Utility MACT Rule
Key Points

Southern Company Meeting with OMB
December 2, 2011

Southern Company is concerned about many aspects of the Utility MACT rule, but today our comments will focus on 3 main points: compliance timing, the mercury standard, and startup, shutdown, and malfunction (SSM).

Point #1: More Time is Needed for Compliance

- EPA and the President should use the existing compliance extensions available under Section 112 of the Clean Air Act (CAA) to grant at least six years to comply. Environmental retrofit controls will take up to six years to complete. New generation will take at least five years. Transmission upgrades will take as much as seven years. Natural gas pipeline expansions will take more than three years. Outage scheduling on a regional and inter-regional basis will be the most challenging that the industry has ever experienced. **Three or four years is absolutely inadequate – at least six years are needed to comply with the myriad of retrofit controls, new generation, fuel switching, and transmission fixes.**

- The compliance extension process should be clarified. EPA should also grant extensions at the outset of compliance to ensure the most cost-effective and efficient compliance schedules.

Point #2: The Proposed Mercury Standard Needs Revision

- EPA's revised existing and new source limits still have problems. The main problem for the existing source limit centers on EPA's use of a MACT pool of 40 units. EPA also failed to properly account for emissions variability. A proper MACT analysis, using the average of the "best-performing 12 percent of existing sources" (*i.e.*, approximately 130 units) and accounting for emissions variability, produces an existing source mercury MACT limit of at least 1.42 lb/TBtu. The difference between a mercury MACT emission limit of 1.2 and 1.4 lb/TBTU will not measurably change atmospheric deposition of mercury or concentrations of mercury in U.S. fish.

- As proposed, the mercury standard must be met on a continuous 30-day rolling average including all operating conditions. Southern's continuous emissions monitoring data for mercury shows that mercury emissions are variable and that longer averaging times (e.g., 365-day rolling averages) could help well-controlled plants achieve the standards.

Point #3: EPA Should Allow Work Practices During Startup, Shutdown, and Malfunction

- EPA should establish work practice standards during startup, shutdown, and malfunction since it is not feasible to establish emission limits during these modes of operation.

- EPA should allows state permitting authorities to develop a work practice plan that outlines operational procedures and relevant Title V permit conditions for startups, shutdowns and malfunctions.

Background
Compliance Timing

- Southern has installed more retrofits on its coal-fired generation than any other utility and understands the amount of time required to design, permit and seek regulatory approval, procure the necessary equipment and materials, and construct the retrofits. Southern has installed 17 scrubbers, 16 SCRs, and 4 baghouse retrofits—a total investment of over $8 billion. Approximately 55 percent of Southern's coal-fired generating capacity now has scrubber and SCR retrofits installed.

- Southern's historical experience, which is the most extensive in the industry, shows it takes an average of 54 months to install a single scrubber retrofit and an average of 36 months to install a single SCR retrofit. Southern installed 4 baghouses concurrently at the same site over a 5 year period. Southern has found that executing several projects simultaneously can complicate logistics, stress the supply chain for major equipment, and compete for limited craft labor resources – all of which can significantly extend project duration. With the utility industry expected to begin a large number of not only retrofit but also new generation and transmission projects as result of the recently proposed and/or finalized EPA rules, these project durations are expected to get even longer than they have been for past projects. (See Figure 1 below for timeline.)

- Southern is evaluating between 15 and 20 possible baghouse projects at the existing coal-fired plants that are, for the most part, already equipped with SCR and FGD. Preliminary planning and design for these baghouse retrofits shows that it is very unlikely any single project can be done in 3 or 4 years given the expected competition for labor and materials. It is expected that completing all the projects simultaneously will take at least 6 years.

- There are many challenges associated with retrofitting pollution control equipment. These challenges will impact the compliance schedule. Examples include: amount of available real estate; proximity of real estate to the boiler; and the type and number of relocations of existing plant structures/operations. A baghouse at Plant Scherer had to be constructed nearly a quarter of a mile from the electrostatic precipitator because there simply was not enough space to install the equipment any closer - this added significant time. Anticipated challenges with future baghouse retrofits include site congestion / space issues and relocations. At one plant, for example, an administration building and an ash handling system must be relocated to install baghouses. These relocations take time and require advance planning and permitting which impacts the overall baghouse installation timelines.

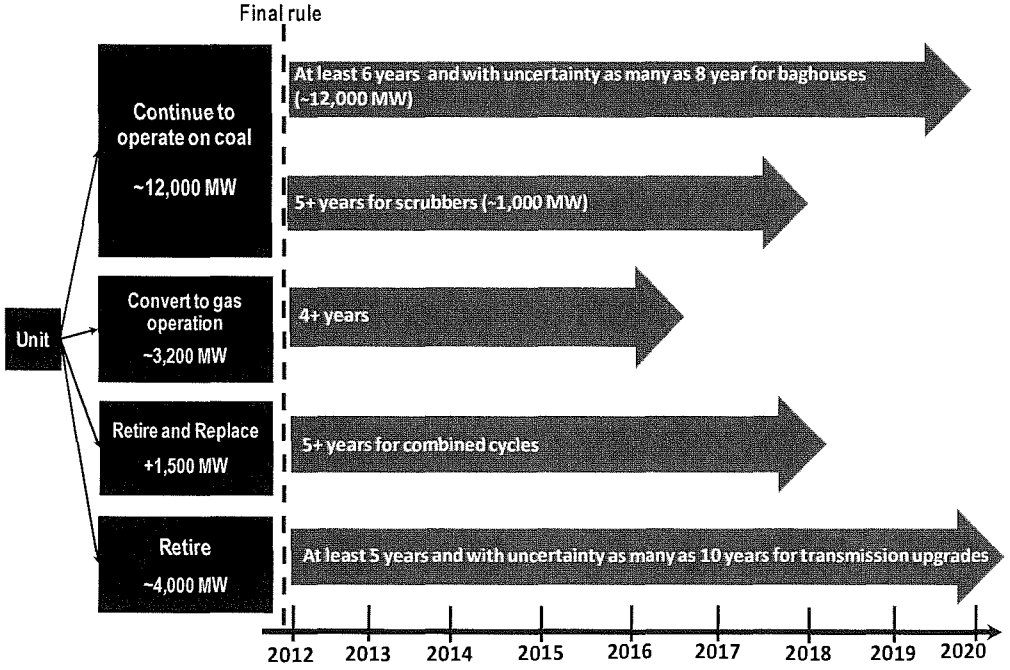
Background
Compliance Timing

Compliance Timing Solution

- First, EPA should use its discretion to grant a blanket one-year compliance extension under CAA § 112 (i)(3)(B). Filing for case-by-case extensions for each unit will be burdensome on both the affected utilities and state permitting authorities. Any approach requiring a detailed study and analysis will take too long, take up too many resources and delay ultimate compliance.

- Second, the President should issue an Executive Order, using the authority under CAA § 112 (i)(4), establishing a process by which additional two-year extensions can be granted. An extension of time should be granted under this delegated authority when 1) the utility is continuing to take diligent, good-faith measures to achieve compliance; 2) the needed technology is —not available; and 3) the appropriate RTO, NERC or the appropriate state commission certifies that an extension of time is necessary to address reliability issues or is consistent with the state-approved integrated resource plan (or similar state process), which may take into account the potential reliability and economic impacts of compliance decisions.

Figure 1. Timeline of Compliance Activities



Background
Mercury Variability

- EPA's revised existing source limit of 1.2 lb/TBtu needs revision. The main problem centers on EPA's use of a MACT pool of 40 units. The existing source mercury limit is also unduly stringent because EPA used minimum (instead of mean) values to calculate the average performance of the top 12%, employed a statistical method that does not account for all emissions variability of the best performing units, and failed to correct errors in its use of the ICR data. A proper MACT analysis produces an existing source mercury MACT limit of at least 1.42 lb/TBtu. (See UARG Comment Attachment 3 and Attachment 4).

- As proposed, compliance must be maintained continuously and will not be measured by snapshots in time. Yet some observers have suggested that many plants—including those owned or operated by Southern Company—already meet the proposed MACT emission limits and will not need to add new emission controls. This point is often made to convince others that compliance extensions are unnecessary and that reliability concerns are false.

- Figure 2 below represents mercury emissions from five Southern Company units with selective catalytic reduction and flue gas desulfurization for mercury control. Of the five units studied, none continuously achieved the revised mercury limit of 1.2 lb/TBtu. Each plant would have exceeded a large percentage of the 30-day averages, with one plant exceeding up to 44 percent of the time. Any exceedance would be unacceptable for MACT compliance that must be achieved all of the time.

Figure 2. Example of Southern Company's Mercury Emissions Variability

	Unit A	Unit B	Unit C	Unit D	Unit E
Average Hg Emissions During Test Period* (lb/TBtu)	0.97	0.94	0.72	0.74	0.93
Max 30-Day Average	**1.62**	**1.49**	**1.41**	**1.44**	**1.75**
Min 30-Day Average	0.26	0.57	0.16	0.16	0.39
No. of 30-Day Averages Exceeding the 1.2 lb/Tbtu Proposed Hg Limit	104	44	31	39	52
No. of 30 Day Averages In Test Period*	236	255	214	251	139
Percent of 30-Day Averages Above 1.2 lb/TBtu	44%	**17%**	**14%**	**16%**	**37%**

*Test Period is from January 1, 2011 to October 11, 2011 and only includes operating days

Figure 3 below represents 30-day rolling average mercury emissions from a unit equipped with selective catalytic reduction and flue gas desulfurization for mercury control. The figure illustrates that while some of the 30-day averages are below the standard, many are above the standard.

Figure 3. Example of 30-day Rolling Average Mercury Emissions at Plant F, excluding Startup, Shutdown, and Malfunction

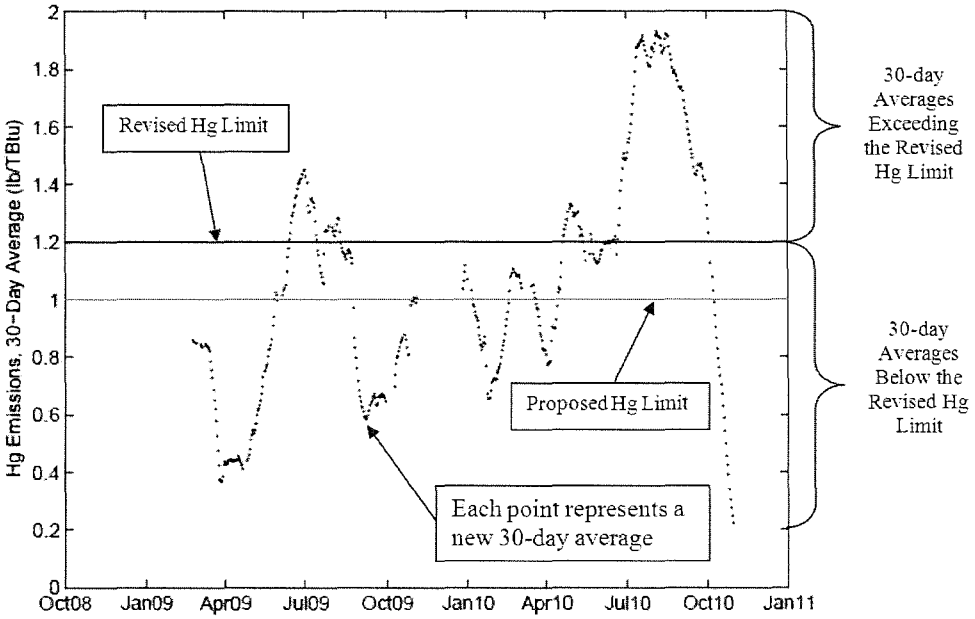
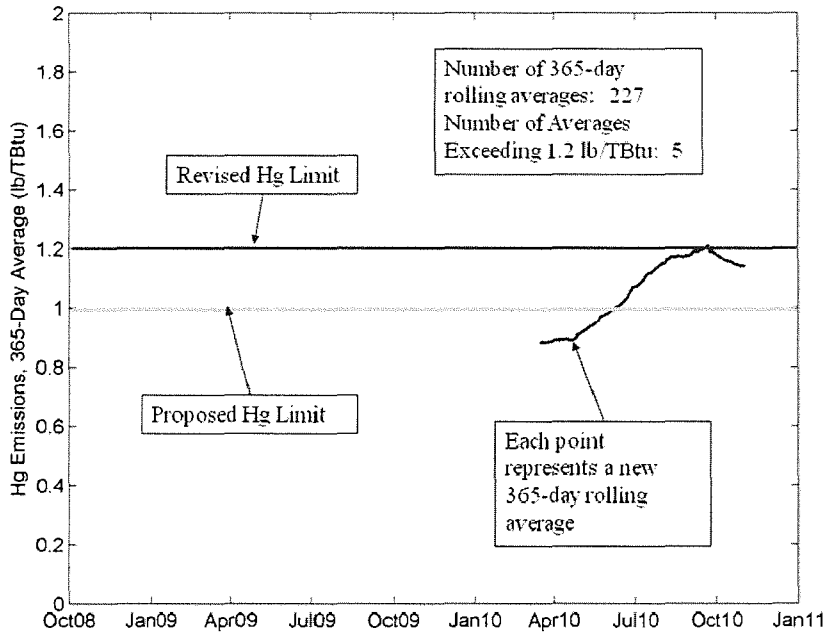


Figure 4 below represents 365-day rolling average mercury emissions from the same unit as above. The figure illustrates a longer averaging period for the same mercury standard is much more achievable.

Figure 4. Example of 365-day Average Mercury Emissions at Plant F, excluding Startup, Shutdown, and Malfunction



Background
Mercury Deposition

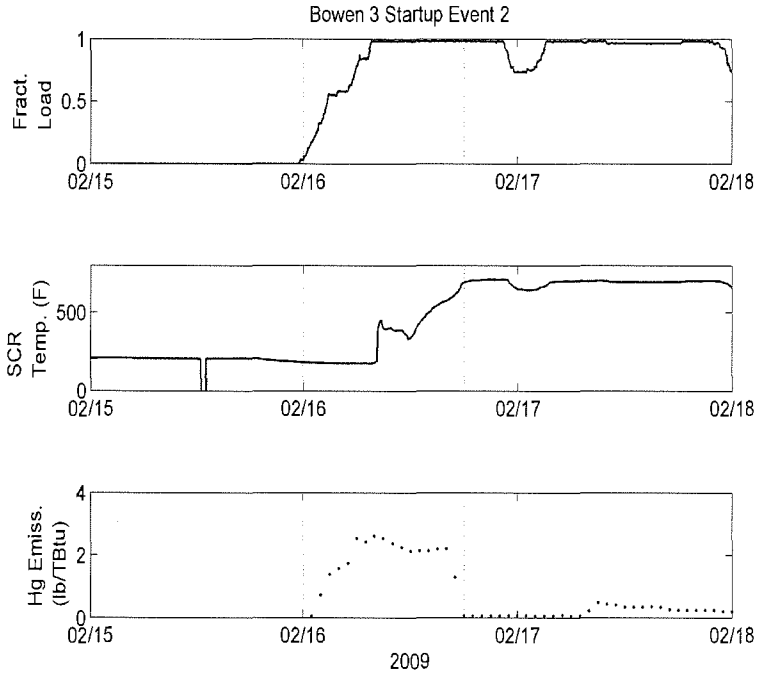
The difference between a mercury MACT emission limit of 1.2 and 1.4 lb/TBTU will not measurably change atmospheric deposition of mercury or concentrations of mercury in U.S. fish. This statement is supported by the following:

- The difference in mercury emitted by EGUs in the US would be between 1 to 2 tons of mercury.
- There are two primary forms of mercury emitted by EGUs; elemental mercury (Hg^0) and reactive gaseous mercury (RGM).
- Since RGM is easier to remove than Hg^0 and since the more stringent emission limits will have already eliminated most of the RGM and, thus, require reductions in the harder to remove Hg^0 to achieve, the vast majority of the difference between 1.2 and 1.4 mmBTU will be in the form of Hg^0, not RGM.
- Since Hg^0 enters the global pool and has a lifetime of 6 months to a year, deposition of Hg^0 in the US is minimal.
- Since RGM deposits on a local to regional scales, reductions of RGM can affect deposition in the US.
- Significant evidence exists for RGM to rapidly convert to Hg^0 in coal fired power plant plumes reducing the fraction depositing in the US. Models do not account for this mechanism and thus over-estimate the contribution of US EGUs to mercury deposition in the US. Regardless, the contribution of US EGU mercury emissions to mercury deposition in the US is relatively small.
- EPA models estimate a mean change in mercury deposition of less than 1 ug/m2 (i.e., from 19.41 to 18.66 ug/m2) resulting from a reduction in US EGU mercury emissions from about 53 tons in 2005 to 29 tons in 2010. Essentially all of this reduction in mercury deposition would be from the RGM reduced not from the Hg^0 reduced. It is also an overestimate. Even less change in mercury deposition is expected going from 29 to about 6 tons (i.e., after meeting a 1.2 lb/mmBTU limit) since most of the additional change is expected to be from Hg^0, not RGM. Since a change of 1 to 2 tons is largely Hg^0, the difference in mercury deposition in the US would not be measureable.
- In addition, the effect of mercury in fish from such a small difference in deposition will be minimal at best. As a case in point, a recent analysis of mercury emissions, deposition, and fish trends in Florida showed that for significant decrease in mercury emission over the last decade there has been no change in mercury deposition and a varied change in fish mercury levels (i.e., no change, increases, and decreases).

Background
Startup, Shutdown, Malfunction

- EPA should establish work practice standards during startup, shutdown, and malfunction since it is not feasible to establish emission limits during these modes of operation. The statute specifically notes that the phrase "not feasible to prescribe or enforce an emission standard" includes situations where "the application of measurement methodology to a particular class of sources is not practicable due to technological and economic limitations."
- Southern has evaluated how long it would take to conduct stack tests during a startup and determined that it would take 8 to 10 hours to complete three 2-hour test runs for total PM due to port changes, cleanup, and recovery between runs. Metallic HAPs and acid gases would require a minimum of 16 hours for a complete test. In addition, it is impossible to conduct a stack test during startup because of load fluctuations. Startups are transient periods where heat input, types and proportions of fuels, and gas flows continually change. These conditions make it extremely difficult, if not impossible, to maintain flow-proportional sampling and produce repeatable results.
- Southern has Hg CEMS data that demonstrates that startup is a distinct operating period that should be considered independently when establishing emission limits. This is shown in Figure 5 below. The unit presented below controls mercury with the combined "co-benefit" of the SCR and FGD systems. Both of these systems must be fully operable in order to gain the sought-after mercury control benefit. The figure shows the period during startup in which the SCR is partially bypassed as the temperature is increased in a controlled manner. This is a standard procedure to protect the SCR catalyst. The figure below clearly shows two distinct emission profiles, one where only partial mercury control is achieved during startup and the steady-state period in which the full control is achieved.

Figure 5: Time series of mercury emissions during Bowen Unit 3 startup event



- EPA should allows state permitting authorities to develop a work practice plan that outlines operational procedures and relevant Title V permit conditions for startups, shutdowns and malfunctions.
- Existing permits already contain startup provisions. Any startup plan that EPA may develop outside of the state permits may conflict with existing permit requirements. Therefore, the state permitting authorities should be allowed to work with plant operators to determine the best work practice plan for each unit.

Examples startup and shutdown language in existing Title V permits:

- During startup and shutdown, the SCR system may be bypassed in accordance with manufacturer's recommended procedures to allow for controlled catalyst heating and cooling.
- The permittee is authorized to bypass the FGD scrubber during the startup and shutdown of each emissions unit. The permittee may exclude SO2 emissions collected during startup and shutdown from the 30-day rolling compliance total.
- Excess emissions from startup, shutdown, and malfunction are allowed if best operational practices to minimize emissions are adhered to, all air pollution control equipment is operated in a manner consistent with good air pollution control practice for minimizing emissions, and the duration of the excess emissions is minimized. Proper maintenance, proper operation, and reasonable control of equipment failures are employed during startup and shutdown.
- Excess emissions resulting from startup, shutdown, malfunction of any source which occur though ordinary diligence is employed shall be allowed provided that (I) the best operational practices to minimize emissions are adhered to, and (II) all associated air pollution control equipment is operated in a manner consistent with good air pollution control practice for minimizing emissions and (III) the duration of excess emissions is minimized.