

Case Study: Advanced Load Bank Strategies to Improve Performance, Digital Infrastructure and Scalability

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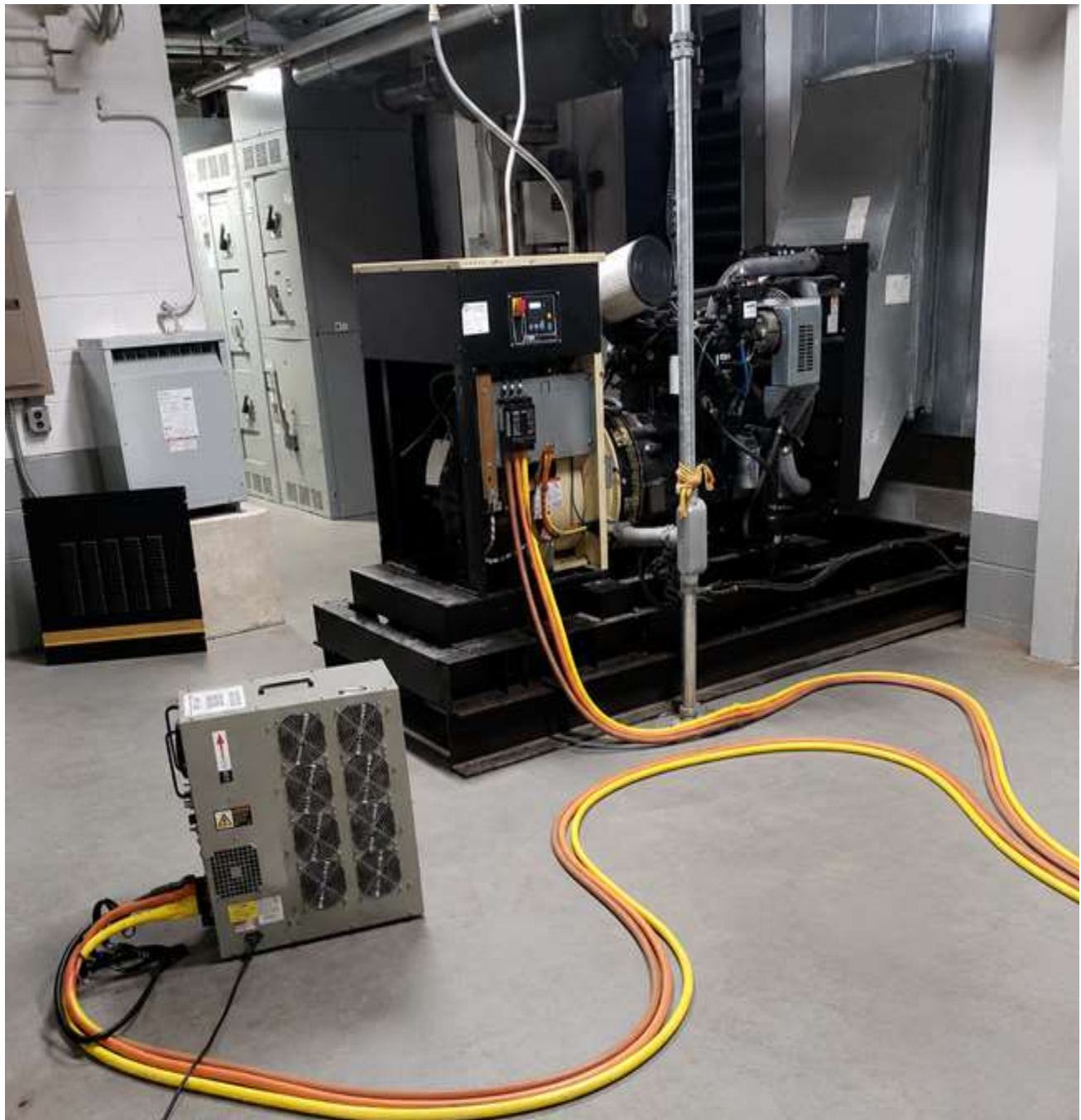


Figure 1: Advanced Load Bank Strategies

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I. INTRODUCTION

Overview

As the usage of social media keeps on growing on a global level, major technology companies require more powerful data centers so that they can easily handle the user traffic. To make sure that the online services remain running smooth and support millions of users, the company has started to develop hyperscale data centers at different locations.

As this facility needs to operate around the clock, that's why it is extremely important to get reliable power as well as efficient cooling systems. If in case any power issue arises, then it could immensely impact the performance of a platform and user experience.

That's why the companies are requiring a dependable load testing solution so that they can avoid these risks.

This case study focus is on the problems that arise from the continuous operating demands and challenges and the new-age solutions that can be helpful in solving the challenges.

II. PROBLEM STATEMENT

Modernized data centers have a huge dependency on complicated electrical along with the cooling systems that can be capable of working continuously without any failure. Even before the systems go live, they have to be well tested under full load conditions so as to confirm that they can effectively handle the real operating demands.

What are the aspects that the company needs to test?

- Backup generators and UPS systems
- Ventilation and cooling systems
- Power distribution systems
- Emergency power infrastructure

Challenges arise during testing:

At the time of the commissioning and construction, the installation of the actual server equipment is not fully there. Due to this, the testing of the systems is not properly done because of not having enough electrical demand available. Due to this, several challenges arise.

- Difficulty in creating full operating conditions
- Across different locations, there is a need for flexible testing.
- For HVAC testing, limited heat load is available.
- Challenges occur to test generators at proper capacity.

III. RELIABLE SOLUTION

To address this challenge, the company had to opt for load bank tests so that they could actually anticipate the real electrical demand that happens at the time of various activities. And this process includes maintenance and commissioning. Load banks usually allowed engineers to test the systems in a safe manner without having to depend upon the live IT equipment.



Figure 2: Reliable Load Bank Testing

Commissioning and system validation

Portable load banks are usually designated at the specified places throughout the data center rooms so that they can easily test

- Cooling systems
- Electrical panels and circuits were to be ensured they work properly before live deployment.
- UPS systems

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- Power distribution equipment
- Backup generators

Flexible testing for different environments

The companies required the flexible testing solutions that can effectively work in different climates and environments. This kind of flexibility allows the company to utilize similar testing methods all across multiple global data center sites.

The load bank systems were capable of supporting high-temperature locations.

- High-temperature locations
- DC load testing
- Portable testing applications
- Outdoor installations and more

Automatic testing and monitoring

To eliminate or minimize the manual work and to ensure that testing consistency across all facilities remains intact, a reliable software for controlling load banks was a go-to option. The system helped engineers to

- Review results in a more effective manner.
- Engineers could automate the recording of testing data.
- Monitor the performance in real time.
- Configure testing in a quick manner.

IV. PREPAREDNESS AND ONGOING TESTING

Once the data centers had come into operational condition, the company continued to perform the regular load testing to make sure that the backup systems remained ready and did not oversight at the time of the utility power system failure.

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Ongoing testing and maintenance activities get significant support with the help of permanent load bank systems. It incorporates:

- Permanent generator-mounted units
- Reactive and resistive load banks
- Combined load bank systems

V. OUTCOME

After the implementation of the load banking testing solutions, the company easily improved their hyperscale data center's reliability and got the trailblazing performance of the systems.

The organization successfully achieved:

- Better operational solutions
- Across all the facilities, they achieved consistent testing.
- More reliable backup power systems
- Cooling validation improvisation
- The commissioning process becomes faster.
- Infrastructure testing gets better.

VI. CONCLUSION

When it comes to the incredible performance and reliability of the modern data systems, load bank testing incredibly plays a significant role.

The Bottom line is:

- It helps companies to verify their cooling systems.
- And critical power operations work in a proper way at the time of the emergency situations.

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