MISSOURI PUBLIC SERVICE COMMISSION

STAFF'S INVESTIGATIVE REPORT FOR HIGH PRESSURE TURBINE DIFFERNTIAL EXPANSION EVENTS

Kansas City Power & Light Company

Case No. ES-2010-0009

Jefferson City, Missouri
August 12, 2010

Staff's Investigative Report For

High Pressure Turbine Differential Expansion Events

1.0 Purpose

The purpose of this report is to document Public Service Commission Staff's (Staff) findings as a result of its investigation of Missouri regulated electric utilities' procedures to handle high differential expansion events at coal-fired steam generating plants as ordered by the Missouri Public Service Commission (Commission) on April 14, 2010.

2.0 Background

On Wednesday, February 4, 2009, Kansas City Power & Light Company (KCPL or Company) commenced a cold startup of its Iatan Unit 1 to end its winter planned outage. During this outage, the high pressure turbine section was replaced. The Iatan Unit 1 was heated up and the generator was synchronized to the grid. When the load on the generator increased to approximately 100 megawatts (MW), the turbine experienced high vibration problems and tripped due to high vibration on the number 2 turbine bearing. The turbine/generator rotor began to decelerate immediately following the trip, and a severe vibration event occurred on turbine bearings number 1, 2 and 3 causing severe damage to various turbine components, as stated in Staff's Corrected Incident Report filed on February 4, 2010.

Staff filed its Electric Incident Report on January 29, 2010 and its corrected Electric Incident Report on February 4, 2010. The Commission issued an order on March 31, 2010 adopting Staff recommendations and granting KCPL until July 30, 2010 to file its report containing the results of its investigation and any subsequent actions taken at other KCPL plants to prevent recurrence. On April 14, 2010 the Commission ordered the Staff to file its report on the investigation of other utility procedures for incidents similar to the Iatan Unit 1 incident by August 15, 2010.

3.0 Facts

3.1 PSC Staff Investigation

Staff's Energy Department issued a letter to each Missouri regulated electric utility asking the utility, AmerenUE, Empire Electric District and KCP&L Greater Missouri Operations (GMO), to report its experience with high differential expansion and the procedures/processes in place to prevent damage due to high differential expansion. Staff reviewed each utility's response to the letter and also reviewed KCPL's report of its investigation and subsequent actions taken regarding high differential expansion.

3.2 Analysis

Through reviewing AmerenUE, Empire Electric District and GMO responses to its letters, Staff learned that AmerenUE is the only other Missouri regulated electric utility which owns and operates a high pressure steam turbine similar to the high pressure steam turbine at Iatan Unit 1, (General Electric "Dense Pack"), and that AmerenUE has not experienced any high differential expansion events at its "Dense Pack" high pressure steam turbines. Further, AmerenUE already had written procedures in place to minimize the occurrence of such an event and to minimize any possible damage because of such an event.

Staff also learned that there are thirty (30) high pressure steam turbines owned and operated by Missouri regulated electric utilities which are other than General Electric "Dense Pack". Of the thirty (30) high pressure steam turbines only AmerenUE's Rush Island Unit 1 experienced a high differential expansion event. The result of that event was the unit shut down without incident and was back online within 5 hours with no subsequent damage. The root cause analysis conducted by the utility concluded the cause of the event was a transient signal error and procedures in place prevented any damage.

4.0 Conclusion

Based on Staff's review of the facts presented by the Missouri regulated electric utilities, Staff concludes that the high differential expansion event that occurred at the Iatan Unit 1 is not a common event and that reasonable procedures are in place at Missouri's regulated electric utilities to minimize occurrence of and damage due to high differential expansion events.

Staff reviewed the KCPL report of its investigation and subsequent actions taken regarding high differential expansion and concludes that the action taken by KCPL adequately address the problems experienced by KCPL at its Iatan Unit 1 and at other high pressure steam turbines operated by KCPL.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of an Incident on February 4, 2009 at the Iatan Generating Plant Operated by Kansas City Power & Light Company.	))))	Case No. ES-2010-0009

AFFIDAVIT OF LEON C. BENDER

STATE OF MISSOURI)
) **ss**
COUNTY OF COLE)

Leon C. Bender, of lawful age, on oath states: that he participated in the preparation of the foregoing Staff Report, to be presented in the above case; that the information in the Staff Report was provided to him; that he has knowledge of the matters set forth in such Staff Report; and that such matters are true to the best of his knowledge and belief.

Leon C Bender
Leon C. Bender

Subscribed and sworn to before me this 12th day of August, 2010.

Susan L Sundermeyer
Notary Public

NOTARY PUBLIC NOTARY SEAL STATE OF MISSOURI

SUSAN L. SUNDERMEYER
My Commission Expires
September 21, 2010
Callaway County
Commission #06942086