



Tacit Knowledge Capture and Brain-Drain at Electric Utilities, an IEEE Perspective

-- Technical Presentation --
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1. Abstract

As a consequence of an aging workforce, electric utilities are at risk of losing their most experienced and knowledgeable electrical engineers. This presentation will address what electric utilities are doing to capture the tacit knowledge or know-how of these engineers. The presentation will include the experiences of a U.S. utility, their recognition of the potential risk, and their timely actions to address the issue. This presentation focuses on a qualitative research study that explored the tacit knowledge capture strategies currently used at seven U.S. electrical utilities which have demonstrated an industry commitment to improving operational standards.

The presentation is provided in three parts. In the first section, Dr. Perjanik will introduce the study and provide a brief overview of the Brain-Drain topic within the electrical utility industry. The problem and significance of the issue to electrical engineers and utilities will be provided. Mr. VanderWalt will then offer a utility's perspective of the issue and what steps a U.S. utility has been taking to identify this risk, implement strategies to reduce it, and ensure operational stability. In the final section, the results of the study will be provided to the members as strategic tools to implement within their own electrical engineering departments or organizations.

2. Learning Objectives

This presentation will help engineers understand the real benefits, challenges, and risks associated with capturing the experience-based knowledge of senior and retiring engineers. It will provide electrical engineering departments and organizations with tools to capture this knowledge before it "walks out the door". The experience and identification of knowledge capture strategies currently used in the industry provides members with timely information needed to ensure operational continuity and maintain organizational assets.

3. Learning Outcomes

As a result of attending this presentation, participants will gain an understanding of:

- The current "Brain-Drain" and its relevance to the electrical utility industry.
- Knowledge management practices, leadership, culture, and hoarding issues experienced within electrical engineering departments at U.S. utilities.

- The operational challenges and best practices experienced at seven U.S. electrical utilities.
- What ten tacit knowledge capture strategies electric utilities are implementing to capture the tacit knowledge or know-how of senior engineers, to ensure operational continuity in the delivery of safe, reliable, and sustainable power.

4. Presenters' Biographies

Nick Perjanik, Ph.D., MBA is the Manager of Knowledge Services for WEIDMANN Electrical Technology. Nick has 18 years of laboratory and management experience with the diagnostic testing of electrical insulating fluids and materials and the global education and training of condition based maintenance and monitoring programs. He began his career as an analytical chemist with Analytical Associates, Inc. in 1987, and became the general manager of Analytical ChemTech International, Inc. (ACTI) in 1995. Prior to being acquired by WEIDMANN Diagnostic Solutions, Inc. in 2000, Nick expanded ACTI to five laboratories in the U.S. and Canada and wrote several technical papers. Nick joined WEIDMANN Electrical Technology in 2011 and is currently responsible for information and knowledge services. He received his Bachelor's degree in Chemistry and his Master's degree in Business Administration from California State University, Sacramento, and earned a Ph.D. in Management in 2016, with studies in applied management and decision sciences from the School of Management and Technology at Walden University. Nick is a member of the ASTM D-27 Technical Committee on Electrical Insulating Liquids and Gases, the CIGRE WG47 on DGA, and is an Active Participant of the IEEE Transformers Committee.

Alwyn VanderWalt was born and raised in South Africa, where he received a Bachelor's degree in Electrical Engineering in 1989 before starting his engineering career with Eskom as a protection engineer. While working for Eskom, he received a Master's degree in Engineering Management. In 1997 he immigrated to the USA with his family, where he continued his career in the utility industry as an electrical engineer with Texas New Mexico Power Company, based in Silver City, New Mexico. He became interested in power transformers as a result of having to investigate a few transformer failures, and subsequently being involved with the replacement of those transformers. He has been involved with the specification, purchasing, testing and maintenance of transformers in one way or another ever since. In 2004 he accepted a position with PacifiCorp in Salt Lake City where he remained involved with transformers as part of his duties. On behalf of PacifiCorp, he attended numerous manufacturer production inspections throughout the world. In addition to being a key participant involved with updating PacifiCorp's transformer purchase specifications, he was responsible for or involved with creating, revising and updating all of their substation equipment installation and maintenance procedures. He started attending the IEEE Transformers Committee meetings in 2013, and has been an Active Participant since, most recently assuming the role of Vice Chair of WG C57.93. At the end of 2014, he moved back to New Mexico, accepting a position with Public Service Company of New Mexico, where he serves in his current role as Director of Protection and Control Engineering, and Substation and Meter Operations.