

Lesson Learned

Winter Storm Inlet Air Duct Icing

Primary Interest Groups

Generator Operators (GOP)

Generator Owners (GO)

Problem Statement

During the morning load ramp of an extremely cold winter weather event in which there was not sufficient generation to meet the load demand and a load shed was being implemented, a large gas fired generator turbine (GT) facility had to be taken offline. Plant operations personnel had witnessed abnormal conditions at the GT's exhaust stack. The loss of this generation at a critical load ramp time added further complications for operations to manage the load shed.

Details

Air enters the inlet ductwork of this GT through a mesh "bird screen" at the top of the ductwork. Freezing temperatures and precipitation were experienced for several hours before this event occurred. Ice was gradually accumulating on the mesh of the intake bird screen, decreasing the cross-sectional area of the air inlet to the GT. After a significant amount of intake air was blocked due to the icing conditions, inlet duct pressure dropped and caused the duct to implode. Maintenance personnel saw the condition of the duct and had the unit taken offline.

Corrective Actions

Plant maintenance personnel removed the damaged mesh screen, inspected the GT air inlet and exhaust ducts, determined it was safe to put the unit back online and released the GT to dispatch to be brought back online. The GT inspection doors were also opened which allowed additional intake air and a more balanced pressure situation in the duct preventing this type of event from occurring. They also notified two other similar units of this change and modified their freeze protection guidelines. The inlet air duct damage was repaired later when the unit was offline.

Lesson Learned

- If they are not in place already, air duct sensors should be considered to provide operations warning of air pressure problems.
- Procedures for winter storm operation should include the hourly visual inspection of air intake systems to insure they do not clog with frozen precipitation.
- GOPs /GOs should evaluate their plants to determine if leaving their GT inspection doors open during a winter precipitation event will help in preventing air duct clogging from precipitation. If so, they should modify their plant freeze protection guidelines to require the GT inspection doors to be opened when operating in freezing precipitation conditions.

- Care should be taken to make sure that this additional airway is also protected by mesh “bird screens” to limit the chance of debris entering the GT and measures should be taken to keep it clear of frozen precipitation.

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