

**AN UPDATE ON
IEC TC 81
(LIGHTNING PROTECTION)**

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IEC 62305 – PROTECTION AGAINST LIGHTNING

- Part 1 – General Principles
- Part 2 – Risk Management
- Part 3 – Physical Damage to Structures and Life Hazard
- Part 4 – Electrical and Electronic Systems within Structures
- Edition 1 – January 2006
- Revision – 2010
- Revision requires new data or findings

PART 1 REVISIONS

- German proposal for new lightning threat definition to address inductive coupling affects (1/500)
- Reflective of CIGRE data on negative 1st short strokes
- Applicable only for risk assessment to determine surge values on incoming cable (cable ducts, etc)

PART 3 – TALL STRUCTURES

- 5.2.3 – Flashes to the side of tall structures
- Existing text requires air termination on upper 20% same as roof for structures > 60 m
- Discussed revision during March 2007 MT8 meeting to address US concerns

TALL STRUCTURES REVISION

- Reduce requirements to LPL IV on flat areas
- Encourage strike termination devices on corners, edges, and protrusions
- Satisfied by external metallic materials such as curtain wall supports, metal cladding, etc.
- May be < 1 mm if puncture, hot spots, or ignition not an issue

VERTICAL VS. HORIZONTAL EARTHING ELECTRODES

- 5.4.2.1 requires minimum length of horizontal earth electrode twice that of vertical
- NFPA 780, 4.13 requires 8-foot vertical and 12-foot horizontal
- Literature can be found to support both policies
- Task Force agreed to focus on review of test data

EARTH ELECTRODE LENGTH

- Preliminary review of data shows strong dependence on ρ
- Too soon to see if there are other factors to consider (moisture, etc)
- March 2007 meeting MT8 directed that the Task Force also consider transient and high frequency impedance

STRUCTURES WITH RISK OF EXPLOSION

- Most significant proposal is to move the requirements to the body of the document or make it a Normative Annex
- Covers scopes in NFPA 780, Chapter 7 and Annex K
- Attempt to harmonize standards from participating nations

PART 3 ANNEX E

- Maintenance and Inspection Guidelines
- Tasked to reduce the size of the annex
- Currently similar to NFPA 780 Annex A and Annex D
- Simplify annex to facilitate its use by LPS designer and installer

PROTECTION OF HUMANS

- Address issues associated with probability of shock due to step and touch voltages
- May result in New Work Proposal to develop a Technical Report to cover subject
- 62305-3, Clause 8 and 62305-2 Annex B relevant to effort

K_C EVALUATION

- Factor to take into consideration current sharing among conductors
- Relevant to evaluation of separation distance (bonding)
- Longitudinal voltages of concern
- Consider only dc of interest and adjacent conductors (95%)
- Studies underway in Austria and Germany

MATERIAL TOLERANCES

- Table 6 allows 10% tolerance for \emptyset of air terminals and conductors
- CENELEC suggests 3% tolerance
- US TAG suggested minimum with no tolerance
- Issue of measurement accuracy
- What is UL criteria?
- Need help ASAP

RISK MANAGEMENT

- Simplified software limitations
- Effort to align software to standard will limit its use to only simple structures
- Stress software is only a tool to help one understand the process provided in the standard
- To be addressed in detail Sept 2007

N_D EVALUATION

- Put upper limit on size of collection area
- Very tall structures can lead to collection area of km^2s
- Cap effective height at 90 m
- Does not address upward streamers
- Possible alternative is to change factor based on range of height

LOSS FACTOR VALUES

- Germany conducted statistical analysis of 74,000 insurance claims
- Compare claim with ground strike data to exclude direct strikes and false claims
- Looking for data to improve evaluation of loss of internal systems
- Found some correlation between losses and size of induction loop

LIFE HAZARD RISK COMPONENTS

- Australia has added 2 new loss factors to cover telecom / use of electronic equipment
- Must change assumption that there is no risk to people inside a structure
- TBD peak current value to use for loss of life or permanent disability and exposure time

SURGE RATING OF SPDS

- Existing current division assumption not characteristic of experience
- Need clearer distinction between SPDs used for potential equalization and SPDs for protection of equipment
- Tie each to source of damage?
- MT3 to investigate