Memorandum from the Office of the Inspector General

March 27, 2014

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FINAL REPORT – EVALUATION 2012-14842 – ACTIONS TO ADDRESS NUCLEAR PLANT SYSTEMS, COMPONENTS, AND PROGRAMS WITH POOR RATINGS

During a prior review of how Tennessee Valley Authority (TVA) organizations assess the condition of their assets,[1] we learned that asset condition assessments done by the Nuclear Power Group (NPG) had determined some generation assets are in poor condition. As a follow up to the prior work, we performed a review to determine whether TVA is taking actions to address NPG systems, components, and programs with poor ratings. Under NPG's health report process, actions are required when ratings are designated red or yellow. Red ratings are defined as requiring excessive monitoring/resources to maintain, and yellow ratings need additional attention.

We found 333 systems, programs, and components within NPG had been designated red or yellow and randomly sampled 25 for detailed review. Our analysis showed at least two actions were taken to address 24 of the 25 in our sample. For 1 component, only one action was complete and other actions were awaiting approval. These actions resulted in an improvement in condition to a white or green rating in 14 cases while 11 had ratings that remained red or yellow. It is important to note that of the 11 remaining red and yellow ratings, 2 moved from red to yellow, and 9 remained the same. In addition, 5 of the 9 that remained red or yellow had some asset condition improvement, but not sufficient to move to a new category.

BACKGROUND

TVA's NPG Standard Program and Process System, Program, and Component Health, NPG-SPP-09.16.1, states that health monitoring provides a method to improve and maintain equipment performance by accomplishing the following:

- Identifying shortfalls in equipment performance or in programs that are important to maintain equipment performance which result in actions for improvement.
- Identifying issues from internal or external operating experience that have not been adequately addressed which require actions.

[1] Inspection 2009-12883 Survey of TVA's Process for Determining Condition of Assets issued on September 20, 2012.

- Identifying issues which will affect future performance of equipment such as aging, wearout, or obsolescence, which require actions to address in a proactive manner.

- Identifying opportunities offered by emerging technologies, benchmarking, or innovations that improve equipment performance.

NPG requires system health reports to be prepared three times a year and requires component and program health reports to be prepared two times a year. Each system, program, and component report is assigned a color rating of green, white, yellow, or red based on the overall report score. According to NPG-SPP-09.16.1, a green rating requires no additional attention, a white rating designates current performance/activities are appropriate, a yellow rating needs additional attention, and a red rating requires excessive monitoring/resources to maintain. Additionally, an action plan must be initiated for any system, component, or program that has been assigned a yellow or red rating.

For the scope of our review, red and yellow reports accounted for 10.86 percent of system health reports, 23.21 percent of program health reports, and 42.19 percent of component health reports that can be seen in Figure 1 below.

Figure 1: Percentage of Red and Yellow Systems, Programs, and Components

	System		Program		Component	
	Total	**Percentage**	**Total**	**Percentage**	**Total**	**Percentage**
Browns Ferry Nuclear - Red and Yellow	130	12.82%	20	27.78%	23	57.50%
Sequoyah Nuclear - Red and Yellow	50	7.76%	16	21.05%	20	45.45%
Watts Bar Nuclear - Red and Yellow	47	10.85%	16	21.05%	11	25.00%
Total Red and Yellow	227	10.86%	52	23.21%	54	42.19%

System, program, and component health reports are used in the development of NPG's Long Term Equipment Reliability risk.

OBJECTIVE, SCOPE, AND METHODOLOGY

During a prior review of how TVA organizations assess the condition of their assets, [2] we learned asset condition assessments done by the NPG had determined some generation assets are in poor condition. As a follow up to the prior work, we performed this review to determine whether TVA is taking actions to address NPG systems, components, and programs with poor ratings.[3] Due to varied reporting time frames, we reviewed system

[2] Inspection 2009-12883 Survey of TVA's Process for Determining Condition of Assets issued on September 20, 2012.

[3] While NPG's health report process requires actions to be taken for some white systems and any system with a red indicator, we did not include those items in our sample population.

health information for the time period of October 1, 2010, through January 31, 2013; component health information from October 1, 2010, through December 31, 2012; and program health information from January 1, 2011, through December 31, 2012.

To achieve our objective, we:

- Interviewed key TVA personnel and reviewed the organization's process to determine requirements for red and yellow health reports.
- Selected a random sample of 25 out of 333 red and yellow system, program, and component health reports to determine if actions were being taken. The sample consisted of 17 systems, 4 programs, and 4 components.
- Reviewed recent reports for the 25 sample reports to determine if the health of the system, program, or component had improved.

This review was performed in accordance with the Council of the Inspectors General for Integrity and Efficiency's *Quality Standards for Inspection and Evaluation*.

FINDINGS

Actions were taken for all 25 of the systems, programs, and components in our sample which resulted in an improvement in condition to a white or green rating for 14 of the systems, programs, and components. However, 11 had ratings that remained red or yellow.

We verified a minimum of two actions were taken for 24 of the 25 systems, programs, and components in our sample. For 1 component, only one action was taken and other actions were awaiting approval. Examples of actions taken included performing preventive maintenance, installing new equipment, developing Problem Evaluation Reports, and assigning a new engineer to be in charge of a component.

We reviewed system, program, and component health reports from the beginning of 2013 to identify whether health had improved. As seen in Figure 2 below, 56 percent of the sample had a rating that had improved to green and white ratings. Additionally, 8 percent of the sample increased the rating from red to yellow. However, 36 percent of the sample did not improve from the original rating.

Figure 2: Recent System, Program, and Component Health Ratings

Condition Improvement	Number of Health Reports	Percentage of Health Reports
Improved to Green	4	16%
Improved to White	10	40%
Improved From Red to Yellow	2	8%
Remained the Same	9	36%

Of the nine health reports that did not have an improvement in rating, five did show an improvement in health condition but not enough to result in an improved color rating, and the remaining four did not show improvement. Interviews with the system, program, and

component engineers indicated several reasons for a lack of improvement. These included a lengthy design change process, funding for critical spares, assignment of Problem Evaluation Reports, new issues developing, and failures of new equipment installed.

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

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

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If you have any questions or wish to discuss our observations, please contact Deana D. Scoggins, Senior Auditor, Evaluations, at (423) 785-4822 or Gregory R. Stinson, Director, Evaluations, at (865) 633-7367. We appreciate the courtesy and cooperation received from your staff during the evaluation.

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