

Special Publication: “Practical Aspects of Ferroresonance”

IEEE PES Summer Meeting

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Proposed Structure:

- Foreward / Executive Summary
- Introduction
 - What is Ferroresonance and how does it impact us?
 - Transformer core structure & equivalent circuit models
 - Typical waveforms and overvoltages (maybe just for single phase)
 - Nonlinear behavior, bifurcations, problematic to generalize or predict
- Detailed Summary / Literature Search
 - History, major milestones, contributors to knowledge.
 - Breakdown by Category (match sequence, structure of next section)
 - Basic Mitigation Techniques (case-by-case details in next section)
- Catalog of Ferroresonance Scenarios and Mitigation
 - Distribution systems
 - Subtransmission Systems
 - Transmission Systems
 - Manifestation of ferroresonance on customer side of meter
 - Special Cases involving instrument transformers, industrial applications.
 - Engineering Forensics, identifying ferroresonance, symptoms, damage.
- Things that are NOT Ferroresonance
 - Cigre TOV summary
 - Voltage Magnification (capacitor bank switching)
 - Sustained harmonic inrush (Roger D mentioned 4th harmonic case).
 - Clearing of T-Line, linear resonance with reactor.
 - Misinformation in the literature
- Introduction to Modeling, Simulation, Parameters
 - Basic orientation and introduction for the novice
 - Refer to TP-133-0, “Modeling & Analysis of System Transients”
 - Brief discussion of simulation tools available, level of knowledge required
 - Parameters required
 - Goal : Provide basics, make them knowledgeable enough to a) continue on to more advanced references, or b) know when and where to seek help.
- Conclusions
 - General Recommendations
 - Preferred connections and operating strategies
 - How to avoid and/or mitigate
 - Design tradeoffs: cost vs. immunity
 - Closure
- Appendices