



Memorandum from the Office of the Inspector General

May 14, 2012

James R. Dalrymple, LP 2T-C

FINAL REPORT – EVALUATION 2011-14057 – SAFETY OF GAS LINE AND GAS PLANT OPERATIONS

In light of recent gas-related explosions in the utility industry, we conducted a review of Tennessee Valley Authority's (TVA) safety of gas line and gas plant operations. In 2011, TVA announced it will close 18 older coal-fired generator plants by 2020 as part of a court settlement for violating the Clean Air Act. As the coal plants are phased out, one of the ways TVA will replace the coal-fired generator plants is with modern natural gas power plants. According to the Natural Gas Alliance, natural gas can play a significant role in helping TVA meet its goal in becoming one of the nation's leading providers of low-cost and cleaner energy by 2020. With TVA's increased dependence on gas-fired plants, we initiated a review to determine if TVA has taken appropriate steps to identify and mitigate risk associated with the operation of gas plants and gas lines.

In the United States, there have been more than 2,800 significant gas-pipeline accidents recorded since 1990 with one-third causing deaths or significant injuries. During a 6-month period from September 2010 to March 2011, there were three massive gas-pipeline explosions. These explosions took place in San Bruno, California; Philadelphia, Pennsylvania; and Allentown, Pennsylvania. These explosions destroyed entire neighborhoods, caused dozens of injuries, and killed 14 people.

The vast majority of gas-related explosions were gas line related. According to TVA personnel, TVA is not responsible for gas until it reaches the reducing stations¹ on TVA property. This significantly decreases TVA's risk of a gas-related incident. We did identify two explosions that occurred at gas plants due to improper commissioning. On February 7, 2010, there was an explosion at the Kleen Energy power plant in Middletown, Connecticut, that caused six deaths and multiple injuries. On June 9, 2009, there was an explosion at the ConAgra Foods Slim Jim plant in Garner, North Carolina, that killed four workers and caused 67 injuries. In both instances, fuel gas was used to clean or purge gas pipes of debris, air, or other substances. TVA has taken steps to mitigate this risk by using compressed air instead of gas to clean or purge gas pipes.

¹ A reducing station is used to reduce the amount of gas pressure from the supplier and filter out unnecessary particles.

As part of TVA's Risk Management program, the organization has identified asset performance vulnerability. Asset performance vulnerability impacts TVA's ability to provide power when there is a demand. The risk for asset performance vulnerability is driven by equipment-failure-related incidents that cause forced-outage events and planned-outage extensions of significant duration. According to TVA's Risk Management program, the severity for asset performance vulnerability is moderate. TVA has mitigated these risks by (1) utilizing the critical spares program to obtain key-replacement components to reduce forced-outage time, (2) replacing components during planned outages as allowed by the budget, and (3) developing a preventative-maintenance program with the Electric Power Research Institute.

In addition, TVA has completed the draft of a *Natural Gas Piping System Management* manual. This manual provides the primary standards and methodology required for the commissioning, maintenance, and integrity management of natural gas piping systems found at TVA fossil power group properties. The *Natural Gas Piping System Management* manual also includes emergency-response information in the event a natural gas emergency does occur. The manual is expected to be finalized in the summer of 2012.

This report does not include any recommendations and is to be used for informational purposes only. Accordingly, no response is necessary.

Information contained in this report may be subject to public disclosure. Please advise us of any sensitive information in this report that you recommend be withheld.

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If you have any questions, please contact Michael L. Lane, Auditor, at (423) 785-4816 or Greg R. Stinson, Director, Evaluations, at (423) 785-4867. We appreciate the courtesy and cooperation received from your staff during this review.



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