

## Industry Advisory

### 345kV Breaker Failures

Initial Distribution: August 27, 2013

**NERC has identified a potential trend of 345 kV SF6 puffer type breakers failing. High voltage circuit breaker failures are one of the leading contributors to severe disturbances on the Bulk Electric System (BES). Circuit breaker failures, in conjunction with another fault, may lead to more BES Facilities removed from service than required to clear the original fault. This poses a risk to the reliability of the BES. Attached is a Manufacturer's Maintenance Advisory that was issued in 2010 by Hitachi HVB, Inc., (formerly HVB AE Power Systems, Inc.). The purpose of this Advisory is to alert the industry to this trend of breakers failing and to help inform the industry of the Manufacturer's Maintenance Advisory.**

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Status: No Reporting is Required – For Information Only



**PUBLIC:** No Restrictions

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#### Distribution:

**Initial Distribution:** Generator Operator, Generator Owner, Transmission Operator, Transmission Owner

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**Primary Interest Groups:** Generation Engineering, Generation Operations, System Operations – Transmission Engineering, System Operators, System Operators – System Protection, Transmission Planning

**Advisory:** All recipients of this Advisory should review their inventory of circuit breakers to determine if this Manufacturer’s Maintenance Advisory should be performed based on each company’s unique situation and individual maintenance policies.

**Background:** NERC has reviewed nine 345 kV breaker failures affecting both generation and transmission facilities. Six of these failures have occurred within the past year. From these reviews, NERC has identified a potential trend of 345 kV SF6 puffer type breakers failing. A SF6 puffer type breaker compresses a bellows when opening, directing SF6 gas across the parting contacts to extinguish the arc. The SF6 gas is directed across the contacts via a nozzle. The reports indicate a potential trend with respect to a separation of the nozzle from its point of attachment. In most cases, the nozzle has been found lying on the tank floor. Hitachi HVB, Inc (formerly HVB AE Power Systems, Inc.) issued a Maintenance Advisory on the affected model of breaker in 2010. The manufacturer has indicated that there were approximately 1,000 of these breakers delivered. Based on Transmission Availability Data System data, it is estimated that this type of breaker could comprise 10% to 16% of the 345 kV breakers in service. NERC is attaching the Manufacturer’s Maintenance Advisory to this NERC Alert for your reference. NERC will collaborate with the North American Transmission and Generator Forums and industry trade associations to determine the extent of condition and assess residual risk to the grid. NERC will reevaluate this reliability risk and report to the NERC Board of Trustees at the February and August 2014 meetings.

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