Charles J. Mozina - Resume

Charles (Chuck) J. Mozina is a Consultant specializing in transformer, power plant and generator protection. He is an active 30-year member of the IEEE PES Power System Relay Committee and was the past chairman of the Rotating Machinery Subcommittee. Chuck is active in the IEEE IAS I&CPS, PCIC and PPIC Committees, which address industrial protection systems. He is the current chair of the IAS Medium Voltage Protection Subcommittee. Chuck is the 1993 recipient of the Power System Relay Committee's Career Service Award and the 2002 IAS I&CPS Ralph Lee Prize Paper Award. His papers have been republished in the IAS Industrial Applications Magazine. He is the past U.S. representative (1993-2000) to CIGRE Study Committee 34 (now B-5) on System Protection and received the CIRGE US National Technical Committee Award for Outstanding Contribution to Power System Protection in 2000.

Chuck has a BSEE from Purdue University and is a graduate of the eight-month GE Power System Engineering Course. He has over 30 years of experience as a protection engineer at Centerior Energy (now FirstEnergy), a major utility in Ohio, where he was Manager of System Protection Department. For 10 years, Chuck was employed by Beckwith Electric as the Manager of Application Engineering for Protection and Protection Systems. He is a registered Professional Engineer in the state of Ohio and a Life Fellow of the IEEE.

LIST OF PROPOSED LECTURE TOPICS

1. PROTECTION OF SYNCHRONOUS GENERATORS AT MEDIUM VOLTAGE INDUSTRIAL FACILITIES

The lecture will highlight the protection of MV generators *at* industrial facilities. Generators, whether large or small need to be protected not only from internal short circuits, but from abnormal operation conditions, such as overexcitation, overvoltage, loss-of-field, unbalanced currents, reverse power, and abnormal frequency. When subjected to these conditions, damage or complete failure can occur within seconds, requiring automated detection and tripping. This lecture addresses the methods, practices and industry standards used to provide the electrical protection of generators. This includes a discussion of insurance implications on generator protection and the application of new digital relay technology.

LECTURE OUTLINE

- Introduction-basic concepts, industry standards and generator grounding, hybrid grounding
- Generator stator phase fault protection
- Field ground protection
- Stator ground fault protection—Hybrid generator grounding protection
- Abnormal frequency protection
- Overexcitation/overvoltage protection
- VT signal loss protection
- Loss-of-field protection
- Out-of-step protection
- Negative sequence (current unbalance) protection
- System backup
- Off-line generator inadvertent energizing
- Generator breaker failure
- Generator tripping/shutdown options
- Application of digital generator protection

2. PROTECTION OF MEDIUM VOLTAGE TRANSFORMERS AT INDUSTRIAL FACILITES

The lecture will cover the basics of protecting medium voltage industrial transformers as discussed in IEEE/ANSI standard C37.91 (Guide for Protective Relay Applications for Power Transformers) and the IAS Buff Book (IEEE Standard 242-2001). It will also address

new protection techniques made possible by modern digital transformer relays. Topics covered will include: transformer basics, why transformers fail, polarity and phasing standards (ANSI and IEC), IEEE through fault withstand capability standards, de-mystifying wye-delta and delta-wye phase shifts, fuse/overcurrent/ differential protection, CT requirements, slope, harmonic restraint, overexcitation limits and protection methods, commissioning and relay testing, application of fault pressure relays. The lecture highlights the protection of transformers grounded through 200-400A grounding resistors – a common practice at industrial facilities requiring sensitive ground differential protection. Case studies of actual in-service events will also be discussed.

3. DESIGN AND OPERATION OF MOTOR BUS TRANSFER SCHEMS AT INDUSTRIAL FACILITIES

This lecture discusses the design and operation of automatic schemes to transfer loads from an interrupted bus section to the alternate bus within industrial facilities without damaging the motors being transferred. It is extremely important to maintain continuity of electric service to these facilities when the normal source has sustained an outage. Many industrial facilities have at least two independent supply sources. Each source supplies a bus section (typically at 4.16 or 13.8 KV in the US) with a normally open bus tie between the bus sections. Upon loss of supply, the bus section must be quickly transferred to the alternate supply to avoid a major outage. The transfer must be done without damaging the motors supplied from the bus section that has sustained the outage. The lecture discusses various schemes to provide this transfer, operating experience with each scheme, plus new designs made possible through the use of digital technology.