American Nuclear Society
Standards Committee

ANS Issues Clarification on ANSI/ANS-58.14-2011 (R2022), *Safety and Pressure Integrity Classification Criteria for Light Water Reactors*.

(*Nuclear News*, April 2022)

Inquiry

Shall the safety-related mechanical parts of electrical components meet the requirements of ASME B&PVC, Sec. III, or other codes and standards?

Response

Sec. 6.2 of ANSI/ANS-58.14-2011 (R2022) states

> "Safety-related electrical items shall be designated as IEEE Class 1E items and shall meet the requirements for IEEE Class 1E items."

If the motor and its shaft (i.e., parts) have been determined to be safety-related through definition of its design function, ANSI/ANS-58.14-2011 (R2022) requires only that Institute of Electrical and Electronics Engineers guidance for such equipment be followed and provides no further direction. The need to meet American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (B&PVC), Sec. III, or some other standard, is beyond the scope of ANSI/ANS-58.14-2011 (R2022).

The inquiry identifies a concern regarding the design requirements for the mechanical parts (motor shaft) of an electrical component (motor). Sec. 4.5.3.4 of ANSI/ANS-58.14-2011 (R2022) states

> "Components or parts relied upon for performance of mechanical safety-related functions shall be classified safety-related."

The inquiry requests ANSI/ANS-58.14-2011 (R2022) clarification whether the mechanical parts of safety-related electrical components should meet the requirements of ASME B&PVC, Sec. III, or some other standard. This request is beyond the scope of ANSI/ANS-58.14-2011 (R2022). The scope of ANSI/ANS-58.14-2011 (R2022) is to provide criteria and processes for the classification of items for safety and pressure integrity. Once the classification process defined in ANSI/ANS-58-14-2011 (R2022) is completed, the specific design requirements associated with an assigned classification are left to be provided in applicable design-requirements standards. This is because specific design requirements for a given classification varies by item type and within the relevant regulatory body or standards organization. Basic, high-level, design requirements are discussed in Sec. 6 but only as related to item classification designations used in ANSI/ANS-58.14-2011 (R2022).

ANSI/ANS-58.14-2011 (R2022) does address the related issue of the inquiry of a component or part. The methodology described in Sec. 3.3 provides for the classification of items to the part level. However, the methodology requires the function of the item to be defined prior to the determination of component or part. This is because the classification of an item is based on the design function of the item being

classified. Consequently, if an assembly of parts (i.e., component) is necessary to complete the design function, then all parts of the component necessary to accomplish the function are required to have the same classification. ANSI/ANS-58.14-2011 (R2022), Sec. 4.5.2, provides provisions for individual parts of a component not related to the design function to be excluded from the component classification. For example, if the design function of a valve is to maintain a safety-related pressure boundary, the valve body shall be classified as safety-related and valve motor may be determined by documented evaluation to not be safety related. ANSI/ANS-58.14-2011 (R2022) Secs. C.5 (component), C.6 (part), and C.7 (part) of Appendix C provide examples of the classification of items based on the design function of the item.

For the example provided in the inquiry, if the mechanical shaft of a safety-related electrical motor is required to accomplish the motor design function, the shaft is a necessary part of the electric motor component and shall be classified as safety-related. Design requirements specific to the mechanical shaft of a safety-related motor would first depend on commitments found in the licensing documents with design considerations of function and environment. The Nuclear Quality Assurance Program should be consulted in determining mechanical shaft design requirements, either for specifications for a new motor build or for acceptance criteria for an established vendor design.