

Safety Basis Approaches – ISA vs. DSA – One Safety Analyst’s Opinion

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The Department of Energy (DOE) nonreactor nuclear facilities and the private industry nuclear fuel cycle facilities (regulated by the Nuclear Regulatory Commission [NRC]) have similar hazards and potential accidents. However, their safety bases are regulated by different (1) federal agencies, (2) regulations, and (3) (although somewhat similar) hazard and accident analysis techniques. Generally, the “bottom line” of safety bases documentation is to (1) assess the risk vs. an established standard and (2) identify a set of credited controls to ensure the risk is appropriately managed. This paper provides an objective overview of the two approaches (Integrated Safety Analysis [ISA] vs. Documented Safety Analysis [DSA]). The DOE approach (DSA) is more of a consequence-based approach while the NRC approach (ISA) is more of a layer of protection analysis (LOPA) approach.

A fictitious nonreactor nuclear facility is used to illustrate the similarities and differences between the approaches and the techniques are linked back to other techniques used in nonnuclear industries. General guidance referenced in both regulations is from the Center for Chemical Process Safety’s (CCPS’s) “Red Book” (*Guidelines for Hazard Evaluation Procedures*).