

# Equipment for usage at temporary voltages > 420 kV

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# Case

- **NC RfG**
  - Requires the capability of high voltage equipment to be operated at temporary voltages > 420 kV (CE: 20 – 60 minutes)
- **System users concerns**
  - Temporary operation > 420 kV of equipment with a rated voltage of 420 kV is outside the relevant IEC specifications
  - Does NC RfG thus require system users to use (more expensive) equipment with a rated voltage of 550 kV (which is the next higher equipment class as defined by the relevant IEC standards)?

# Assessment

- **NC RfG**
  - defines technical capabilities of power generating modules and associated equipment
  - technical capabilities are relevant for plant and equipment design
  - **However:** NC RfG does not define comprehensive and exhaustive plant or equipment specifications
- **Responsibilities for functioning of plant and equipment**
  - each system user is responsible for proper functioning of its own plant and equipment
  - each system user shall specify its plant and equipment on the precondition that the technical capabilities as defined by NC RfG are met
  - system users may rely on plant / equipment standards (e.g. IEC), but compliance with these standards is not required by NC RfG
  - System users have to ensure that their power generating module complies with the requirements of the RfG
  - system operator shall assess the compliance of an equipment/ a unit with the requirements applicable under NC RfG, e.g. by requesting a declaration of compliance from the system user
- **Assessment**
  - If the technical capability as required by NC RfG is covered by a equipment standard and the manufacturer warrants that the equipment complies with the standards, the equipment user would still remain responsible against the system operator, but could typically pass on responsibility/liability for malfunction of the equipment to the manufacturer (as long as the equipment was operated within the design limits).
  - If the technical capability as required by NC RfG is **not** covered by a equipment standard, the manufacturer would typically not warrant the proper functioning, if the equipment was tested only under conditions defined by standards. Nonetheless, the system user may still require the manufacturer to carry out tests beyond the conditions defined by standards to demonstrate RfG compliance. Otherwise the system user typically could not pass on responsibility/liability to the manufacturer.
  - It is a risk assessment decision of the user, which equipment to use.

# Conclusion

- **Conclusions**
  - NC RfG does not define specifications and prescribe which equipment to use.
  - NC RfG does not release the equipment owner from the risk assessment and associated responsibilities/liabilities.
  - The equipment owner shall require the manufacturer to declare RfG compliance (e.g. demonstrated by tests, even if such tests are not covered by standards)

# Thank you for your attention!

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