Failure cause of ZNR

- **Excessive surge current**
  - **Mechanical failure**
  - **Lightning current**
    - (Open mode) ~ Relatively large excessive surge
    - (Short mode) ~ Relatively small excessive surge

- **Surge invasion more than rated**
  - **Large through-hole**
  - **Open and closing of large capacity load**
    - (Excessive surge energy)
    - (Short mode)

- **Pulse power over**
  - **Large through-hole**
  - **Multiple pulses in a short period of time**
    - (Short mode)

- **Allowable circuit voltage over**
  - **Large through-hole**
  - **Abnormal voltage rise**
    - (Overvoltage applied, single-line-to-ground fault, etc)
    - (Short mode)

- **Environmental factors**
  - **Ambient temperature**
  - **High-temperature use**
    - **Overheat**
      - (Short mode)

- **ZNR failure**

**Countermeasure**

- Measures in fuses or earth leakage circuit breaker, etc.
- Change of use conditions