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Circuit Breaker Reliability

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Major Events

- ✓ 1996 Dual Unit Outage
- ✓ 1997 EPRI PCM Template Implementation
- ✓ 2002 480V MCC CB Failures
- ✓ 2004 Unit 3 Loss of Offsite Power

2

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Problem Identification - Priorities

- ✓ Understanding the Problem
- ✓ Addressing the Problem Timely
- ✓ Rigor of Troubleshooting
- ✓ OEM Involvement
- ✓ Outside Experience/OPEX
- ✓ Recognition of Mechanical/Structural Issues
- ✓ External Influences - Switchyard

3

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Rigor of Troubleshooting

- ✓ Complex Troubleshooting
 - Preserve Evidence
 - Quarantine
 - Troubleshooting Plans
 - OPEX
 - Peer Sites (Quad Cities)

4

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Failure Analysis

- ✓ Vendor Testing
 - OEM
 - Independent Labs
- ✓ Failure Analysis
 - Mechanical
 - Electrical
 - Chemical (lubrication)
 - Civil/Structural

5

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Preventive Maintenance

- ✓ Predictive Maintenance – thermography
- ✓ PCM Templates – Procedure Based
- ✓ Vendor (OEM) Input – Up to Date Vendor Manuals
- ✓ Vendor Overhauls/Upgrades
- ✓ Internal Events
- ✓ Craft Feedback/SME Feedback/Images
- ✓ Incorporation of Design Basis Assumptions

6

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Replacement/Major Projects

- ✓ Aging Equipment – long term strategy
- ✓ Obsolete Parts/OEM no longer available
- ✓ Scope of work – Sizing/External Factors/Reliability
- ✓ Unavailability Time – Overhaul vs Swap Out
- ✓ Cost of PM versus Replacement

7

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External Issues - Switchyard

- ✓ Interface with Switchyard Owner
- ✓ Rigor of PM Program
- ✓ Rigor of Troubleshooting
- ✓ Upgrades
- ✓ OTDM Review of Work Scope
- ✓ Planning of Work Scope

8
