HITACHI
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# Harmonics in power systems: origin, analysis and filtering solutions

## OBJECTIVE

- Discover all steps within a holistic harmonics study, from filtering solutions and dimensioning to field implementation.
- Understand the importance of power quality parameters to achieve an efficient utilisation of electrical stations.

## AUDIENCE

Engineers and technicians interested in the quality of energy, involved in harmonics problems solving.

## CONTENT

**Fundamentals of harmonics**
- Origin and definitions
- Linear and non-linear loads
- Harmonic distortion factor
- Harmonic power
- Harmonics and sequence components
- Series and paralell resonance
- Ferro-resonance

**Legal background and IEC 61000 norm**

**Harmonic sources**
- Harmonic generation mechanisms
- Elements generating harmonics
- Non-controlled and controlled rectifiers
- Inverters
- Equipment
- Total harmonic factor in equipment
- Harmonics effects

**Harmonic filtering solutions**
- Frequency response
- Reactive power compensation
- Passive filters
- Active filters

**Fundamentals of filtering design and dimensioning**
- Preliminary required information
- Procedures
- Dimensioning
- Case studies

**Measurements, analysis and diagnostics**
- Preliminary observation of possible evidence
- Harmonics measurement
- Software for harmonics analysis
- Data analytics
- Diagnosis
- Case studies

**Capacitors and protection systems**
- Technologies
- Filter protection
- Construction and installation
- Assembly and commissioning
- Maintenance
- Case studies

**LIVE ONLINE TRAINING**
**Duration**: 18 hours
**More information and registration here:**
https://bit.ly/HitachiGridAcademy

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