

Resurrection of IEEE 422
“IEEE Guide for the Design
and
Installation of Cable Systems
in
Power Generating Stations”

Proposed Title

IEEE Guide for the Application
Engineering and Design of Cable and
Raceway in Electric
Power Generating Stations

(Probably will require a different IEEE Std.
number)

History

- IEEE 422 approved in 1986
- Reaffirmation ballot in 1992
- Unresolved negative ballot and not submitted to IEEE Standards Board
- Withdrawn 1994

Working Group

- Joint sponsors – Power Generation Committee (ED&PGC) and ICC
- 10 WG members – seeking volunteers
- First WG meeting 11/6, 2:00 – 3:15 pm
- Start ballot ~ Spring 2010

Scope of Guide

- Generating Stations
- Application Engineering of Cable
- Relationship to IEEE 690 (approved 2004)
- Overlap with IEEE 666 (approved 2007);
Clause 12.3 “insulated cable”
- Coordination with IEEE 525 (tentative approval 2007)

NOT Included in the Guide

- NOT Safety Related Nuclear Class 1E
- NOT cable fabrication, installation, or testing
- NOT substations, HVDC, SVC, etc.

Cable Applications

- Power cables –
 - low voltage: $<1,000\text{ V}$
 - medium voltage: $1\text{ kV} - 35\text{ kV}$
- Cables for station
 - control
 - indication, instrumentation, metering
 - Protection
 - Network cable

Cable Constructions

- Power
 - Solid dielectric
 - Jacketed
 - Low voltage-no shield, medium voltage-shielded

Cable Constructions

- Control, indication, metering, etc.
 - Copper conductor, multiple conductor, and twisted pair
 - Single pass and jacketed
 - Shielded and unshielded
 - Coaxial
 - Fiber optic

Raceway Types

- Above & below grade
- Conduit and cable tray
- Cable spreading areas and cable tunnels

Raceway Constructions

- Metal – steel and aluminum
- Non-metal
- Direct buried
- UG buried duct
- Concrete encased – no reinforcement and steel reinforcement

Areas Considered

- Ampacity - power cable
- Circuit voltage drop – power & control
- Radiated and conducted EMI
- Installation environment
- Electrical segregation
- physical separation
- Equipment failure-missiles
- Fire related

Engineering and Design Process

- Methods of analysis of alternates, e.g. heat transfer
- Design bases, e.g. ambient temperature
- Design criteria, e.g. expected load current less than cable ampacity