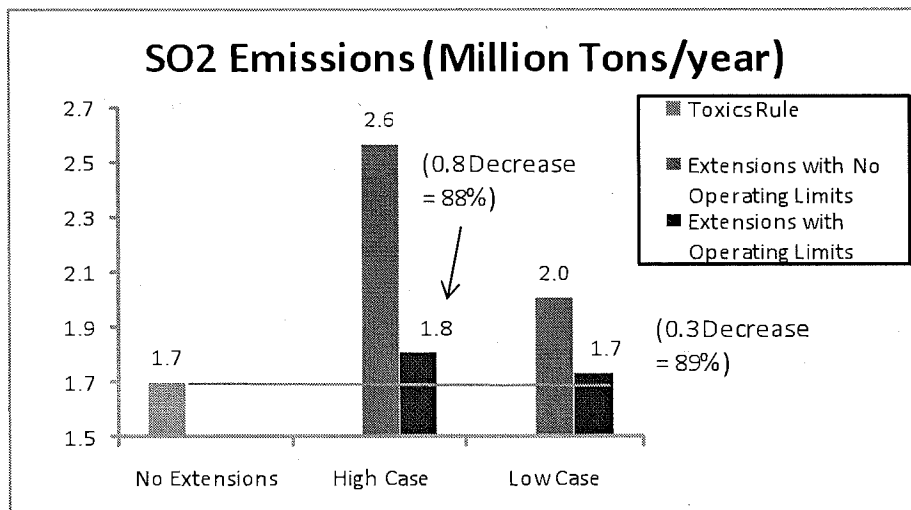
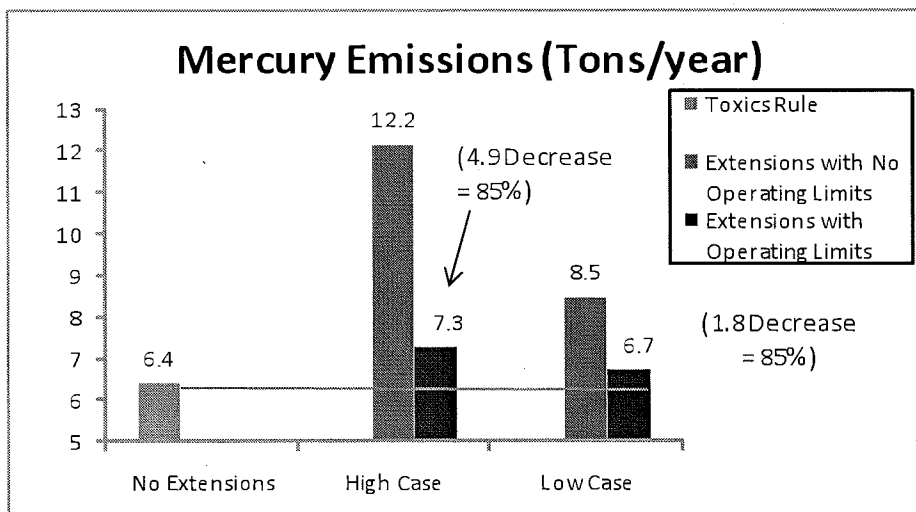
As noted in Section I of this report, if no such dispatch limitation were imposed, any one-year extensions could significantly increase mercury and SO₂ emissions (as well as other air toxics which would not be controlled at the noncompliant existing unit or source). For our modeled number of extensions, mercury increased by up to 5.8 tons per year and SO₂ by up to 0.9 million tons per year, as compared to required Air Toxics Rule emission levels.

By contrast, under the extension scenarios described earlier, with Reliability-Only Dispatch the modeled number of one-year extensions would be expected to increase mercury emissions by only 0.3 to 0.9 tons, and SO₂ emissions by 0.1 million tons.³⁵ Reliability-Only Dispatch therefore would have benefits, at a minimum, in reducing mercury and SO₂ emissions by 85 to 89 percent below levels that would otherwise result from the grant of an extension at that unit, thus

³⁴ Cromby and Eddystone have reduced output by much more than 85% during June, July and August 2011 relative to recent years, but due to the limited number of data points and uncertain peak load in the future, an 85% reduction was used as a conservative assumption.

³⁵ We did not attempt to predict the other benefits associated with lower emissions of PM, metal HAPs and dioxins/furans associated with more limited operation of the affected units than would have been the case in the event of an extension with no Reliability-Only Dispatch conditions.

promoting the public health and environmental goals embodied in the Clean Air Act requirement to maximize reductions of air toxics to the extent achievable.



IV. Reliability-Only Dispatch Must be in Place for Any Extension of the Toxic Rule Compliance Deadlines

As we have noted, a unit granted a case-by-case one-year extension under the CAA, where necessary for the installation of pollution controls, will be issued a modified Title V operating permit, which otherwise by the deadline would have to contain emissions limits consistent with Air Toxics Rule compliance.³⁶ The Title V provisions of the Act instruct that the permit can include “such other conditions as are necessary to assure compliance with applicable

³⁶ 42 U.S.C. §§ 7412(i)(3)(B); 7661c(a).

requirements of [the Clean Air Act].” We assert that such conditions can and must include Reliability-Only Dispatch limitations on operations.³⁷

In addition to the case-by-case one-year extensions for the installation of controls, the Clean Air Act authorizes EPA to negotiate with a source that is out of compliance and enter into an administrative order on consent that would give the source an additional year to bring the unit into compliance.³⁸ Beyond these provisions, the Clean Air Act permits an extension of more than one year beyond the three year statutory compliance period only when the President determines that controls are not available and that there is a national security issue requiring the extension.³⁹ Likewise, Federal Power Act section 202(c) authorizes FERC, in the event a reliability emergency exists “to require by order such temporary connections of facilities and such generation, delivery, interchange, or transmission of electric energy as in its judgment will best meet the emergency and serve the public interest.”⁴⁰ Though these provisions are, and should be, rarely if ever, invoked, each provides the opportunity to impose the Reliability-Only Dispatch limitation we advocate. Each can be conformed in the very limited instances in which a reliability need is presented to direct units to run only to the extent absolutely necessary to maintain system reliability and at the same time maximize its utilization of any existing emissions controls “in the public interest.”

While we do not endorse the Joint RTOs’ Reliability Safeguard approach, it would, if adopted, offer a mechanism for determining in advance whether a documented reliability need is present, and planning for it so as to avoid a plethora of last-minute disputes. The advance notice of a problem would enable a timely negotiation of specific Reliability-Only Dispatch and other operating limitations and conditions to assure compliance with the Air Toxics Rule as expeditiously as practicable.⁴¹ A similar process should be used by North American Electric Reliability Corporation (“NERC”) regional entities or Public Service Commissions to assess whether there are Reliability Critical Units in regions without an RTO.

V. Conclusion

³⁷ The general requirements for any granted extensions must be in writing, and must contain all conditions deemed necessary by the permitting agency for the protection of human health. *40 C.F.R. § 63.6(i)(10)*.

³⁸ 42 U.S.C. §7413(a)(4).

³⁹ 42 U.S.C. §7412(i)(4).

⁴⁰ 16 U.S.C. § 824a(c).

⁴¹ In the Cromby-Eddystone RMR agreement, for example, Exelon was permitted to operate the affected EGUs only for “Reliability Purposes,” defined as the commitment of the EGUs only “after all [generation] resources have already been committed and additional units are required to help alleviate a ‘Transmission Security Emergency....’” The term “Transmission Security Emergency” is defined in PJM’s operations manual. Different nomenclature and planning mechanisms may be used in different regions.

The Air Toxics Rule will save lives and significantly improve public and environmental health by substantially reducing HAP emissions from EGUs. Any compliance delay will defer these tremendous health and economic benefits. An unlawful one-year blanket compliance delay, as some have suggested, would result in up to 17,000 premature deaths, 11,000 heart attacks and thousands of other avoidable illnesses. Clearly, there are staggering public health impacts associated with any Air Toxics Rule compliance delay, as well as significant environmental health implications. Therefore, whenever there is a compliance delay, operations must be limited to minimize continued emissions of toxic air pollution.

Reliability-Only Dispatch for units granted extensions to install controls or for non-compliant "Reliability Critical" units which continue operating, however, will save lives and maximize the Air Toxics Rule's vital public and environmental health benefits. Units operating under Reliability-Only Dispatch, as opposed to "business as usual," will only run when no other resource is available to meet electricity needs, if at all, and they will emit only a small fraction of harmful emissions, thus preserving critical Air Toxics Rule public and environmental health protections. As such, EPA should include a statement in the final Air Toxics Rule indicating its intention to impose Reliability-Only Dispatch conditions on any extensions granted by the Administrator. Moreover, regardless of the forum, Reliability-Only Dispatch should be imposed to protect public health during any extension period.

APPENDIX A

Clean Air Task Force Methodology for Estimating Health and Economic Impacts in Table 2

Health damages associated with possible compliance extensions under the proposed Air Toxics Rule were calculated by Clean Air Task Force using Abt Associates' Powerplant Impact Estimator, or PIE model, which was developed to assess the human health and associated economic benefits of air pollution reductions. The PIE model is based on the peer-reviewed health and benefits analysis literature, and on a damage function approach used to estimate health damages. The damage function approach models changes in ambient air pollution levels taking into account meteorology, calculates the associated change in adverse health effects, and then assigns an economic value to these impacts. The PIE model reports premature mortality based on the dose-response relationships reported both by the Pope et al. (2002)⁴² American Cancer Society study and the Laden et al. (2006)⁴³ Harvard Six-Cities follow-up study, the same studies EPA used to analyze the mortality benefits of the 2011 Cross-State Air Pollution Rule.⁴⁴ The three-step analytical process used in the PIE model is EPA's standard approach to evaluate the health and economic benefits of reduced air pollution. For additional details on the PIE method, see: <http://www.catf.us/resources/publications/view/137>. As it was unclear for this analysis which plants would be eligible for any compliance extension and, therefore, the location of the related emissions changes with respect to populations, SO₂ emissions resulting from the estimated extensions were distributed equally on a percentage basis across all of the coal-fired power plants in the United States.

⁴² Pope. C.A., Burnett, R.T., Thun, M.J, Calle, E.E., Krewski, D., Ito, Kaz, Thurston, G.D., *Lung Cancer, Cardiopulmonary Mortality, and Long Term Exposure to Fine Particulate Air Pollution*, Journal of the American Medical Association, Vol. 287, (2002), pp. 1132-1141.

⁴³ Laden F, Schwartz J, Speizer FE, Dockery DW. (2006) Reduction in fine particulate air pollution and mortality extended follow-up of the Harvard Six Cities Study. *Am. J. Respir. Crit. Care Med.* 173:667-672.

⁴⁴ See: <http://www.epa.gov/airtransport/pdfs/FinalRIA.pdf>

APPENDIX B

Background on the Cromby-Eddystone Case

The Retirement Decision

In 2009, Exelon decided to retire four EGUs with a combined capacity of 933 megawatts at two stations in southeastern Pennsylvania. Exelon concluded that these four units were simply uneconomic given their age and efficiency, wholesale electricity market prices, and possible new investment required to meet environmental requirements with respect to the plants' wastewater discharges. The four units were:

- Cromby Unit 1: a 144-megawatt ("MW") coal-fired unit built in 1954;
- Cromby Unit 2: a 201-MW peaking unit that can operate on oil or gas, built in 1955; and
- Eddystone Unit 1 and Unit 2: combined capacity of 588-MW coal-fired plants built in 1960.

The Cromby units are located on the Schuylkill River and the Eddystone units on the Delaware River and Crum Creek. The units both withdrew water from and discharged water to these rivers pursuant to National Pollutant Discharge Elimination System ("NPDES") permits issued by PADEP. PADEP had issued a revised NPDES permit for the Cromby facility in June 2006. That permit contained provisions requiring substantial capital investments in the facility that the Company believed it could not justify economically. Exelon appealed certain terms of the permit to the Pennsylvania Environmental Hearing Board in July 2006, where the appeal was still pending in 2009. As NPDES permits must be renewed every five years, it was inevitable that PADEP would soon issue a new NPDES permit for the Eddystone units as well. By 2009, the pending demand for capital investment to meet NPDES permit requirements at these plants merged with low demand, falling natural gas prices and other factors that caused Exelon to conclude that these four units could not justify the ongoing capital and operating costs that Exelon would have to incur to keep them in operation.

PJM's Reliability Finding

Generation owners within PJM Interconnection LLC ("PJM") must provide notice to PJM of the proposed deactivation of any unit located within PJM. PJM is a regional transmission organization that oversees transmission grid operations and operates the competitive wholesale electricity market in the PJM region that encompasses all or part of 13 states and provides electric service to 51 million people. PJM is regulated by the Federal Energy Regulatory

Commission and has a legal duty to maintain reliable operations and a workably competitive wholesale electricity market.

Exelon notified PJM on December 2, 2009 of its intention to deactivate the Cromby and Eddystone units as of May 2011. PJM advised Exelon on January 5, 2010 that deactivation of Cromby and Eddystone "would adversely affect the reliability of the PJM Transmission absent upgrades to the Transmission System."

On March 2nd, PJM announced the schedule on which the units would be allowed to retire based on the anticipated completion of the transmission upgrades. This schedule was subsequently revised to allow the units to retire on the following schedule:

- Cromby Unit 1 and Eddystone Unit 1 by May 31, 2011;
- Cromby Unit 2 by December 31, 2011; and
- Eddystone Unit 2 by May 31, 2012.

The RMR Agreement

Exelon and PJM ultimately agreed that Cromby Unit 2 and Eddystone Unit 2 would run for reliability purposes from June 1, 2011 until their respective retirement dates, provided that Exelon received the required cost-based compensation approved by FERC and environmental regulatory approvals.⁴⁵ Given that one factor in Exelon's retirement decision was that retirement would allow Exelon to avoid costly upgrades associated with NPDES permits, the Company needed the "environmental regulatory approvals" to permit continued operation of these two units without requiring substantial capital investment.

Ultimately, Exelon was able to reach an agreement with PADEP which was memorialized in an enforceable consent decree entered in 2010. The consent decree resolved Exelon's ongoing environmental compliance issues by requiring Exelon to retire Cromby Unit 1 and Eddystone Unit 1 as scheduled on or before May 31, 2011, while authorizing Exelon to operate Cromby Unit 2 and Eddystone Unit 2 for reliability purposes only until their respective retirement dates. Exelon and PJM agreed to explicit operating procedures that would prevent the dispatch of these units except for "Reliability Purposes," defined as the commitment of the EGUs only "after all [generation] resources have already been committed and additional units are required to help alleviate a 'Transmission Security Emergency....'"⁴⁶ Exelon continues to operate these units

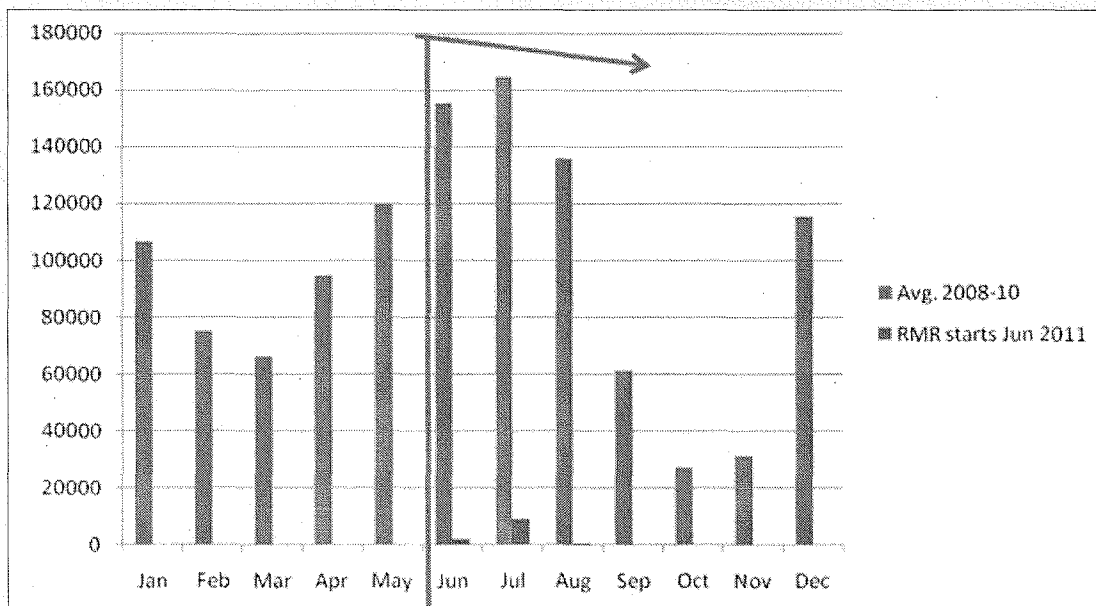
⁴⁵Under the FERC-approved PJM Tariff provisions, if a unit cannot be permitted to retire because of reliability concerns, the generator must be compensated for keeping the unit in service. Section 113.2 of the PJM Tariff provides that, upon receiving PJM's notice that the generation owner must continue operating its generating unit for reliability, the generation owner has two options to ensure its compensation for keeping the unit in service. It either may file with FERC a cost of service rate seeking to recover the entire cost of operating the generating unit beyond its deactivation date, or it may elect to receive the Deactivation Avoidable Cost Credit provided in Section 114 of the PJM Tariff.

⁴⁶Operating Procedures for Cromby Generating Station Unit No. 2 and Eddystone Generating Station Unit No. 2 as Required for Reliability Purposes, May 27, 2010, p. OP-2, §j.

pursuant to this agreement today. Ultimately, as a result of this agreement, the four old, uneconomic units will be retired in a manner that protects reliability and achieves substantial improvements to air and water quality.

Air Quality Impact

The air quality impact of the reliability-only dispatch limitation in the RMR agreement is demonstrated in the following tables. The first table compares the monthly average combined electricity production (in MW/hr) of Cromby Unit 2 and Eddystone Unit 2 during the 2008-2010 period to the combined production of the two units in June, July and August 2011, the first three months in which the reliability-only dispatch limitation has been in effect. This demonstrates a dramatic drop in production, and therefore in HAP emissions from these two units, yet these units have remained available and have in fact been needed to maintain reliability during these summer months in which temperatures have caused high electricity demand.



Of course, the power that had been produced in previous years by these two units was replaced by power from other generation sources. Due to the nature of the grid, it is impossible to identify with certainty the resources dispatched in lieu of the retired units. Based on available market information, there has been no additional dispatch of peaking units in the vicinity of Eddystone station. In the vicinity of Cromby station, there has been some additional dispatch of peaker units at Moser station, as compared to the monthly average dispatch of Moser's units during the 2008-2010 period. It is impossible to determine from this data whether the additional dispatch at Moser is due to the retirement of Cromby Unit 1, the retirement of other

units, the average high temperatures in July 2011 or any number of other potential factors. Even assuming this additional dispatch of the Moser units is due to the retirement of Cromby Unit 1 and the reliability-only dispatch limitation on Cromby Unit 2, the Moser units are newer gas-fired units which produce electricity with lower emissions per MW/hr than the Cromby units.

Lessons from the Cromby-Eddystone RMR Agreement

The Cromby-Eddystone RMR agreement represents a workable model demonstrating how EGU owners, RTOs and regulatory agencies can and do find practical solutions to reconcile competing environmental and reliability needs. The Cromby-Eddystone example demonstrates how through a process of review, any reliability issues related to retiring electricity generation plants can be identified. The Cromby-Eddystone example further shows how environmental improvements can be maximized through such customized solutions to identified reliability issues and tailored to specific, local circumstances. The Cromby-Eddystone example demonstrates that when a plant must continue to operate for some period due to reliability needs, it can be limited to running only to meet those reliability needs.

Brandon Shores Scrubber Project

Constellation Energy Invests in Maryland's People and Environment

In March 2010, Constellation Energy completed a major upgrade to the Brandon Shores power plant by adding Flue Gas Desulfurization (FGD) devices, commonly known as "scrubbers," and finishing fabric filters, commonly known as "baghouses." Scrubbers remove acid gases as well as sulfur dioxide (SO₂), a main cause of acid rain. Bagooses remove particulates and, coupled with carbon injection, remove mercury.

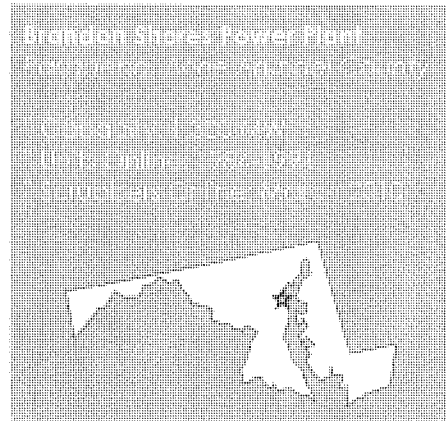
Brandon Shores is now one of the cleanest coal-burning power plants in the country.

- Brandon Shores already had low-NOx burners and electrostatic precipitators (ESP), as well as a selective catalytic reduction system, currently the most advanced technology to reduce emissions of nitrogen oxides (NOx), a component of smog. Together, these controls reduce NOx emissions by approximately 90%.
- Additionally, this project reduced SO₂ emissions by 95%.
- Mercury emissions are expected to be reduced by 90%.

The Brandon Shores upgrade is a landmark in the industry's effort to reduce emissions. You deserve a well-developed and reliable power source to support your state's economic growth. Constellation Energy is proud to invest in the people and environment of the state of Maryland. The Department of the Environment and the National Energy Development Administration are proud to support this project.

The three-year project had substantial economic benefits for the region.

- Constellation's total investment was \$885 million.
- The project required 4.3 million man-hours of work from the Baltimore Building and Construction Trades Council.
 - This included 1,400 skilled construction workers during 26 months of active construction.



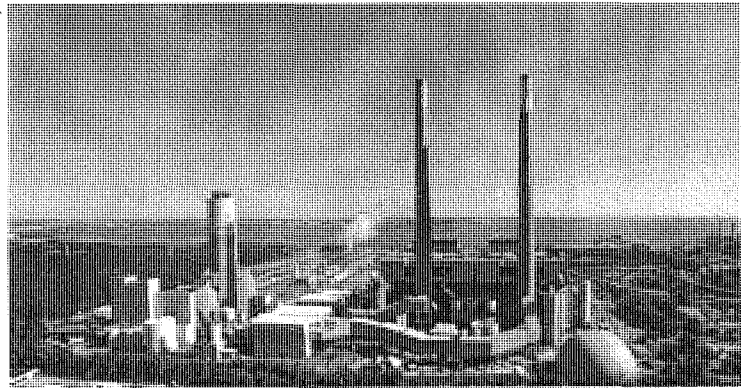
Additional Environmental and Economic Benefits

Wet scrubbers require large amounts of water – approximately five million gallons per day. To meet that demand, Constellation Energy is working with the neighboring Cox Creek Water Reclamation Facility to use treated effluent water that is currently discharged into the Chesapeake Bay. This will allow Constellation Energy to reuse water rather than drawing from sensitive ecosystems.

Constellation Energy

The nation's first gas light utility, Constellation has evolved into one of the largest and most innovative energy companies in America. Constellation Energy is a publicly traded Fortune 500 leader, headquartered in Baltimore, with nearly 10,000 employees, approximately 12,000 megawatts of generation capacity and \$15.6 billion in annual revenues (2009).

Constellation includes the Baltimore Gas and Electric Company (BGE), Maryland's oldest and largest utility.



With recent upgrades in place, the Brandon Shores plant is among the cleanest coal-fired facilities in the country.