

### 15.3 Limiting Conditions for Operation

#### 15.3.0 General Considerations

A. Many of the Limiting Conditions for Operation (LCO) presented in these specifications provide a temporary relaxation of the single failure criterion, which is consistent with overall reliability considerations, to allow time periods during which corrective action may be taken to restore the system to full operability. If the situation has not been corrected within the specified time period, and the LCO prescribes no other specific action, action shall be initiated within one hour to place the affected unit in:

1. ~~an affected unit, which is critical, shall be placed in the hot~~ Hot shutdown condition within ~~three~~ seven hours of entering this specification; AND
2. Cold shutdown within 37 hours of entering this specification.

If the situation has not been corrected within the specified time period and affects both units, action shall be initiated within one hour on both units such that:

1. One unit is placed in hot shutdown within seven hours of entering this specification; AND
2. The second unit is placed in hot shutdown within ten hours of entering this specification; AND
3. Both units are placed in cold shutdown within 37 hours of entering this specification.

This specification is applicable during power operation, low power operation, and shutdown with temperature  $\geq 200^{\circ}\text{F}$ .

B. In the event an LCO cannot be satisfied because of equipment failures or limitations beyond those specified in the permissible conditions of the LCO, action shall be initiated within one hour to place the affected unit in:

1. ~~the affected unit, which is critical, shall be placed in the hot Hot shutdown condition within three seven hours of entering this specification discovery of the situation;~~ AND
2. Cold shutdown within 37 hours of entering this specification.

If the situation has not been corrected within the specified time period and affects both units, action shall be initiated within one hour on both units such that:

1. One unit is placed in hot shutdown within seven hours of entering this specification; AND
2. The second unit is placed in hot shutdown within ten hours of entering this specification; AND
3. Both units are placed in cold shutdown within 37 hours of entering this specification.

This specification is applicable during power operation, low power operation, and shutdown with temperature  $\geq 200^{\circ}\text{F}$

- ~~B. If the conditions which prompted the shutdown required by 15.3.0.A cannot be corrected, many LCOs specify an additional time period until the unit must be placed in the cold shutdown condition. If no such time period is specified, the unit shall be put into the cold shutdown condition within 48 hours of discovering the situation.~~
- C. Upon discovery of a Limiting Condition for Operation, the actions delineated in the specification shall be performed. If the requirements of the Limiting Condition for Operation are met or are no longer applicable prior to the expiration of the times delineated in the specification, completion of the specified actions is not required, unless otherwise stated.
- ED. When a system, subsystem, train, component or device is determined to be degraded inoperable solely because its emergency power source is inoperable, or solely because its

normal power source is inoperable, the system, subsystem, train, component or device may be considered operable for the purpose of satisfying the requirements of the applicable LCO, provided: (1)

1. The available the alternate power source (normal or emergency) is operable; and (2) AND
2. All all redundant system(s), subsystem(s), train(s), components(s) and device(s) are operable.

If either condition (1) or (2) 15.3.0.D.1 or 15.3.0.D.2 cannot be met, specifications 15.3.0.A and 15.3.0.B become applicable. This specification is not applicable during cold shutdown or refueling shutdown conditions.

DE. A momentary loss of normal or emergency power resulting in prompt immediate corrective or required action in accordance with Table 15.3.5-2, i.e., placing associated channels into the trip condition or shutdown of the unit, shall not be interpreted as causing a violation of the specification with respect to minimum operable channels or minimum degree of redundancy, unless said loss is the result of personnel operator error or procedural violation.

F. Equipment removed from service or declared inoperable to comply with required actions may be returned to service solely to perform testing required to demonstrate its operability or the operability of other equipment.

#### Bases

~~Specifications 15.3.0.A and 15.3.0.B delineate the action to be taken for circumstances not directly provided for in the action statements of the LCO and whose occurrence would violate the intent of the specification. For example, Specification 15.3.3.A.2.a permits a single Reactor Coolant System accumulator to be isolated for up to one hour during power operations. Under the terms of Specification 15.3.0.A and 15.3.0.B, if more than one accumulator is isolated or inoperable, the unit is required to be in hot shutdown within three hours of discovery of the condition and in the cold shutdown condition within the following 45 hours unless corrective measures are completed. As a further example, Specification 15.3.3.B.2.b permits one Containment Spray Pump to be out of service for~~

up to 48 hours during power operations. Under the terms of these Specifications, if both of the required Containment Spray Pumps are inoperable, the unit is required to be in hot shutdown within three hours, and in the cold shutdown condition within the next 45 hours. It is assumed the unit is brought to the required condition within the required times by promptly initiating and carrying out the appropriate statement.

Specification 15.3.0.C delineates additional conditions which must be satisfied to permit operation to continue, consistent with the Limiting Condition for Operation statements for power sources, when a normal or emergency power source is not operable. It specifically prohibits operation when one system, subsystem, train, component or device is inoperable because its normal or emergency power source is inoperable and a redundant system, subsystem, train, component or device is inoperable for another reason.

The provisions of this specification permit the action statements associated with individual systems, subsystems, trains, components, or devices to be consistent with the action statements of the associated electrical power source. It allows operation to be governed by the time limits of the action statement associated with the Limiting Condition for Operation for the normal or emergency power source, not the individual action statements for each system, subsystem, train, component or device determined to be inoperable solely because of the inoperability of its normal or emergency power source.

For example, Specification 15.3.7.A.1.e allows a 7-day out-of-service time for one emergency diesel generator. If the definition of operable were applied without consideration of Specification 15.3.0.C, all systems, subsystems, trains, components or devices supplied by the inoperable emergency power source would also be inoperable. This would invoke the applicable action statements for each of the applicable LCO. However, the provisions of Specification 15.3.0.C permit the time limits for continued operation to be consistent with the statement for the inoperable emergency diesel generator instead, provided the other specified conditions are satisfied. In this case, the corresponding normal power source must be operable, and all redundant systems, subsystems, trains, components, and devices must be operable, or otherwise satisfy Specification 15.3.0.C (i.e., be capable of performing their design function and have at least one normal or one emergency power source operable). If these conditions are not satisfied, shutdown is required in accordance with Specification 15.3.0.A.

As a further example, Specification 15.3.7.A.1.d requires in parts that

~~4160 volt buses A03 and A04 be energized for the unit to be taken critical. Specification 15.3.7.8.1.d permits either bus A03 or A04 to be taken out of service for up to seven days provided both diesel generators are operable and the associated diesel generator is operating and providing power to the engineered safeguard bus normally supplied by the out of service bus. If the definition of operable were applied without consideration of Specification 15.3.0.C, all systems, subsystems, trains, components, and devices supplied by the inoperable normal power sources (i.e., the out of service bus A03 or A04) would also be inoperable. This would invoke the applicable action statements for each of the applicable LCOs. However, the provisions of this Specification 15.3.0.C permit the time limit for continued operation to be consistent with the action statement for the operable normal power source, in this case seven days, provided the other specified conditions are satisfied. These conditions are that for the engineered safeguards systems on one bus the emergency power source must be operable (as must be the components supplied by the emergency power source) and all redundant systems, subsystems, trains, components and devices in the other engineered safeguards systems must be operable, or likewise satisfy Specification 15.3.0.C (i.e., be capable of performing their design function and have an emergency power source operable). In other words, both emergency power sources must be operable and all redundant systems, subsystems, trains, components and devices in both divisions of engineered safeguards systems must also be operable. If these conditions are not satisfied, shutdown is required in accordance with this specification.~~

~~In the cold shutdown and refueling shutdown conditions, Specification 15.3.0.C is not applicable, and thus the individual action statements for each applicable LCO in these conditions must be adhered to.~~

~~Specification 15.3.0.D addresses the momentary loss of power to a component when immediate action is initiated resulting in reenergization from an alternate source, tripping the channel of logic or initiating operator action as specified in Table 15.3.5-2. Such a situation does not constitute an unsafe condition. During the short period of the corrective or required action, the operator is sensitive to the condition of the unit and the possible effects of the logic systems, therefore the occurrence of such an event should not constitute a violation of the specification with respect to minimum operable channels or minimum degree of redundancy.~~

Specifications 15.3.0.A and 15.3.0.B delineate the actions to be taken for circumstances not directly provided for in the action statements of a Limiting Condition for Operation (LCO) and whose occurrence would violate the intent of the specification. These specifications delineate the time limits for placing the unit(s) in a safe condition when operation cannot be maintained within the limits for safe operation as defined by the LCO and its associated action statements. It is not intended to be used as an operational convenience that permits routine, voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable.

Upon entering 15.3.0.A or 15.3.0.B, one hour is allowed to prepare for an orderly shutdown before initiating a change in unit operation. This includes time to permit the operator to coordinate the reduction in electrical generation with system control to ensure the stability and availability of the electrical grid. The time limits specified to reach hot and cold shutdown permit the shutdown to proceed in a controlled and orderly manner that is well within the capabilities of the unit(s), assuming that only the minimum required equipment is operable. This reduces thermal stresses on components of the Reactor Coolant System and the potential for a plant transient that could challenge plant safety systems.

Should a shutdown of both units be required, 15.3.0.A and 15.3.0.B require that a change in operation be initiated within one hour on both units. The specifications also provide two different time limits for each unit to reach hot shutdown to allow plant operators to stagger the two shutdowns. This provides operational flexibility to ensure that plant operators are not overloaded during the shutdown process and that the shutdown of both units proceed in a controlled and orderly manner.

The time limits of 15.3.0.A and 15.3.0.B allow 37 hours for the unit(s) to be in cold shutdown when a shutdown is required during power operation. If the unit is in low power operation or hot shutdown when a shutdown is required, the time limit for reaching the next lower plant condition applies. If a lower plant condition is reached in less time than allowed, however, the total allowable time to reach cold shutdown is not reduced.

15.3.0.A and 15.3.0.B specify actions for conditions not covered in other specifications. The requirements of 15.3.0.A and 15.3.0.B do not apply when a unit is in cold or refueling shutdown because the unit is already in the most restrictive plant condition required by 15.3.0.A or 15.3.0.B.

15.3.0.C establishes that, upon discovery that a Limiting Condition for Operation has been entered, the associated actions shall be performed. The amount of time to complete each required action is applicable from the point in time that the action statement is entered. The required actions establish those measures that must be taken within specified times when the requirements of an LCO are not met. This specification establishes that:

1. Completion of the required actions within the specified times constitutes compliance with a specification; and
2. Completion of the required actions is not necessary when the requirements of an LCO are met within the specified amount of time, unless otherwise specified.

There are two basic types of required actions. The first type of action specifies a time limit in which the requirements of the LCO must be met. This is the amount of time to restore an inoperable system or component to operable status or to restore variables to within specified limits. If this type of action is not completed within the specified time, a shutdown may be required to place the unit in a condition in which the specification is not applicable. The second type of action specifies the remedial measures that permit continued operation of the unit(s) that is not further restricted by the completion time.

Completing required actions is not necessary when the requirements of an LCO are met or are no longer applicable, unless otherwise stated in the individual specification.

15.3.0.D delineates additional conditions which must be satisfied to permit operation to continue, consistent with the LCO statements for power sources, when a normal or emergency power source is not operable. It specifically prohibits operation when one system, subsystem, train, component, or device is degraded because its normal or emergency power source is inoperable and a redundant system,

subsystem, train, component, or device is inoperable for another reason.

The provisions of 15.3.0.D permit the action statements associated with individual systems, subsystems, trains, components, or devices to be consistent with the action statements of the associated electrical power source. It allows operation to be governed by the time limits of the action statement associated with the LCO for the normal or emergency power source, not the individual action statements for each system, subsystem, train, component, or device determined to be degraded solely because of the inoperability of its normal or emergency power source.

For example, 15.3.7.A.1.e allows a seven-day out-of-service time for one emergency diesel generator. If the definition of operable were applied without consideration of 15.3.0.D, all systems, subsystems, trains, components, or devices supplied by the inoperable emergency power source would also be inoperable. This would invoke the applicable action statements for each of the applicable LCOs. However, the provisions of 15.3.0.D permit the time limits for continued operation to be consistent with the statement for the inoperable emergency diesel generator instead, provided the other specified conditions are satisfied. The corresponding normal power source must be operable, and all redundant systems, subsystems, trains, components, and devices must be operable, or otherwise satisfy 15.3.0.D (i.e., be capable of performing their design function and have at least one normal or one emergency power source operable). If these conditions are not satisfied, shutdown is required in accordance with 15.3.0.A or 15.3.0.B.

In the cold and refueling shutdown conditions, 15.3.0.D is not applicable. Therefore, the individual action statements for each applicable LCO in these conditions must be followed.

15.3.0.E addresses the momentary loss of power to a component when prompt action is initiated resulting in reenergization from an alternate source, tripping the channel of logic, or initiating operator action as specified in Table 15.3.5-2. Such a situation does not constitute an unsafe condition. During the short period of the corrective or required action, the operator is sensitive to the condition of the unit and the possible effects of the logic systems, therefore the occurrence of such an event should not constitute a violation of the specification with respect to minimum operable channels or minimum degree of redundancy.



15.3.0.F establishes the allowance for restoring equipment to service when it has been removed from service or declared inoperable to comply with required actions. The sole purpose of 15.3.0.F is to provide an exception to 15.3.0.C to allow the performance of testing to demonstrate:

1. The operability of the equipment being returned to service; or
2. The operability of other equipment.

The amount of time that equipment is returned to service, in conflict with the requirements of the action statements, is limited to the time absolutely necessary to perform the allowable testing. 15.3.0.F does not provide time to perform any other preventive or corrective maintenance.

For example, 15.3.0.F allows a containment isolation valve that has been closed to comply with associated action statements to be reopened to perform the required operability testing on the valve. Additionally, 15.3.0.F allows an inoperable instrument channel to be taken out of the tripped condition in order to permit the trip system logic to function and indicate the appropriate response during the performance of testing on another instrument channel in the same trip system.

If the requirements of a Limiting Condition for Operation are not met, specifications in Section 15.3.0 delineate time limits for completing the actions within the associated action statement. Should an action statement specify more than one action, each action has its own time limit. Each time limit in Section 15.3.0 is referenced to the time that the action statement is entered. For example, 15.3.0.A requires the unit to be placed in hot shutdown within seven hours and in cold shutdown within 37 hours. In this case, a total of seven hours is allowed for reaching hot shutdown and a total of 37 hours, not 44 hours, is allowed for reaching cold shutdown from the time the action statement is entered. If hot shutdown is reached in three hours, the time allowed for reaching cold shutdown is the next 34 hours because the total time allowed for reaching cold shutdown is 37 hours.

The operable status of the various systems and components is to be demonstrated by periodic tests, defined by Specification 15.4.5. A large fraction of these tests will be performed while the reactor is operating in the power range. If a component is found to be inoperable it will be possible in most cases to effect repairs and restore the system to full operability within a relatively short time. For a single component to be inoperable does not negate the ability of the system to perform its function, but it reduces the redundancy provided in the reactor design and thereby limits the ability to tolerate additional equipment failures. If it develops that (a) the inoperable component is not repaired within the specified allowable time period or (b) a second component in the same or related system is found to be inoperable, the reactor will initially be put in the hot shutdown condition to provide for reduction of the decay heat from the fuel, and consequent reduction of cooling requirements after a postulated loss-of-coolant accident. This will also permit improved access for repairs in some cases. After a limited time in hot shutdown, if the malfunction(s) are not corrected, the reactor will be placed in the cold shutdown condition, utilizing normal shutdown and cooldown procedures. For example, specification 15.3.3.A.2.a allows one accumulator to be isolated or otherwise inoperable for periods of up to one hour. An inoperable accumulator may be defined as one with its outlet MOV shut, no pressure instrumentation operable, or water and/or nitrogen spaces cross-connected with the accumulator on the other loop. If the inoperable accumulator is not restored within one hour then the conditions of specification 15.3.0.A and 15.3.0.B apply which ~~requires the affected unit, if critical, to be in hot shutdown within three hours and in cold shutdown within 48 hours if the condition is not~~ corrected. In the cold shutdown condition there is no possibility of an accident that would release fission products or damage the fuel elements.

The specified repair times do not apply to regularly scheduled maintenance of the engineered safety systems, which is normally to be performed during refueling shutdowns. The limiting times to repair are based on:

- 1) Assuring with high reliability that the safety system will function properly if required to do so.
- 2) Allowances of sufficient time to effect repairs using safe and proper procedures.