Standard IEC 60034 on Rotating electrical machines

The IEC 60034-1 and IEC 60034-3 do not provide for operation in extreme ranges of both frequency and voltage, as we can see on the figure below.

IEC 60034-3 specifies that:

“In practical applications and operating conditions, a machine will sometimes be required to operate outside the perimeter of zone A. Such excursions should be limited in value, duration and frequency of occurrence. Corrective measures should be taken, where practical, within a reasonable time, for example, a reduction in output. Such action may avoid a reduction in machine life from temperature effects.”

“The temperature-rise limits or temperature limits in accordance with this standard apply at the rating point and may be progressively exceeded as the operating point moves away from the rating point. For conditions at the extreme boundaries of zone A, the temperature rises and temperatures typically exceed the limits specified in this standard by approximately 10 K.”

Standard IEC 60601 on medical electrical equipment

Current requirements for some critical consumer groups. The IEC 60601:2005 standard imposes for medical equipment a frequency range of +/− 1 Hz. The specification to allow abnormal frequencies during 30 min or more would mean new, stricter requirements for medical equipment. See extract of the standard IEC60601. It should be ensured that requirements do not lead to problems or undue costs for sensitive devices such as medical equipment, equipment used in air traffic control and telecommunications.
4.10.2 Supply mains for ME equipment and ME systems

For ME equipment intended to be connected to SUPPLY MAINS, the following RATED voltages shall not be exceeded:

- 250 V for hand-held ME equipment;
- 250 V d.c. or single-phase a.c. or 500 V polyphase a.c. for ME equipment and ME systems with a RATED input ≤ 4 kVA; or
- 500 V for all other ME equipment and ME systems.

Supply mains in this standard shall be assumed to have the following characteristics:

- overvoltage category II for mains transients unless a higher category is specified by the MANUFACTURER;
- no voltage in excess of 110 % or lower than 90 % of the NOMINAL voltage between any of the conductors of the system or between any of these conductors and earth (see 7.9.3.1);
  
  NOTE 1 IEC 60601-1-2 contains requirements and tests for voltage dips, short interruptions and voltage variations on the SUPPLY MAINS. See also 1.3.
- voltages that are practically sinusoidal and forming a practically symmetrical supply system in case of polyphase supply;
- a frequency of ≤ 1 kHz;
- a frequency deviation of ≤ 1 Hz from the NOMINAL frequency up to 100 Hz and ≤ 1 % from the NOMINAL frequency from 100 Hz to 1 kHz;
- the protective measures as described in IEC 60364-4-41;
  
  NOTE 2 If ME equipment or an ME system is intended to be operated from a SUPPLY MAINS with characteristics different from the SUPPLY MAINS described in this subclause, additional safety measures could be necessary.
- a d.c. voltage (as measured by a moving coil meter or equivalent method) having a peak-to-peak ripple not exceeding 10 % of the average value.

Where peak-to-peak ripple exceeds 10 % of the average value, the peak voltage has to be applied.