



LOWERING YOUR RISK, RAISING YOUR RELIABILITY



The loss rate for electrical transformers is a perpetual concern among facility managers.

Equipment will fail for a variety of reasons, yet there are proven ways to significantly **reduce** or even **eliminate** many of these failures.

Identifying and removing conditions that cause or accelerate failure is **the key to successful reliability**. The following pages will lead you through a simple process of clarifying your risk exposure and how to respond in ways that ensure success.

To make the most of this tool, you may need to gather some technical information that is specific to your electrical system's configuration.

IDENTIFY YOUR CRITICAL TRANSFORMERS



Which of the transformers in your system are the **most critical**?

Here are a few questions to consider:

- Can the unit be easily and quickly replaced or repaired?
- How important is the power that is controlled by that unit?
- Is there an adequate spare unit readily available?

If you have a redundancy system in place, then any spare transformer you have may likely be considered a critical unit.



Is the power output of the critical transformer **sufficient** for the load or application?

Your transformer should be rated to **exceed** the peak loads of your system or application. Overloading the transformer will cause premature aging due to excess heat and stress.



DETERMINE THE TRANSFORMER'S CONDITION

GREAT GOOD FAIR POOR

What is the **current condition** of your transformer?

It's much easier to recognize a transformer in bad condition leaking gaskets, inoperable gauges, excess gassing or moisture as indicated on test reports — but what if the problems aren't so noticeable? What if you could actually prevent problems before they show up?

> Nearly 30% of today's transformers have aged prematurely. In 70% of those cases, no corrective action has been taken.



Determine the extent of the **consequences** or the impact of an unplanned power outage.

There are many factors to consider. It is easy to underestimate the impact of an event on your operation. For instance, replacing a transformer without an available spare or without matching connections could be quite costly and time consuming. Take the time to project possible outcomes to avoid being inadequately prepared.

NEGLIGIBLE

Little to no financial loss Minimal downtime No damage to facility No threat of personal injury No environmental impact

MARGINAL

Little to some financial loss Temporary downtime Some damage to facility Moderate threat of personal injury Minimal environmental impact

MAJOR

Substantial financial loss Lengthy downtime Severe damage to facility Major threat of personal injury Significant environmental impact

SEVERE

Extensive financial loss Prolonged downtime Total loss of facility Serious personal injury or death Severe environmental impact



Determine your existing **probability of** transformer failure.

A major factor in determining the likelihood of failure is, of course, the condition of the transformer itself. The worse the condition, the more likely a problem will arise.

Another significant ingredient is the approach you take in maintaining your equipment. Reacting to problems after they occur is radically different than anticipating problems and planning accordingly.

Select a category that best reflects your existing probability of failure.

VERY LIKELY	Poor transformer condition Little to no detection methods in place Reactive maintenance only
LIKELY	Fair transformer condition Limited or inadequate detection methods in place Mostly reactive (and some preventive) maintenance
SOMEWHAT LIKELY	Good transformer condition Basic detection methods in place Adequate preventive maintenance practices
UNLIKELY	Advanced detection methods in place Preventive and predictive maintenance practices



Determine your existing **risk factor**.

Consider this reliability matrix. The level of risk is determined at the intersection of **consequence** and **probability** of failure.





COMPREHENSIVE DETECTION METHODS

- □ Visual inspection of the equipment
- Infrared (IR) scanning at the time of oil sampling or at regular intervals
- Complete annual oil testing
- □ Online DGA monitoring
- Condition diagnosis along with maintenance recommendations
- Periodic electrical testing

Begin to implement more **comprehensive methods of detection**.

The use of several comprehensive detection methods can reduce the probability of failure by providing a thorough and more accurate evaluation of your transformer's condition.

IMPLEMENT PREVENTIVE AND PREDICTIVE ACTIONS

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- Timely removal of damaging compounds through oil processing
- Repair or replacement of gaskets, inoperative gauges, loose lead connections and other issues of physical noncompliance

Implement more aggressive practices in your **preventive and predictive maintenance** program.

Be proactive in following recommended maintenance procedures. This is one of the most cost-effective and timely practices for failure prevention.

Perform regular preventive maintenance on your transformer. This ensures its optimal health and performance and extends its reliability.

ten lower your probability of failure

DETECTION AND ACTIONS Adjust (yes, lower) the **likelihood** of your transformer experiencing failure!

Take the time and effort to...

- improve detection methods,
- take corrective **actions**, and implement preventive maintenance **practices**.

YOU'RE ON YOUR WAY TO LOWERING YOUR RISK!

Electrical system **reliability** is crucial to your operation.

Identify your potential vulnerabilities and take purposeful action to mitigate them.

And this is exactly where SDMyers can help you.

We offer you more than **50 years of expertise** in transformer reliability. Our industry-leading maintenance programs have played a major role in securing electrical reliability for hundreds of companies worldwide.

Knowledge and action ... there's just no substitute for that!

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