Life Cycle Management of Station Equipment and Apparatus Interest Group

The electricity industry is undergoing fundamental change in moving from a regulated monopoly to a competitive industry. Low load growth, over-capacity and uncertainty about the future shape of the industry are creating pressures on the availability of capital and the reduction of operating costs.

Now more than ever, there is a need to optimize the use of existing station plant assets and to develop new, lower cost, more efficient and reliable equipment applications. This new reality is complicated by the fact that a significant amount of station equipment in use today has already accumulated between 20 to 40 years of service. Maintenance costs will rise as the inherent reliability of aging plants starts an inevitable decline.

The objective of this Interest Group is to bring together interested parties to facilitate research that will optimize the life cycle management of station equipment and apparatus and reduce costs through collaboration of methods, procedures, and practices.

Topics & Issues

Operational Optimization

- On-line Equipment Condition Monitoring to Aid in Predicting Pending In-Service Failures
- Equipment Diagnostics and Maintenance
- Equipment Condition Assessment
- Seek Out, Assess and Implement New Monitoring Technologies.
- Establish "Best Practices" from the Group Expertise

Life Optimization

- Insulation Aging/Deterioration Control
- Validating Tools for Predicting Remaining Life
- Validating Tools for Life Extension of Equipment
- Safety & Environment Preoccupations

Technology Coordinator

Mr. Jack Shaver, P. Eng. leads the Life Cycle Management of Station Equipment and Apparatus (LCMSEA) Interest Group. Mr. Shaver has over 30 years of engineering experience with Manitoba Hydro in positions ranging from distribution design to apparatus maintenance. In his latest position as Senior Apparatus Maintenance Engineer, he was responsible for developing maintenance standards for substation equipment based on Reliability Centered Maintenance (RCM) in Transmission and Distribution Substations. A graduate of the University of Manitoba, he served as member and Chair of the Manitoba Hydro Professional Engineers Association Safety Committee and was Manitoba Hydro's representative to LCMSEA from 1996 until his retirement in 2003.

Projects

for a complete project listing, please visit: www.ceati.com/lcmsea

- Transformers: An In-Service Guide for New and Used Transformers
- Circuit Breaker/Switchgear Specification Guides
- Condition Assessment, Safety Improvement and Life Extension for Metalclad Switchgear
- Instrument Transformers: Specification Guide Including a Summary of Key Standards and Guides
- Risk Level Assessment for Operating, Maintenance and Capital Funding Expenditures
- Total Ownership Cost Review
- Gas Insulated Substation Seminar
- Substation Equipment Condition Parameters
- Optimal Life Cycle Management for Transformers: A Financial/Risk Model
- Maintenance Strategies
- Contingency Planning Criteria: On-Site or Off-Site Spare Equipment, Mobile Transformers, Etc.
- Review and Summary of Key Standards and Guides for Power Switchgear
- Power Transformer Specification Guide
- Substation Equipment Asset Health Index
- Development of a Predictive Analysis Program for Evaluating the Success of Reclamation of Mineral Based Transformer Oils
- Power Circuit Breaker Reference Document
- Substation Ground Grids – Additions and Modifications
- Fuseless Capacitor Dielectric Testing
- Transformer Failure Modes: Causes, Detection and Monitoring - An Information Guide
- Gasket Specifications – Best Practices for Leak Prevention
- Breaker Failure Modes: Causes, Detection and Monitoring
- Condition Based Risk Management (CBRM), A Process to Link Engineering Knowledge and Practical Experience to Investment Planning
- Methanol: A New Marker for Paper Ageing
- Evaluation of Substation and Microwave/ Communication Site Battery Backup Options
- SF6 Gas Handling and Control
- Ethylene Production in Power Transformers
- Optimal Management of Aging Substation Assets: Lifecycle Costs and Repair/Replace Strategies
- Transformer Repair Facilities and Capabilities
- Ground Grid Corrosion
- Review of Passive and Active Noise Mitigation Technologies for Substation Transformers
- Electrical Protection of Telephone Cables Serving Substations
- Short-Circuit Design Requirements for Power Transformers
- SF6 By-Products – Safety and Clean-up
- Review and Summary of Key Standards and Guides for Station-Class Transformers
- Survey Existing Wireless Hardware, Software Technologies for Power Transmission Utilities
- Overview of Statistical Methods, Models and Analysis for Predicting Equipment End of Life
- Optimized Battery and Charger Condition Assessment and Life Extension
- End of Life Decision Support Model for Transformer Load Tapchangers
- Health and Risk Index Tool for Transformers and LTCs
- Vibro-Acoustical Condition Assessment and Condition Analysis of LTCs
- Luminol Oil Aging Evaluation
- High Voltage Disconnect Switch Asset Management - Information Requirements
- Power Apparatus Bushing Condition Assessment and Diagnostics
- Identifying and Documenting Existing Electromagnetic Interference (EMI) Detectors that Forecast Insulation Breakdowns in Substations
- Survey of Existing Multi-Criteria Substation Equipment Asset Management Methods
- Identifying and Documenting Existing Substation Ground Grid Detectors
- Online-Offline Techniques to Assess the Need to Replace CB Contacts for Circuit Breakers
- MV and HV Air Break Disconnect Switch Arc Reach Study
- Prediction of Remaining Life of Power Connectors and Disconnect Switches
- Improved Condition Assessment and Diagnosis of CB and LTC by Particle and Sediment Analysis
- Instrument Transformer Condition Assessment and Diagnostics
- Transformer Stations - Oil Containment, Spill Prevention and Spill Management
- Transmission Station and Transformers - Fire Protection and Prevention
- Safety Protocol for the Detection and Cleanup of SF6 Gas and SF6 Gas Decomposition Products in Buildings Following Catastrophic Failure and Release from Indoor SF6 Gas Insulated Switchgear
- Safety Protocol for Restoration of Substations Involved with Fires/Explosions

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Independent Power Distributors

Project Reports

Over the years more than 1500 projects have been completed and published in the fields of:

Generation; Transmission
Distribution; Utilization

For a complete listing, please consult our website.

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