Power Advisor

Electrical Health Report

Power Advisor Demo
Analysis Period: 2020-02-29 to 2020-03-06

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Site Information
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Report overview

Introduction

This report identifies issues in your electrical power system. These issues can affect the performance of your electrical system and your ability to correctly assess its state. Hidden electrical system issues can negatively impact your business operations.

The information in the report is intended for qualified personnel who are responsible for servicing and maintaining your electrical system. Use this information to correct the issues and improve the performance and availability of the system.

The report contains the following sections:

Analysis insights

This section shows high level summary information on the issues found. It includes an overall assessment score for the health of the electrical system.

Issue summary

This section has summary information on each issue type, including a list of possible causes and recommended actions.

Analysis details

This section provides device and measurement level details related to the identified issues.

Reference

This section includes definitions, a list of the issues found by device, and additional device or issue related information.

Note

The findings in this report are based on a Power Advisor analysis of your power management system data for the analysis period. The report was prepared by one of our power system experts as a part of your Power Advisor Digital Service Plan.
Introduction

This section provides high level summary information on the issues found by Power Advisor. It includes an overview of the type and priority of the issues and their overall impact on the electrical system health.

This section contains the following topics:

Overall score

This topic shows an overall assessment score for the health of the electrical system.

Identified issues

This topic lists the issues found in the system and their individual impact on the overall assessment score.

Tests passed without issues

This topic shows the Power Advisor tests your electrical system has passed without any identified issues.
Analysis insights

**Overall score**

The overall score is an assessment of the health of your electrical system. The score is a number between 100 % and 0 %. A system with few identified issues has a higher score; a system with many identified issues has a lower score. A perfect system score would be 100 %.

To determine the electrical health score, Power Advisor runs a number of tests on the power management system data. A failed test indicates a possible system issue and leads to a reduction of the overall score. The impact of a failed test on the score depends on the type of test, the type and size of load affected, and other weighting factors.

You can think of the overall score as a snapshot of the health of your electrical system based on the system status and the electrical network conditions during the analysis period.

<table>
<thead>
<tr>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>The median score shown in the following chart is calculated across all power management systems that have been analyzed by Power Advisor. It is shown as a benchmark to help you compare your overall score to that of other systems.</td>
</tr>
</tbody>
</table>
Analysis insights

Overall score (continued)

The chart below shows your overall score compared to the median score of all other systems:

Your overall score: 72 % - fair
Median score of all other systems: 66 % - fair

The chart below shows a breakdown of the issues that had the biggest negative impact on the overall score:

- Excessive Harmonic Distortion Condition
- Excessive Lagging Power Factor
- Transformer Overcapacity
- Voltage Imbalance Condition
- Under Voltage Condition
- Over Voltage Condition
Identified issues

To determine the electrical health, Power Advisor runs a number of tests on the power management system data. A failed test indicates a possible issue with the data, the device that collected the data, or the electrical network that is being monitored.

The following table shows the possible issues identified for your system. The table is sorted by impact of the issue on the overall score, with the highest impact issue at the top.

<table>
<thead>
<tr>
<th>Impact</th>
<th>Issue Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.86 %</td>
<td>Excessive Harmonic Distortion Condition</td>
</tr>
<tr>
<td></td>
<td>There are high levels of voltage total harmonic distortion (THDv) or current total harmonic distortion (THDi). Device affected: 3</td>
</tr>
<tr>
<td>11.63 %</td>
<td>Excessive Lagging Power Factor</td>
</tr>
<tr>
<td></td>
<td>There is a very low lagging power factor. Device affected: 1</td>
</tr>
<tr>
<td>3.44 %</td>
<td>Transformer Overcapacity</td>
</tr>
<tr>
<td></td>
<td>The peak load on the transformer is close to its rated capacity. Device affected: 1</td>
</tr>
<tr>
<td>0.53 %</td>
<td>Voltage Imbalance Condition</td>
</tr>
<tr>
<td></td>
<td>The voltage unbalance measurements fall outside of the recommended, standard defined limits. Device affected: 1</td>
</tr>
<tr>
<td>0.17 %</td>
<td>Under Voltage Condition</td>
</tr>
<tr>
<td></td>
<td>Some of the voltage measurements fall outside of the recommended, standard defined limits. Device affected: 1</td>
</tr>
<tr>
<td>0.07 %</td>
<td>Over Voltage Condition</td>
</tr>
<tr>
<td></td>
<td>Some of the voltage measurements fall outside of the recommended, standard defined limits. Device affected: 1</td>
</tr>
</tbody>
</table>

Tip: Click the issue title to get more information about that issue.

See Device details by issue for a list of devices affected by the different issues.

See Issues by device for a list of issues identified for each device.
Analysis insights

Tests passed without issues

To determine the electrical system health, Power Advisor runs a number of tests on the power management system data. The following table shows the tests your system has passed without finding any issues. The table is sorted alphabetically by test description.

Your system has passed none of the tests.
Issue summary

Introduction

This section provides summary information on each of the identified issues, including a list of possible causes and recommended actions. The list of issues is ordered by impact on the overall score, with the highest impact issue first.

Issues:

- Excessive Harmonic Distortion Condition  High priority
- Excessive Lagging Power Factor  High priority
- Transformer Overcapacity  High priority
- Voltage Imbalance Condition  High priority
- Under Voltage Condition
- Over Voltage Condition

Important Note

Electrical equipment and power management software and devices should be installed, operated, serviced and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material. A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and power management systems and has received safety training to recognize and avoid the hazards involved.
**Issue summary**

**Excessive Harmonic Distortion Condition**  

There are high levels of voltage total harmonic distortion (THDv) or current total harmonic distortion (THDi).

**Impact on overall score:** 11.86 %  
**Devices affected:** 3

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The loads include large motor drives, switching power supplies, or other loads with high total demand distortion.</td>
<td>Consider a power quality audit. An audit can find the source of the harmonics issues and can assess the need for an active filter solution.</td>
</tr>
<tr>
<td>The power supplied by the electric utility is distorted.</td>
<td>Consider a power quality audit. An audit can find the source of the harmonics issues and can assess the need for an active filter solution.</td>
</tr>
<tr>
<td>The transformers are overloaded and distort voltage and current waveforms.</td>
<td>Consider a power quality audit. An audit can find the source of the harmonics issues and can assess the need for an active filter solution.</td>
</tr>
</tbody>
</table>

**Possible Consequences**

Voltage and current harmonic distortion can cause intermittent tripping of motor drives and protective devices, overheating of transformers and conductors, electronic equipment failure, and higher energy losses.

See [details on the 3 devices](#) identified with this issue.  
Go back to [identified issues](#) for information on all identified issues in this analysis.
Excessive Lagging Power Factor

There is a very low lagging power factor.

Impact on overall score: **11.63 %**
Devices affected: 1

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The loads include large inductive loads, such as motors and transformers, or inductive loads that are used much below their design capacity.</td>
<td>Identify the loads that are causing the low power factor. Consider ways to improve the power factor, such as load optimization or the installation of power factor correction devices.</td>
</tr>
</tbody>
</table>

Possible Consequences

Significant lagging power factor can lead to power capacity issues for conductors and equipment, increased power losses, lower operating voltages, and power factor penalty charges by the utility.

See details on the device identified with this issue.

Go back to identified issues for information on all identified issues in this analysis.
## Transformer Overcapacity 🟠 **High priority**

The peak load on the transformer is close to its rated capacity.

Impact on overall score: **3.44 %**

Devices affected: 1

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The transformer is undersized.</td>
<td>Review circuit breaker, conductor, and transformer capacity for this bus. Evaluate harmonic distortion levels.</td>
</tr>
</tbody>
</table>

### Possible Consequences

- Increased power losses as a result of excess heating of components and equipment.
- Increased degradation on transformer winding insulation as a result of excess heating.
- Overheating and stressing of components and equipment.
- Equipment failure or reduced life expectancy.
- Increased harmonic distortion caused by a saturated power transformer core.
- Increased operational expenses and carbon footprint due to increased power losses.

See details on the device identified with this issue.

Go back to identified issues for information on all identified issues in this analysis.
**Issue summary**

**Voltage Imbalance Condition**  ![High priority]

The voltage unbalance measurements fall outside of the recommended, standard defined limits.

**Impact on overall score:** 0.53 %  
**Devices affected:** 1

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>There was a temporary voltage sag or swell on one of the phases.</td>
<td>Check for power quality incidents at the time of the voltage unbalance.</td>
</tr>
<tr>
<td>There are unbalanced phase currents supplying a large load.</td>
<td>Check for current unbalance. Consider rebalancing single phase loads supplied by the transformer.</td>
</tr>
<tr>
<td>The voltage supplied by the electric utility is unbalanced.</td>
<td>Check the supply voltage and contact the electric utility if necessary.</td>
</tr>
</tbody>
</table>

**Possible Consequences**

- Higher capital and maintenance costs due to increased equipment malfunction, wear and failure.
- Higher operational costs and a higher carbon footprint due to increased power losses.
- Difficulties when trying to synchronize the power system to alternative sources, for example closed transition transfer switching.

See [details on the device](#) identified with this issue.  
Go back to [identified issues](#) for information on all identified issues in this analysis.
Under Voltage Condition

Some of the voltage measurements fall outside of the recommended, standard defined limits.

Impact on overall score: **0.17 %**
Devices affected: 1

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The voltage supplied by the electric utility is low.</td>
<td>Check the supply voltage and contact the electric utility if necessary.</td>
</tr>
<tr>
<td>The voltage tap setting on the supply transformer causes the secondary</td>
<td>Check the tap settings on the transformer. Adjust the tap settings if possible.</td>
</tr>
<tr>
<td>voltage to exceed the lower range limit.</td>
<td></td>
</tr>
</tbody>
</table>

Possible Consequences

- Increased heating and stressing of components and equipment.
- Reduced life expectancy or equipment failure.
- Compromised equipment or system performance.
- Unexpected equipment trips and motor contactor dropouts leading to unplanned interruptions of facility operations.
- Decreased light output for some lighting types.
- Increased operating current and decreased starting torque, slip, speed, and efficiency in standard induction motors.
- Reduced effectiveness of power factor correction capacitors.

See details on the device identified with this issue.
Go back to identified issues for information on all identified issues in this analysis.
## Over Voltage Condition

Some of the voltage measurements fall outside of the recommended, standard defined limits.

**Impact on overall score:** **0.07 %**  
**Devices affected:** 1

<table>
<thead>
<tr>
<th>Possible Causes</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>The voltage supplied by the electric utility is high.</td>
<td>Check the supply voltage and contact the electric utility if necessary.</td>
</tr>
<tr>
<td>The voltage tap setting on the supply transformer causes the secondary voltage to exceed the upper range limit.</td>
<td>Check the tap settings on the transformer. Adjust the tap settings if possible.</td>
</tr>
</tbody>
</table>

### Possible Consequences

- Increased power losses as a result of excess heating of components and equipment.
- Increased wear on transformer winding insulation as a result of excess heating.
- Overheating and stressing of components and equipment
- Equipment failure or reduced life expectancy.
- Increased harmonic distortion caused by a saturated power transformer core.
- Increased operational expenses and carbon footprint due to increased power losses.

See details on the device identified with this issue.  
Go back to identified issues for information on all identified issues in this analysis.
Introduction

This section provides device and measurement level details related to the identified issues.

Important Note

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Device details by issue

This topic lists the different issues and the affected devices. The issues are shown in alphabetical order by issue name.

Excessive Harmonic Distortion Condition  ⚠️ High priority

Devices affected: 3

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV.Utility_Main</td>
<td>Impact: 7.16% ⚠️ Worst Measurements</td>
</tr>
<tr>
<td>LV_B.Main_Bkr</td>
<td>Impact: 3.84% Measurements</td>
</tr>
<tr>
<td>LV_E.Main_Bkr</td>
<td>Impact: 0.86% Measurements</td>
</tr>
</tbody>
</table>

Go back to Excessive Harmonic Distortion Condition for information on all identified issues in this analysis.

Measurements: MV.Utility_Main (9000)

Impact on overall score: 7.16% ⚠️ Worst

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold : above 3%

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand 3/4/2020 9:00:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>THD Voltage A-B mean</td>
<td>6.65%</td>
<td>5.93%</td>
<td>7.8%</td>
<td>7.56%</td>
</tr>
<tr>
<td>THD Voltage B-C mean</td>
<td>6.55%</td>
<td>5.9%</td>
<td>7.66%</td>
<td>7.55%</td>
</tr>
<tr>
<td>THD Voltage C-A mean</td>
<td>6.52%</td>
<td>5.93%</td>
<td>7.55%</td>
<td>7.36%</td>
</tr>
</tbody>
</table>

Note

Voltage was too high to propose an AccuSine Solution. Consider adding a meter capable of logging THDv and THDi in the Low Voltage section of your distribution system. Ask your Schneider Electric representative to build you a mitigation strategy.
Analysis details

Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued)  ⚠️ High priority

![Graph of MV.Utility_Main Excessive Harmonic Distortion Condition]

![Graph of MV.Utility_Main Excessive Harmonic Distortion Condition]
Excessive Harmonic Distortion Condition (continued)  ⚠️ High priority

The following chart shows a simulated voltage waveform with harmonic distortion. The waveform distortion shown is for THDv levels like those observed in your system. This is not an actual waveform captured in your system.
Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued)  ⚠️ High priority

The following chart shows a simulated current waveform with harmonic distortion. The waveform distortion shown is for THDi levels like those observed in your system. This is not an actual waveform captured in your system.

![Simulated current waveform with harmonic distortion](image)

Go back to [Excessive Harmonic Distortion Condition (Device details by issue)]

Measurements: LV_B.Main_Bkr (Micrologic X)

Impact on overall score: **3.84 %**

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold: above **3%**

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>THD Voltage A-B</td>
<td>8.03%</td>
<td>7.66%</td>
<td>8.34%</td>
<td>8.34%</td>
</tr>
<tr>
<td>THD Voltage B-C</td>
<td>7.97%</td>
<td>7.63%</td>
<td>8.26%</td>
<td>8.24%</td>
</tr>
<tr>
<td>THD Voltage C-A</td>
<td>7.93%</td>
<td>7.58%</td>
<td>8.18%</td>
<td>8.17%</td>
</tr>
</tbody>
</table>
Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued)

THD mitigation

Target THD of 5%:
Installing a Schneider Electric AccuSine PCS+ active harmonic filter with a capacity of 200 A with part number PCSP200D5N2 (UL Type 2) or PCSP200D5IP31 (IP31) can help resolve your harmonic distortion issue and is estimated to bring your THD I level below 1%. This solution is estimated to bring your Average Power Factor from 0.819 to 0.878 and decrease your monthly power factor penalty from $485 to $367.
Excessive Harmonic Distortion Condition (continued)  

![Graph of LV_B.Main_Bkr Excessive Harmonic Distortion Condition]

- **High priority**
Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued) 🔴 High priority

The following chart shows a simulated voltage waveform with harmonic distortion. The waveform distortion shown is for THDv levels like those observed in your system. This is not an actual waveform captured in your system.
Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued) ⚠️ High priority

The following chart shows a simulated current waveform with harmonic distortion. The waveform distortion shown is for THDi levels like those observed in your system. This is not an actual waveform captured in your system.

Go back to Excessive Harmonic Distortion Condition (Device details by issue)

Measurements: LV_E.Main_Bkr (Micrologic X)

Impact on overall score: 0.86 %

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold : above 3%

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand 3/3/2020 9:00:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>THD Voltage A-B</td>
<td>3.51%</td>
<td>2.91%</td>
<td>4.28%</td>
<td>4.15%</td>
</tr>
<tr>
<td>THD Voltage B-C</td>
<td>3.48%</td>
<td>2.9%</td>
<td>4.22%</td>
<td>4.11%</td>
</tr>
<tr>
<td>THD Voltage C-A</td>
<td>3.47%</td>
<td>2.9%</td>
<td>4.16%</td>
<td>4.06%</td>
</tr>
</tbody>
</table>
Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued)  

THD mitigation

Target THDi of 5%:
Installing a Schneider Electric AccuSine PCS+ active harmonic filter with a capacity of 60 A with part number PCSP060D5N2 (UL Type 2) or PCSP060D5IP31 (IP31) can help resolve your harmonic distortion issue and is estimated to bring your THD I level below 1%. This solution is estimated to bring your Average Power Factor from 0.837 to 0.955 and decrease your monthly power factor penalty from $183 to $173.
Analysis details

Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued)  ❗️ High priority

![Graph showing Excessive Harmonic Distortion Condition](image-url)
Analysis details

Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued) 🚨 **High priority**

The following chart shows a simulated voltage waveform with harmonic distortion. The waveform distortion shown is for THDv levels like those observed in your system. This is not an actual waveform captured in your system.
Analysis details

Device details by issue (continued)

Excessive Harmonic Distortion Condition (continued)  🚨 High priority

The following chart shows a simulated current waveform with harmonic distortion. The waveform distortion shown is for THDi levels like those observed in your system. This is not an actual waveform captured in your system.

Go back to Excessive Harmonic Distortion Condition [Device details by issue]
Analysis details

Device details by issue (continued)

Excessive Lagging Power Factor

Devices affected: 1

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>MV.Utility_Main</td>
<td>Impact: 11.63 % (Worst)</td>
</tr>
</tbody>
</table>

Go back to Excessive Lagging Power Factor
Go back to identified issues for information on all identified issues in this analysis.

Measurements: MV.Utility_Main (9000)

Impact on overall score: 11.63 % (Worst)

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold: below 0.9

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Factor Lagging Mean</td>
<td>0.85</td>
<td>0.8</td>
<td>0.9</td>
<td>0.87</td>
</tr>
</tbody>
</table>

Power Factor Penalty

No Power Factor Penalty information was provided. An estimate has been made based on a default calculation using the following rate: Base Utility - (Default) - Default Penalty Structure. Based on this calculation, your estimated monthly power factor penalty is $893. Contact your Power Advisor support representative with information from your Utility bill to change this calculation.

Information

The following devices are contributing the most to the low lagging Power Factor: LV_B.Panel_B1 (163 kVar), LV_B.Panel_B5 (82 kVar), LV_B.Panel_B3 (66 kVar).
Device details by issue (continued)

Excessive Lagging Power Factor (continued)  🟠 High priority

Solution Option 1: Power Factor Mitigation

700 kVar Solution:
Based on your Power and Power Factor, a Schneider Electric VarSet capacitor bank solution with a capacity of 700 kVar will improve your power factor at this metering point from 0.8540 to 1.0000. We estimate this solution will reduce your monthly Power Factor penalty from $893 to $0. Based on this information and an estimated installed cost of the solution of $38,500. The payback period for this solution would be 43.1 month(s). This solution is estimated to increase the available capacity at this metering point by at least 57 kVA and release up to 172 kVA. This can reduce the risk of overloaded equipment and can avoid capital expenses related to new transformers or other capacity upgrades. It would also save approximately 1 tons of CO2 (for the given period, based on your country average of 0.0590 kg of CO2 / kVArh).

600 kVar Solution:
Based on your Power and Power Factor, a Schneider Electric VarSet capacitor bank solution with a capacity of 600 kVar will improve your power factor at this metering point from 0.8540 to 1.0000. We estimate this solution will reduce your monthly Power Factor penalty from $893 to $0. Based on this information and an estimated installed cost of the solution of $33,000. The payback period for this solution would be 36.9 month(s). This solution is estimated to increase the available capacity at this metering point by at least 57 kVA and release up to 172 kVA. This can reduce the risk of overloaded equipment and can avoid capital expenses related to new transformers or other capacity upgrades. It would also save approximately 1 tons of CO2 (for the given period, based on your country average of 0.0590 kg of CO2 / kVArh).
Go back to Excessive Lagging Power Factor (Device details by issue)
Device details by issue (continued)

Over Voltage Condition

Devices affected: 1

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV_C.Main_Bkr</td>
<td>Impact: 0.07 %</td>
</tr>
<tr>
<td></td>
<td>Worst Measurements</td>
</tr>
</tbody>
</table>

Go back to Over Voltage Condition
Go back to identified issues for information on all identified issues in this analysis.

Measurements: LV_C.Main_Bkr (Micrologic X)

Impact on overall score: 0.07 %  Worst

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold: 10% above nominal

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand 3/3/2020 7:00:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage A-B</td>
<td>439.17V</td>
<td>433.12V</td>
<td>445.71V 11.43% above nominal</td>
<td>437.67V</td>
</tr>
<tr>
<td>Voltage A-N</td>
<td>253.86V</td>
<td>250.36V</td>
<td>257.63V 12.01% above nominal</td>
<td>252.99V</td>
</tr>
<tr>
<td>Voltage B-C</td>
<td>439.32V</td>
<td>433.98V</td>
<td>446.35V 11.59% above nominal</td>
<td>440.38V</td>
</tr>
<tr>
<td>Voltage B-N</td>
<td>253.94V</td>
<td>250.85V</td>
<td>258.01V 12.18% above nominal</td>
<td>254.56V</td>
</tr>
<tr>
<td>Voltage C-A</td>
<td>439.23V</td>
<td>433.84V</td>
<td>445.97V 11.49% above nominal</td>
<td>443.87V</td>
</tr>
<tr>
<td>Voltage C-N</td>
<td>253.89V</td>
<td>250.78V</td>
<td>257.79V 12.08% above nominal</td>
<td>256.57V</td>
</tr>
</tbody>
</table>
Device details by issue (continued)

Over Voltage Condition (continued)

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage L-L Avg</td>
<td>439.24V</td>
<td>434.72V</td>
<td>442.69V</td>
<td>440.64V</td>
</tr>
</tbody>
</table>

10.67% above nominal

![Voltage Chart](chart.png)
Device details by issue (continued)

Over Voltage Condition (continued)

Go back to Over Voltage Condition (Device details by issue)
Analysis details

Device details by issue (continued)

Transformer Overcapacity ⚠ High priority

Devices affected: 1

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>XFMR D</td>
<td>Impact: 3.44% Worst</td>
</tr>
</tbody>
</table>

Go back to Transformer Overcapacity
Go back to identified issues for information on all identified issues in this analysis.

Measurements: XFMR D (Transformer)

Impact on overall score: 3.44% Worst

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold: above 95% of nominal capacity

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand 3/3/2020 9:00:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Apparent Power</td>
<td>86.57kVA</td>
<td>13.62kVA</td>
<td>200.15kVA 125.1% of nominal capacity</td>
<td>197.31kVA</td>
</tr>
<tr>
<td>Demand Apparent Power</td>
<td>86.57kVA</td>
<td>13.62kVA</td>
<td>200.15kVA 125.1% of nominal capacity</td>
<td>197.31kVA</td>
</tr>
<tr>
<td>Demand Apparent Power</td>
<td>86.57kVA</td>
<td>13.62kVA</td>
<td>200.15kVA 125.1% of nominal capacity</td>
<td>197.31kVA</td>
</tr>
</tbody>
</table>
Analysis details

Device details by issue (continued)
Transformer Overcapacity (continued)  High priority

Go back to Transformer Overcapacity / Device details by issue
Device details by issue (continued)

Under Voltage Condition

Devices affected: 1

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV_D.Main_Bkr</td>
<td>Impact: 0.17 %</td>
</tr>
<tr>
<td></td>
<td>Worst Measurements</td>
</tr>
</tbody>
</table>

Go back to Under Voltage Condition
Go back to identified issues for information on all identified issues in this analysis.

Measurements: LV_D.Main_Bkr (Micrologic X)

Impact on overall score: 0.17 %

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold: 14% below nominal

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand 3/3/2020 9:00:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage C-A</td>
<td>335.41V</td>
<td>331.3V</td>
<td>340.56V</td>
<td>335.89V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16.96% below nominal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage C-N</td>
<td>193.88V</td>
<td>191.5V</td>
<td>196.85V</td>
<td>194.16V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16.52% below nominal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage L-L Avg</td>
<td>345.9V</td>
<td>342.33V</td>
<td>348.67V</td>
<td>346.45V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.15% below nominal</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Device details by issue (continued)

Under Voltage Condition (continued)

Go back to Under Voltage Condition (Device details by issue)
Device details by issue (continued)

Voltage Imbalance Condition ⚠ High priority

Devices affected: 1

<table>
<thead>
<tr>
<th>Device Name</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LV_D.Main_Bkr</td>
<td>Impact: 0.53 % Worst</td>
</tr>
</tbody>
</table>

Go back to Voltage Imbalance Condition
Go back to identified issues for information on all identified issues in this analysis.

Measurements: LV_D.Main_Bkr (Micrologic X)

Impact on overall score: 0.53 % Worst

The following table shows issue related measurement data for the device. Values outside the threshold are highlighted.

Threshold: above 2%

<table>
<thead>
<tr>
<th>Measurement Name</th>
<th>Average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>At Peak Demand 3/3/2020 9:00:00 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage Imbalance</td>
<td>3.03%</td>
<td>1.83%</td>
<td>4.5%</td>
<td>3.05%</td>
</tr>
</tbody>
</table>
Analysis details

Device details by issue (continued)

Voltage Imbalance Condition (continued)  ⚠️ High priority

![Graph of LV_D.Main_Bkr Voltage Imbalance Condition]

![Graph of NEMA Motor De-Rating for Voltage Imbalance]

Three phase NEMA motors should be derated by 21.33%.
Device details by issue (continued)

Voltage Imbalance Condition (continued) ⚠ High priority

![Motor Heating from Voltage Imbalance](chart.png)

Three phase motors will experience

40.10% excess heating from voltage imbalance.

Go back to [Voltage Imbalance Condition](#) [Device details by issue](#)
Reference

Introduction

This section includes definitions, a list of the issues found by device, and additional device or issue related information.

Issues by device ......................................................................................................................... 43
Issues marked as Informational ................................................................................................. 44
Glossary ....................................................................................................................................... 45
Issues by device

This topic lists the different devices and their associated issues.

The devices are sorted alphabetically by device name.

**LV_B.Main_Bkr**
- **Excessive Harmonic Distortion Condition** > Measurements

**LV_C.Main_Bkr**
- **Over Voltage Condition** > Measurements

**LV_D.Main_Bkr**
- **Under Voltage Condition** > Measurements
- **Voltage Imbalance Condition** > Measurements

**LV_E.Main_Bkr**
- **Excessive Harmonic Distortion Condition** > Measurements

**MV.Utility_Main**
- **Excessive Harmonic Distortion Condition** > Measurements
- **Excessive Lagging Power Factor** > Measurements

**XFM R D**
- **Transformer Overcapacity** > Measurements
Issues marked as Informational

This topic lists issues that were marked as 'Informational' by the power system expert who prepared this report. Issues marked as 'Informational' do not affect the overall assessment score for the electrical health of the system. No follow up actions are required for these issues.

No issues have been marked as informational for your system.
Glossary

This section includes definitions of terms or concepts used in this report.

High Priority Issue definition

High priority issues can have a high impact on the electrical power system for each instance. Non-high priority issues have a lower impact on the system for each instance. These issues gain importance if many instances are occurring.

Example:
*Transformer Overcapacity* is a high priority issue which needs to be investigated for each identified instance.

*Power Quality Metering Recommended* is a lower priority issue, which might be a concern depending on the number of instances and the importance of the affected equipment in the power system.

We recommend that you review and investigate all identified issues.

Worst score impact by a device for an issue

To determine the electrical health score, Power Advisor runs a number of tests on the power management system data provided by the monitoring devices.

A failed test for a device indicates a possible system issue and leads to a reduction of the overall score. The impact of a failed test on the score depends on the type of test, the type and size of load affected, and other weighting factors.

The device linked to the highest reduction of the score for an issue is marked as 'Worst'.


Disclaimer

The recommendations in this report are based on the information available to Power Advisor and may not consider other information that may be relevant to your situation. Please contact your Schneider Electric sales representative for a comprehensive evaluation.

Before you make any changes to the power monitoring system, make sure you have the proper training and follow all safety precautions.

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