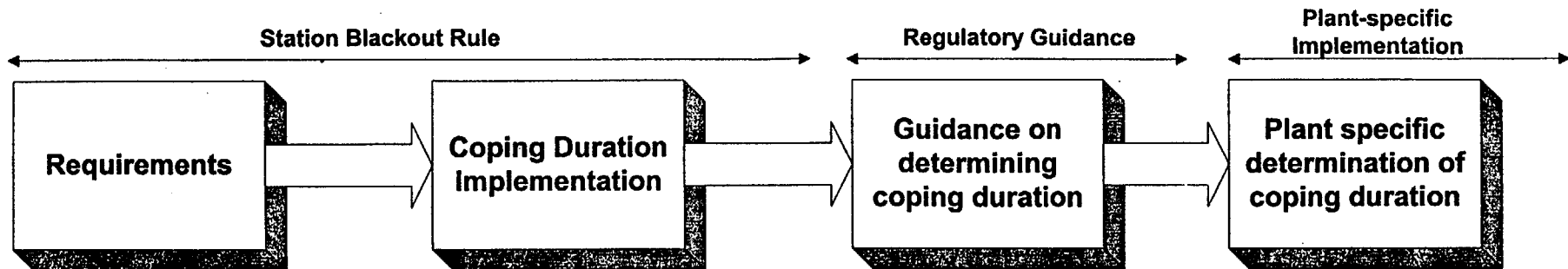


# SBO Rule

"...withstand for specified duration and recover from a station blackout..."



## **§50.63 Loss of all alternating current power.**

(a) Requirements. (1) Each light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout as defined in §50.2. The specified station blackout duration shall be based on the following factors:

- (i) The redundancy of the onsite emergency ac power sources;
- (ii) The reliability of the onsite emergency ac power sources;
- (iii) The expected frequency of loss of offsite power; and
- (iv) The probable time needed to restore offsite power.

## **§50.63 Loss of all alternating current power.**

(c) Implementation--(1) Information Submittal. For each light-water-cooled nuclear power plant licensed to operate on or before July 21, 1988, the licensee shall submit the information defined below to the Director of the Office of Nuclear Reactor Regulation by April 17, 1989. For each light-water-cooled nuclear power plant licensed to operate after the effective date of this amendment, the licensee shall submit the information defined below to the Director by 270 days after the date of license issuance. (i) A proposed station blackout duration to be used in determining compliance with paragraph (a) of this section, including a justification for the selection based on the four factors identified in paragraph (a) of this section;

## **Reg Guide 1.155, Section 3, Ability to Cope with a Station Blackout**

*"Regulatory Position 3.1 provides a method to determine an acceptable minimum time that a plant should be able to cope with a station blackout based on the probability of a station blackout at the site as well as the capability for restoring ac power for the site."*

## **Section 3.1, Minimum Acceptable Station Blackout Duration Capability**

*"A method for determining an acceptable minimum station blackout duration capability...is given in Table 2....Table 2 can be used to determine the acceptable minimum station blackout duration capability for each plant."*

**NUREG-1032**, *"The purpose of this work was to develop generic loss of offsite power relationships that would allow differentiation of plant design, operational, and location factors that can significantly affect the expected frequency and duration of loss-of-offsite-power events."*

Determination of minimum acceptable Station Blackout Duration Capability, using Reg Guide 1.155 (or NUMARC 87-00), takes into account the following factors:

- Redundancy of the onsite emergency ac power system,
- Independence of offsite power,
- Severe weather,
- Severe weather recovery,
- Extremely severe weather

Documentation Supporting the NRC Position that Licensees have Provided an Analysis that Relies in Part on the Offsite Power System to Establish the SBO Coping Duration

10 CFR 50.63(a)(i)

"Each light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout as defined in §50.2. The specified station blackout duration shall be based on the following factors:

- (i) The redundancy of the onsite emergency ac power sources;
- (ii) The reliability of the onsite emergency ac power sources;
- (iii) The expected frequency of loss of **offsite power**; and
- (iv) The probable time needed to restore **offsite power**."

Regulatory Guide 1.155, Station Blackout, Section 3.1

"Each nuclear plant should be able to withstand and recover from a station blackout lasting a specified minimum duration. The specified duration of station blackout should be based on the following factors:

1. The redundancy of the offsite emergency ac power system (i.e., the number of power sources available minus the number needed for decay heat removal),
2. The reliability of each of the onsite emergency ac power sources (e.g., diesel generator),
3. The expected frequency of loss of **offsite power**, and
4. The probable time needed to restore **offsite power**.

A method for determining an acceptable minimum station blackout duration capability as a function of the above **site-** and **plant-related** characteristics is given in Table 2. Tables 3 through 8 provide the necessary detailed descriptions and definitions of the various factors used in Table 2."

Regulatory Guide 1.155, Station Blackout, Section 2

"Procedures should include the actions necessary to restore **offsite power** and use nearby power sources when offsite power is unavailable. As a minimum, the following potential causes for loss of offsite power should be considered:

- Grid undervoltage and collapse
- Weather-induced power loss
- Preferred power distribution faults that could result in the loss of normal power to essential switchgear buses"

Statement of Considerations, Station Blackout, Federal Register Vol. 53, No. 119, Tuesday, June 21, 1988, Background

"On the basis of station blackout studies conducted for USI A-44 and presented in the reports referenced above, the NRC staff has developed Regulatory Guide 1.155 entitled "Station

Blackout," which presents guidance on (1) maintaining a high level of reliability for emergency diesel generators, (2) developing procedures and training to restore **offsite** and onsite emergency ac power should either one or both become unavailable, and (3) selecting a **plant specific** acceptable station blackout duration which the plant would be capable of surviving without core damage. Application of the methods in this guide would result in a selection of an acceptable station blackout duration (e.g., 2, 4, 8, or 16 hours) which depended on the **specific plant design and site-related characteristics** acceptable to the staff. However, applicants and licensee's could propose alternative methods to those specified in the regulatory guide in order to justify other acceptable durations for station blackout capability."