



**Office of the Inspector General  
Report of Administrative Inquiry**

March 4, 2008

Preston D. Swafford, LP 3K-C

WIDOWS CREEK FOSSIL PLANT (WCF)  
ENVIRONMENTAL MATTERS – AIR  
OIG FILE NO. 23C-8

We have completed our investigation of an allegation that there were leaks in the flue gas ductwork (FGD) at WCF for several years, in violation of environmental requirements, and TVA failed to report those leaks. We conducted this investigation jointly with the Criminal Investigations Division, Environmental Protection Agency (EPA).

We are issuing this report as a supplement to our December 17, 2007, audit report, Review of Reportable Environmental Events at TVA Facilities (No. 2007-019F). That report found two significant duct leaks, one at Cumberland Fossil Plant (CUF) and one at the Paradise Fossil Plant (PAF), were not reported externally. As noted in that report, the Air Media Specialists and the Manager, Fossil Power Group (FPG) Environmental Affairs, believed the leaks did not have to be reported. That report identified a lack of transparent environmental reporting as an issue and recommended TVA's Environmental Executive work with other TVA executives to promote a culture of transparent reporting throughout TVA organizations. Management agreed with the recommendations in that report.

**FINDINGS**

This investigation addressed ductwork leaks at WCF and further supports those audit findings. In summary, we found the following.

- TVA advised it was in the forefront with new technology when it installed a Selective Catalytic Reduction (SCR) system on WCF Unit 7 in 2003 to reduce NOx emissions. After installation of that system, however, deterioration of the FGD accelerated. There was a learning curve involved, and TVA did not expect the resulting amount of corrosion.
- TVA contracted with the Worley Parsons Group (WPG) to inspect the FGD during 2002 and 2004. The latter inspection report, dated May 27, 2004, reflected significantly increased deterioration.

- Comments by WCF employees we interviewed showed the leaks became progressively worse and were extensive.
- Apparently based on the 2004 WPG inspection, TVA decided to replace large portions of the FGD during the then-upcoming planned October 2005 outage. Those areas that could not be replaced during that outage were patched.
- Management advised replacing the ductwork was a major operation. The initial scoping began in May 2004, the request for proposals was issued in March 2005, and the ductwork was delivered in October 2005, just before the outage began. Major parts of the ductwork were replaced during the outage. The following timeline illustrates the scope of this project.

May 13, 2004	Initial scoping meeting for capital project
June 25, 2004	Conceptual cost estimate complete
July 1 - Sept. 30, 2004	GUBMK prepares preliminary cost estimate and constructability review
October 1, 2004	Phase 1 study approved
November 4, 2004	Kickoff meeting for Phase 1 study
March 18, 2005	Request for Proposals issued
March 25, 2005	Pre-bid meeting
June 14, 2005	Contract award
October 14, 2005	Ductwork delivery
October 15, 2005	Outage start

- No one we interviewed recalled any discussions of the leaks as possible air permit violations; rogue leaks from the FGD seemed insignificant compared to the stack emissions.<sup>1</sup> The leaks were addressed from a safety standpoint and not as a permit issue.
- TVA subsequently developed a Duct Leak Program containing guidance on inspection frequency, recordkeeping and reporting, and priority of repairs.
- The Alabama Department of Environmental Management (ADEM) and EPA each issued TVA a Notice of Violation (NOV) related to these leaks.

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<sup>1</sup> TVA, after noting there was no established methodology for estimating emissions from leaks when ductwork is deteriorating while also being temporarily repaired, conservatively estimated a total of 931 tons of SO<sub>2</sub> and 13 tons of ozone season NO<sub>x</sub> were emitted between April 27, 2004, and October 14, 2005. Comparatively, all the WCF units during 2006 issued 33.5 thousand tons of SO<sub>2</sub> and 17.1836 thousand tons of NO<sub>x</sub>.

- By letter dated January 13, 2006, TVA disagreed with ADEM's proposed NOV. In that response, TVA stated that prior to the inspection and NOV it had undertaken the actions necessary and appropriate to continue to maintain the ductwork associated with the scrubber consistent with the permit. TVA stated it further disagreed with the alleged violation because WCF operated and maintained air pollution equipment consistent with utility industry practices. TVA explained that the efforts to properly maintain the ductwork were demonstrated by WCF's outage plans, and the work on the Unit 7 flue gas ductwork and scrubber followed a planning and procurement timeline customary within the industry.

FPG noted that TVA's January 13, 2006, position supported the understanding by WCF personnel that no notification of the leaks was warranted.

- On March 14, 2006, ADEM conducted an announced inspection to observe work conducted to reduce the duct leaks. The unit was not operating during the inspection. The memorandum documenting the inspection noted that significant ductwork had been replaced in the areas where the most visible leaks were observed during the 2005 inspection that led to the NOV. The inspectors noted that leaks should be repaired as soon as practicable and leaks should be included in the work order system.
- On January 10, 2008, ADEM issued a proposed consent order under which TVA agreed to pay a \$100,000 civil penalty. Although ADEM noted it was not aware of any irreparable harm to the environment resulting from this violation, it stated that TVA did not exhibit a standard of care commensurate with applicable regulatory requirements, specifically operating and maintaining control equipment in a manner so as to minimize emissions. ADEM further noted there was a significant delay between discovering the leaks and repairing them during a scheduled outage. The EPA NOV is still pending.

We also reviewed Environmental Management System (EMS) audit reports for WCF and found the following.

- EMS audits conducted December 8-12, 2003, and March 28-31, 2005, did not mention the duct leaks. The TVA Office of Environment and Research (OE&R) noted that the auditors did not observe any air duct leaks in 2003 and by 2005 WCF had self-identified the leaks and had a plan to correct the problem. OE&R further noted that the auditors were aware of leaking duct issues in TVA and they identified issues related to duct work in the PAF audit in 2002 and at CUF in a 2006 unannounced audit. (FPG added that no audit finding was included in 2005 because the problem had been self-identified and a need to make a regulatory notification had not been identified.)

- A July 2007 EMS audit report included the following observations.
  - No obvious duct leaks were identified during the audit. Missing lagging which could deteriorate and subsequently result in corrosion inside the duct work was noted, but plans are being developed to correct these areas.
  - A formal inspection process is being implemented for units 7 and 8 scrubber duct work. Inspections are to occur every two weeks by the Systems Engineer and be documented with a check sheet; any identified leaks are to be reported to the Shift Operations Supervisor for temporary repairs and daily inspections on the temporary repairs will be performed until permanent repairs are completed.

## **OBSERVATIONS**

Based on our investigation, we had the following observations.

- Follow-up inspections indicate the duct work problems have been addressed.
- While management made efforts to repair the leaks, the emphasis was on efforts to contain the leaks while keeping the plant operating until the next major outage in October 2005.
- The WPG report was dated May 27, 2004, but the ductwork was not ordered until June 2005 and delivered in October 2005, when the outage began.
- In spite of the continuous nature and extent of the leaks, it appears that little, if any, consideration was given to reporting the leaks to ADEM. Rather, the leaks were addressed as a safety or maintenance issue and not a permit issue. We also found no evidence that ethics and compliance issues were considered, presumably because of the emphasis on business operations.
- We also noted that under the Winning Performance scorecard, management had a financial incentive to keep the plant operating.

The EPA permit program, as delegated to the states, requires self-reporting of permit deviations. As with the CUF and PAF leaks, WCF personnel indicated they never thought of reporting the matter to ADEM because they did not think the leaks constituted a permit deviation. In our opinion, in addition to the regulatory requirement,

TVA has a responsibility from an ethics and compliance standpoint to report issues that may be of concern. We believe TVA to show leadership in this area should err on the side of reporting such issues in order to avoid the appearance of ignoring or hiding any such matters. TVA could then work with the regulatory agencies in deciding what course of repair would be appropriate. We recognize in this regard that TVA operating organizations may wish to consult with the TVA Office of the General Counsel when they have concerns related to how to interpret regulations and whether guidance from regulatory agencies should be sought.

## **REMARKS**

This office in concert with EPA Criminal Investigations Division presented this matter to the United States Attorney's Office for the Northern District of Alabama, who declined prosecution.

We obtained informal comments from FPG and OE&R. We incorporated those comments in the report as appropriate.

## **RECOMMENDATION**

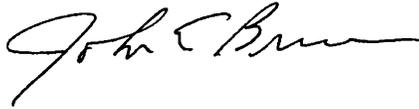
Management previously concurred with the recommendation in our audit report that TVA's Environmental Executive work with other TVA executives to promote a culture of transparent reporting throughout TVA organizations. Based on our investigation at WCF, we further recommend the Executive Vice President, FPG, consult with the Ethics and Compliance Officer regarding methods to incorporate ethics and compliance considerations into daily operations at the fossil plants.

We would appreciate being informed within 30 days of your determination of what action is appropriate on the basis of our report. In addition, if you decide to take documented action on the basis of this report, we would appreciate your sending a copy of the relevant information to this office for our file.

This report has been designated "TVA Restricted" in accordance with TVA Business Practice 29, Information Security. Accordingly, it should not be disclosed further without the prior approval of the Inspector General or his designee. In addition, no redacted version of this report should be distributed without notification to the Inspector General of the redactions that have been made.

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Our investigation of this matter is closed.

A handwritten signature in black ink, appearing to read "John E. Brennan". The signature is fluid and cursive, with the first name "John" being the most prominent.

John E. Brennan  
Assistant Inspector General  
(Investigations)  
ET 4C-K

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