

## **SUBPART J CEMS COMPLIANCE ANALYSIS**

### **Abstract**

This submission presents a general overview of the July 1992 status of implementation of the NSPS Subpart J requirements for H<sub>2</sub>S/SO<sub>2</sub> monitoring at petroleum refineries. Subpart J requires that petroleum refineries install, calibrate, maintain, operate, and certify continuous emission monitoring systems (CEMS) for either hydrogen sulfide in the fuel gas burned in the fuel gas combustion devices (FGCDs) or for sulfur dioxide in the flue gas discharged to the atmosphere from the FGCDs. The compliance deadline for these requirements passed on October 2, 1991.

The implementation of the NSPS Subpart J requirements for CEMS is in progress. U.S. EPA Regional Offices have been actively determining the regulatory and compliance status of operating refineries and pursuing identified violators. In July 1992, EPA had determined that 203 refineries and topping units operate in the U.S., Puerto Rico, and the Virgin Islands. At least 85 of these 203 refineries are affected by the Subpart J requirements for H<sub>2</sub>S/SO<sub>2</sub> CEMS. These 85 facilities run 433 FGCDs. Only 39 out of the 85 refineries managed to certify their CEMS before the October 2, 1991 compliance deadline. In July 1992, a total of 72 facilities were in compliance. These 72 complying refineries have installed, operated, and certified 92 CEMS. Out of these 92 CEMS, 87 CEMS were installed for monitoring of H<sub>2</sub>S in fuel gas and the remaining 5 CEMS monitor SO<sub>2</sub> emissions.

On May 20, 1992, EPA issued administrative penalty orders for 17 violators with an average penalty of over \$85,000 per order. More enforcement actions are underway.

### **NSPS Subpart J Requirements and Background**

Subpart J of 40 C.F.R. Part 60 presents emissions limitations and monitoring requirements for the following units of New Source Performance Standard (NSPS) petroleum refineries:

- Fuel gas combustion devices (FGCDs).
- Fluid catalytic cracking unit catalyst regenerators.
- Claus sulfur recovery plants of greater than 20 long tons per day capacity.

The original monitoring requirements promulgated in the 1970's for FGCDs allowed the options of using CEMS to either continuously monitor sulfur dioxide (SO<sub>2</sub>) in the combustion gases or to monitor hydrogen sulfide (H<sub>2</sub>S) in the fuel gases prior to combustion. Due to the lack of performance specifications for H<sub>2</sub>S CEMS (EPA determined that acceptable monitors for H<sub>2</sub>S were not available at that time), refineries that chose to monitor H<sub>2</sub>S in the fuel gases were exempt from the monitoring requirements. Due to the lack of an emission limitation for SO<sub>2</sub> in the original rule, refineries that chose to monitor SO<sub>2</sub> did not have a standard to comply with.

When CEMS for H<sub>2</sub>S became available, EPA revised the original requirements and promulgated revised regulations requiring that refineries install CEMS for either SO<sub>2</sub> or H<sub>2</sub>S on all NSPS FGCDs. The revised rule also added Performance Specification 7 (PS7) to Appendix B of 40 C.F.R. Part 60. The PS7 presents standards for accuracy and calibration drift for the H<sub>2</sub>S CEMS to provide an initial check of the instrument's capabilities at the time of installation. In the same rule, EPA also presented an emission standard for SO<sub>2</sub> as an equivalent of the original H<sub>2</sub>S emission limitation. The revised Subpart J rule was published in the Federal Register on October 2, 1990. The Subpart J revisions of October 2, 1990, gave refineries one year to comply. The compliance deadline for the revised rule passed on October 2, 1991.

### **Implementation and Enforcement of Subpart J CEMS Requirements**

Shortly after the revised rule was published, U.S. EPA regional offices (Regions) notified state environmental agencies about the upcoming compliance deadline and asked the state environmental agencies to dispatch letters of notification to the affected refineries.

Following the compliance deadline and a Regional Subpart J implementation initiative, EPA immediately began assessing the situation, identifying violators, enforcing compliance, and pleading penalties for the violators. The Regions have conducted on-site inspections and forwarded over 50 requests for information to refineries with affected and potentially affected units to determine their compliance status.

In the result of the implementation of Subpart J revisions, the Regions identified several violators of the October 2, 1991, deadline for installation and operation of CEMS. By May 20, 1992, the Regions prepared enforcement cases against 17 violators under the administrative penalty authority (a new enforcement tool), and improved the compliance rate among the affected refineries.

### **Scope of the Analysis**

In July 1992, U.S. EPA conducted an analysis of the compliance status with the CEMS provisions of the revised Subpart J. This analysis focused on the requirement to install, operate, and certify CEMS to monitor and record either the concentration of SO<sub>2</sub> in the flue gases emitted into the atmosphere from FGCDs or the concentration of H<sub>2</sub>S in fuel gases before the gases are combusted in the FGCDs. This analysis assessed the status of compliance on the compliance deadline of October 2, 1991 and in July 1992 and summarized the EPA efforts to date to enforce the requirement.

#### **Affected Refineries and FGCDs**

This analysis indicates that there are 203 petroleum refineries operating in the U.S. EPA Regions (Figure 1). Thus far, the EPA has determined that 85 out of 203 these refineries have Subpart J-affected FGCDs and that 43 refineries are not affected. The

status of the 75 remaining refineries is under investigation at this time. The 85 affected refineries operate 433 FGCDs that are required to install and monitor SO<sub>2</sub> or H<sub>2</sub>S. The number of affected FGCDs at a single refinery ranges from one to 38.

### Installation and Certification Status

Based upon the information known in July 1992, only 39 out of the affected 85 refineries installed and certified CEMS by October 2, 1991. The remaining 46 refineries were out of compliance on October 2, 1991 (Figure 2). By July 1992, 33 more refineries had installed and certified their CEMS or submitted certification test results bringing the total number of complying refineries to 72 with 11 facilities still out of compliance. Between October 2, 1991, and July 1992, one refinery had switched from burning refinery fuel gas to natural gas and this refinery is presently not affected. The certification status of an installed CEMS at another refinery is unknown.

The 72 complying refineries installed a total of 92 CEMS to monitor 433 FGCDs. Of the 72 refineries that installed and certified CEMS by July 1992, the overwhelming majority installed CEMS to monitor H<sub>2</sub>S in fuel gas rather than SO<sub>2</sub> emissions from FGCDs. Of 92 CEMS installed in the Regions, 87 CEMS monitor H<sub>2</sub>S in fuel gas, and only five CEMS monitor SO<sub>2</sub> emissions (Figure 3).

On the average, one CEMS monitors five units. This is possible if either an H<sub>2</sub>S CEMS is installed on the fuel line feeding multiple units or an SO<sub>2</sub> CEMS provides representative readings for other units.

### Administrative Penalty Orders

The EPA announced on May 20, 1992 that it had taken 52 administrative enforcement actions under the new administrative penalty authority granted by § 113(d) of the Clean Air Act. The administrative penalties pled in these 52 orders reflected the seriousness of the violation, and the economic benefit that the violator derived from non-compliance (so the violator does not receive an unfair advantage from violating the Act). Seventeen of these 52 actions, the biggest block under a single rule, were directed against refineries for failure to comply with the requirement to certify monitors on FGCDs under Subpart J. Penalties totaling \$1,453,336 were pled under the 17 actions. The average penalty pled in those 17 actions was \$85,490 (Figure 4). The average penalty pled for all the 52 cases, that included violators of Subpart J and of other regulations, was about \$75,000, indicating that the fines pled for the Subpart J violators were higher than for the violators of the remaining regulations involved in the national administrative penalty initiative. The preparation of those 17 cases was a direct result of the successful early implementation action following the Regional initiative.

### Summary and Conclusions

U.S. EPA is committed to enforcing rules involving CEMS. The implementation and enforcement of the CEMS installation and certification provisions of Subpart J will continue. The completion of the project is expected in September of 1993.

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