

All electrical systems experience undesired incidents. While the occasional trip may not be a major problem, repeated tripping or equipment failure often entails large costs due to repeated or lengthy production stops. Simply restarting the process or replacing the faulty component may therefore not be an acceptable solution; repeated tripping should be expected to continue or the replaced equipment may fail again.

In order to avoid future problems and thereby reduce costs due to undesired and unplanned production stops, the root cause of the problem should be sought out. The process is called **Root Cause Analysis**.

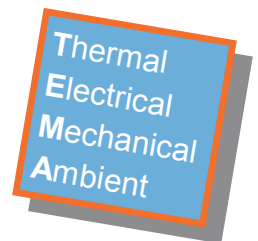
Root Cause Analysis is an in-depth analysis that aims to find the root cause of a problem or an incident. A root cause is a major cause of the problem or incident for which there is no significant deeper cause and which, if corrected, will prevent the problem or incident in the future.

Several methods for root cause analyses, quality improvement and problem solving exist. With respect to

root cause analyses, they typically have these steps in common:

- Gather data and information from event logs, protection devices, operators, eye witnesses, site inspections, measurements and equipment investigations (“forensics”)
- Analyze information and define hypotheses for the root cause
- Check hypotheses (verify or falsify)
- Draw conclusions

Depending on the nature of the problem, a root cause analysis may require participation of specialists in many fields: Electrical, mechanical, materials, process, operations and more.



Unitech Power Systems has experience from numerous incident investigations. In case of repeated (nuisance) tripping problems, Unitech Power Systems normally has the necessary in-house expertise to find the root cause. In case of equipment failure, additional expertise is often required, and Unitech Power Systems will then facilitate and lead the root cause analysis process or take part in the root cause analysis team, depending on the client’s needs and wishes.

In many cases, a root cause analysis can be made easier if a **Failure Mode Effect Analysis** for the equipment or system exists. FMEA is a systematic approach to the identification of potential failure modes, their causes and effects. If the FMEA is extended to cover criticality as well, **Failure Mode Effect and Criticality Analysis**, it becomes an effective part of a risk analysis and risk mitigation program. FMEA, FMECA and risk analyses are services that are offered by Unitech Power Systems and carried out for clients on a regular basis.

Contact us for more information and to discuss how we can serve your needs.

Contact person:

Arild Larsen  
Sales and Marketing Manager  
E-mail: [larsen@unitech.no](mailto:larsen@unitech.no)  
Phone: +47 932 26 425



### Business area overview



### Selected project references

**Year: 2014**

**Customer: BP**

#### Transformer failure

Measurements and analyses of switching over voltages

Demonstration (verification) of failure cause through computer simulations

Analyses of proposed mitigation methods

**Year: 2013-2014**

**Customer: ABB**

#### High voltage motor failure

Participation in root cause analysis (RCA) team with plant operator and motor vendor

Measurement and analysis of variable speed drive, high voltage motor voltage and current wave forms

**Year: 2012-2013**

**Customer: BP**

#### Zero sequence source investigations

Identification of reason for over heating of generator Neutral Earthing Resistor

Identification of source for zero sequence currents in cables

**Year: 2015**

**Customer: FMC Technologies**

#### Actuator power supply failure

Participation in root cause analysis (RCA) team