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# Application of Cat<sup>®</sup> Generator Sets in Tier III and Tier IV Data Centers

## **ABSTRACT**

This positioning paper will provide detail regarding the application of Cat<sup>®</sup> generator sets into data center installations that will be certified as either a Tier III or Tier IV data center, as defined by the Uptime Institute's Tier Standard: Topology paper. Section 2.5.2, Manufacturers' Runtime Limitations, states:

"Engine generators for Tier III and IV sites shall not have a limitation on consecutive hours of operation when loaded to 'N' demand."

## THE BUSINESS CASE

The Uptime Institute references the ISO 8528-1 standard for generator set rating conditions and subsequent guidance. The rating definition for Cat generator sets exceeds the parameters outlined in ISO 8528-1. ISO 8528-1 imposes a runtime limit of 200 hours a year on Emergency Standby Power (ESP) ratings. Cat Standby and Cat Mission Critical ratings have a maximum expected usage of 500 hours per year. Further, both ratings state that: “output is available with varying load for the duration of the outage” and “output is available with varying load for the duration of the interruption of the normal source power.” A Cat Standby or Cat Mission Critical Standby generator set will provide uninterrupted power for the duration of an outage related to failure of the local utility source. In working with the Uptime Institute, Caterpillar can assure customers that our Cat Standby, Cat Mission Critical and all other nameplate ratings are in compliance with the requirements outlined by the Uptime Institute for Tier III and Tier IV data centers. Please work with your Cat dealer for a site specific letter regarding ‘N’ design load of your project.

Operating outside of the published Caterpillar rating definitions, in terms of hours and/or load factor, could have an impact of the service and overhaul intervals. While the product will continue to operate beyond this expected usage, we encourage customers to develop a detailed contingency plan for extended outages which allows for scheduled maintenance of individual pieces of equipment. Your Cat dealer is ready and available to assist you with such a plan.

When selecting the correct generator set for a Tier III or Tier IV installation, also be aware of federal and local emissions regulations. These regulations are regional in nature, and may impose operating limits on the generator set outside of the published generator set rating definitions. Your Cat dealer is knowledgeable about the emissions regulations for your installation, and can help to ensure the correct equipment is specified to allow continued operation under the Uptime Institute guidelines and within the emissions regulations for your region.

## REFERENCES

Uptime Institute, LLC. “Data Center Site Infrastructure Tier Standard: Topology”,  
TS102120-0812 <http://www.uptimeinstitute.com/publications>  
Caterpillar Inc. “Electric Power Generator Set Ratings Definitions”, LEXE0244,  
April 2011 <http://www.stowerscat.com/pdf.asp?id=223>

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