

Existing Organization of C57.163 - 2015

Contents

1. Overview
 - 1.1 Scope
 - 1.2 Word usage
 2. Normative references
 3. Definitions, acronyms, and abbreviations
 4. Background
 5. Effects of GIC on power transformers
 - 5.1 Basics of the effects of dc on power transformers
 - 5.2 Additional var demand and current harmonics associated with GIC
 - 5.3 Thermal effects of GIC
 - 5.4 Other effects of GIC in transformers
 6. Thermal response of transformers to GIC
 - 6.1 Thermal effects of dc current
 - 6.2 Typical signature/profile of GIC
 - 6.3 The effect of the short duration of GIC pulses on transformer temperatures
 - 6.4 Procedure for calculation of thermal response of windings and structural parts to a GIC profile
 - 6.5 Example of calculation of thermal performance to a typical GIC profile
 7. GIC capability of a transformer design
 - 7.1 GIC magnetic capability
 - 7.2 GIC thermal capability
 8. Evaluation of susceptibility of existing fleet of transformers to effects of GIC
 - 8.1 Design-based susceptibility
 - 8.2 GIC level-based susceptibility
 - 8.3 Total GIC susceptibility
 9. Specifications
 - 9.1 GIC signature
 - 9.2 Recommended temperature limits
 - 9.3 Recommended design review requirements
 - 9.4 Testing
 10. Transformer GIC monitoring
 - 10.1 Monitoring
 - 10.2 Predicting part-cycle core saturation
- Annex A (informative) Bibliography

Summary of proposed organizational changes:

1. Move Clause 6.2 *Typical signature/profile of GIC* to Clause 4 *Background*.
2. Move definition of effective GIC from Clause 7.1 to Clause 4 *Background*
3. Rename Clause 5.2 to *Magnetic effects of GIC*
4. Create new clause, *Magnetic Response of Transformers to GIC*, which is similar in structure to existing Clause 6 *Thermal Response of Transformers to GIC*
5. Incorporate information from Clause 7 (GIC magnetic and thermal capability) into the respective magnetic and thermal response clauses

Proposed Reorganization of C57.163 - 2015

Note: All proposed modifications/additions are not shown.

(changes shown in red)

Contents

1. Overview
 - 1.1 Scope
 - 1.2 Word usage
 2. Normative references
 3. Definitions, acronyms, and abbreviations
 4. Background
 - 4.1 Geomagnetic Disturbances
 - 4.2 Typical signature/profile of GIC
 - 4.3 Effective GIC in Autotransformers
 5. Effects of GIC on power transformers
 - 5.1 Basics of the effects of dc on power transformers
 - 5.2 Magnetic effects of GIC
 - 5.3 Thermal effects of GIC
 - 5.4 Other effects of GIC in transformers
 6. Magnetic response of transformers to GIC
 - 6.1 Magnetic effects of dc current
 - 6.2 GIC magnetic capability (from original Clause 7)
 7. Thermal response of transformers to GIC
 - 7.1 Thermal effects of dc current
 - 7.2 GIC thermal capability (from original Clause 7)
 - 7.3 The effect of the short duration of GIC pulses on transformer temperatures
 - 7.4 Procedure for calculation of thermal response of windings and structural parts to a GIC profile
 - 7.5 Example of calculation of thermal performance to a typical GIC profile
 8. Evaluation of susceptibility of existing fleet of transformers to effects of GIC
 - 8.1 Design-based susceptibility
 - 8.2 GIC level-based susceptibility
 - 8.3 Total GIC susceptibility
 9. Specifications
 - 9.1 GIC signature
 - 9.2 Recommended temperature limits
 - 9.3 Recommended design review requirements
 - 9.4 Testing
 10. Transformer GIC monitoring
 - 10.1 Monitoring
 - 10.2 Predicting part-cycle core saturation
- Annex A (informative) Bibliography