Baseline Design Criteria

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- Issue:
  - Provide guidance for level of detail and type of information to address BDC.

- Regulatory Basis:
  - 10 CFR 70.64(a) requires BDC to be addressed for new facilities/processes at existing facilities* (unless demonstrated otherwise).
  - 10 CFR 70.65(b)(4) requires ISA Summary to demonstrate compliance with BDC.

* New processes at existing facilities are those that require a license amendment under 10 CFR 70.72 and are defined by the SRP as "systems-level or facility-level design changes to process equipment, process technology, facility layout, or types of licensed material possessed or used. Generally, this definition does not include component-level design changes or equipment replacement."

- Overall guidance:
  - Discuss each BDC separately as part of ISA Summary.
  - State clearly and specifically how design provides for requirement.
  - Adequately support how BDC is met by design.

- 10 CFR 70.64(a)(1), Quality Standards and Records
  - State how design is developed and implemented per management measures.
    - Address configuration management, organization, quality assurance program, and/or design control, as appropriate.
  - State how appropriate records will be maintained.
    - Address management measures for records.

- 10 CFR 70.64(a)(2), Natural Phenomena Hazards

  - State how design provides for adequate protection against natural phenomena considering most severe documented historical events for the site.

  - Examples of natural phenomena to consider:
    - Earthquakes and volcanoes;
    - Stream/coastal flooding;
    - Winds /tornadoes;
    - Ice/snow loadings;
    - Temperature extremes.

- 10 CFR 70.64(a)(3), Fire Protection

  - State how design provides for adequate protection against fires/explosions.

  - Discussion could include per the SRP:
    - Fire safety management with fire safety organization and responsibilities;
    - Use FHAs in the ISA and pre-fire planning;
    - Building construction, fire areas, life safety, and ventilation;
    - Process fire safety including explosion protection;
    - Fire protection systems including detection/suppression;
    - Manual fire suppression capability and emergency response.

- 10 CFR 70.64(a)(4), Environmental and Dynamic Effects

  - State how design provides for adequate protection from environmental conditions and dynamic effects associated with normal operations, maintenance, testing, and postulated accidents that could lead to the loss of safety functions.

  - Discussion could include:

    - How design ensures IROFS perform safety function under service conditions;

    - How design ensures non-IROFS do not prevent IROFS from performing their safety functions under service conditions.

- 10 CFR 70.64(a)(5), Chemical Protection
  - State how the design provides for adequate protection against chemical risks produced from licensed material, facility conditions which affect safety of licensed material, and hazardous chemicals produced from licensed material.
  - Separate chemical safety program not required.

- 10 CFR 70.64(a)(5), Chemical Protection (continued)
  - Discussion could include:
    - Operator actions when designated as IROFS or within IROFS boundary.
    - Operator IROFS actions of commission (i.e., operator closes a chemical addition valve on a high tank level).
  - Discussion need not include:
    - Operator IROFS prohibited actions (i.e., operator may not add more than 1 liter of 1N nitric acid to a tank).

- 10 CFR 70.64(a)(6), Emergency Capability
  - State how design provides for emergency capability to maintain control of licensed material/hazardous chemicals produced from licensed material.

- 10 CFR 70.64(a)(6), Emergency Capability (continued)
  - State how design provides for emergency capability to maintain control of the evacuation of onsite personnel.
  - Discussion could include:
    - What criteria are used in design to allow personnel to evacuate, if required, and why;
    - Acceptable criteria could include maximum time to evacuate, maximum radiological/chemical dose, or ease of egress.

- 10 CFR 70.64(a)(6), Emergency Capability (continued)
  - State how design provides for emergency capability to maintain control of onsite emergency facilities and services that facilitate use of available offsite services.

- 10 CFR 70.64(a)(7), Utility Services
  - State how design provides for continued operation of essential utility services.
  - Possible design features could include:
    - For large essential utility electrical loads – diesel generator with automatic start;
    - For small essential utility electrical loads – uninterruptible power supply.

- 10 CFR 70.64(a)(8), Inspection, Testing, and Maintenance

  - State how the design of IROFS provide for adequate inspection, testing, and maintenance to ensure their availability and reliability to perform their function when needed.
  - Possible design features could include:
    - Capability for periodic test and inspection to assess the operability and performance of IROFS.
    - Capability to test IROFS such as active engineered controls as a whole and under design conditions.

- 10 CFR 70.64(a)(9), Criticality Control
  - State how design provides for criticality control.
  - Discussion could include per the SRP:
    - Nuclear criticality safety program organization and responsibilities;
    - NCS evaluations used in ISA;
    - Management measures applied to controls/IROFS;
    - Calculations performed using validated methods, including subcritical margin;
    - Methods of criticality control & technical practices;
    - Controlled parameters and limits;
    - Criticality accident alarm system;
    - Implementation of double contingency.

- 10 CFR 70.64(a)(10), Instrumentation and Controls

  - State how the design provides for inclusion of instrumentation and control systems to monitor and control IROFS.
    - IROFS to be monitored and controlled are limited to active engineered or augmented administrative controls.

  - Possible design features could include the following to monitor IROFS:
    - Failure detection diagnostics;
    - Information read-out;
    - Bypass indication for IROFS intentionally rendered inoperable more often than annually;

- 10 CFR 70.64(a)(10), Instrumentation and Controls (continued)
  - Possible design features could include the following to control IROFS:
    - Manual initiation of active engineered controls that ensure all safety actions occur with minimal amount of manual controls.
    - Once initiated, the safety action should go to completion.
    - System restoration should require deliberate operator action.