INCIPIENT ARC DETECTION OF LARGE DC MOTORS BASED ON AN ARCING MODEL MATCHED FILTER RESPONSE

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Abstract

Arcing in a high power energy system has a detrimental effect on the operational performance, energy efficiency, life cycle and operating and support costs of the facility. Under heavy arcing conditions, these systems pose a threat to the humans that operate the equipment as well as the plant infrastructure. Arcing can occur in motors, switching-networks, transformers, etc. and have an additional negative effect due to the electromagnetic pulse or interference that radiates from the event. A capability is needed to identify single events and/or entrained events in such a manner as to provide an effective measure (or grading) of arcing occurrence. This measure could then be normalized to a process operation to provide a performance index of system health. This paper details the development of a model-based matched filter approach that identifies single and/or multiple arcing events independent of source, calculates an energy estimate, and then a measure (or grading) as a function of process along with a confidence estimate.