

From: <jcoyle@peco-energy.com>
To: QWFN_DO.owf4_po(NVG,RLD)
Date: Tue, Oct 5, 1999 9:32 PM
Subject: IEEE SCC 29 review of DC TS-TSB

Nanette Gilles,

The Nuclear Task Force of SCC29, IEEE, met on October 4, 1999 and reached consensus on the DC Tech Specification received from Robert Dennig 9/30/99.

Additionally the Comments by Dan Williamson and the TSTF were reviewed.

Attendance:

Steve Clark	Ed Stallings
Mike Flack	Omi Samanta
Kyle Floyd	Gabriel Barteck
Wayne Johnson	Jose' A. Marrero
Tim Bolgeo	Hollen Crim
S. N. Saba	Tom Carpenter
Sam Shah	Bob Beavers
Paul Hellen	John Coyle

The NTF found this version to be an improvement in legibility over previous versions. Technical agreement was reached after reviewing the combination of the above documents (TS, accompanied by DW & TSTF comments). The NTF offers one comment not previously identified,

SR 3.8.4.2 The term "[# connected cells x 2.22]" may be better expressed as "minimum float voltage".

The value [# connected cells x 2.22] would be discussed in the basis. Please contact me if you have any questions.

Respectfully,
John K. Coyle
NTF Meeting Chair (alternate), NTF

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Response to Electrical & Instrumentation and Controls Branch Comments on a Proposed Consolidate Draft of Standard Technical Specifications (STS) 3.8.4, 3.8.5, and 3.8.6

1. Condition A included of 3.8.5 should be removed.

A separate condition for inoperable battery chargers was the subject of extensive technical discussion and has been incorporated into TS 3.8.4. The staff proposal presented at the 9/20/99 meeting also contained a separate condition for inoperable charges in TS 3.8.5. The consolidated draft sent for comment maintains consistency between 3.8.4 and 3.8.5 and with the earlier staff proposal and has been approved by the IEEE.

2. Required Action to suspend operation immediately when there is a potential for draining the vessel should be added to 3.8.5.

As the TSTF pointed out in their comments and the IEEE agreed to, Required Action B.2.3 in the consolidated draft is PWR-specific. The BWR-specific Action will be "Initiate action to suspend operations with a potential for draining the reactor vessel," consistent with other specifications in the BWR STS with applicability in the shutdown modes. This will be noted in the cover letter transmitting the specifications to the TSTF.

3. The 2.07 volts specified in Condition A of 3.8.6 has not been justified.

The 2.07 V limit has been justified as it is the operability limit, carried over from the current revision of the STS (Rev 1) and, therefore, is the appropriate limit for the TS. This has been endorsed by the IEEE.

4. With respect to Required Action A.3 of 3.8.6, the term "limits" has not been defined.

As is TS convention, the use of the word "limit" in Required Action A.3 refers to the limit defined in Condition A.

5. With respect to the Reviewer's note in 3.8.6, IEEE 450-1995 does not define a program as indicated for battery parameters. The program and its basis needs to be defined and justified for all cell voltages over the design life of the battery cell.

The reviewer's note is meant to indicate that the licensee should implement a program that is consistent with the recommended practices of IEEE 450-1995. No regulatory basis could be established to require maintenance actions such as voltage monitoring above the operability limit (2.07 volts) in technical specifications. The IEEE NTF approved the note as worded in the consolidated draft.

6. With respect to Condition A of 3.8.6, allowing redundant batteries to be degraded (and possibly inoperable because cell voltage or one or more cells in redundant batteries is below 2.07 volts) at the same time for 24 plus 12 hours has no justification.

The issue of allowing one or more batteries to be "degraded" was the subject of extensive technical discussion and Condition A has been approved by the IEEE as being technically acceptable. The version of 3.8.6 presented by the staff at the 9/20/99 meeting allowed 24 hours to restore float voltage of affected cells when it is below limits. Therefore, it appears that the only issue is the 12 hours allowed to restore an inoperable battery in 3.8.4, Condition B. Note that Condition B of 3.8.4 only allows one battery or two batteries in the same train to be inoperable. It does not allow redundant batteries to be inoperable. We have decided to leave the current STS Completion Time of 2 hours in brackets in the final draft and the Bases will explain that any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for them following the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,". RG 1.177 provides guidance for using a risk-informed method for determining Completion Times.

7. Completion Time for Required Action C.2 of 3.8.6 should be 2 hours and once per 12 hours thereafter for 7 days. There is no justification for having a possible inoperable battery cell for 12 hours before it is tested.

With electrolyte level below the limit the first action should be to restore electrolyte level. The Completion Time for this action (Required Action C.1) is 8 hours. The next action is the verify battery connected cell voltage and 12 hours is a reasonable time to perform this action as it is only allowing 4 additional hours after restoring electrolyte level.

8. Following restoration of electrolyte level should be added to Required Action C.2 of 8.3.6.

The TSTF commented that the Required Action C.2 should have read, "Perform SR 3.8.6.5 for affected cells." Requiring performance of SR 3.8.6.3 would be meaningless when already in the Actions for low electrolyte level. The IEEE agreed with the TSTF and the correction has been made in the latest consolidated draft.

9. With respect to Condition D of 3.8.6, allowing redundant batteries to be inoperable for 12 hours plus an additional 12 hours (or 24 hours) due to temperature of electrolyte cannot be technically justified.

The version of 3.8.6 presented by the staff at the 9/20/99 meeting allowed 12 hours to restore one or more battery cell temperatures when below limits. Therefore, it appears that the only issue is the 12 hours allowed to restore an inoperable battery in 3.8.4, Condition B. Note that Condition B of 3.8.4 only allows one battery or two batteries in the same train to be inoperable. It does not allow redundant batteries to be inoperable. We have decided to leave the current STS Completion Time of 2 hours in brackets in the final draft and the Bases will explain that any licensee

wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for them following the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,". RG 1.177 provides guidance for using a risk-informed method for determining Completion Times.

10. With respect to Condition E of 3.8.6, allowing redundant batteries to be inoperable for 12 hours with battery float current greater than 10 amps cannot be technically justified.

Again, this is an issue with the 12 hours allowed to restore an inoperable battery in 3.8.4, Condition B. Note that Condition B of 3.8.4 only allows one battery or two batteries in the same train to be inoperable. It does not allow redundant batteries to be inoperable. We have decided to leave the current STS Completion Time of 2 hours in brackets in the final draft and the Bases will explain that any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for them following the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,". RG 1.177 provides guidance for using a risk-informed method for determining Completion Times.

11. SR3.8.6.1 requires float current to be verified between 0 and 2 amps. A Required Action is needed when current is less than or equal to 0 amps that states the battery is inoperable. Allowing any one battery to operate without charge for 24 hours plus 12 hours cannot be technically justified.

Condition B of 3.8.6 would be entered when float current was ≤ 0 amps. Required ACTION B.1 requires restoration of float current to within the limits of SR 3.8.6.1 in 24 hours, otherwise the battery must be declared inoperable. The IEEE NTF approved these requirements.

12. In SR 3.8.6 float current greater than 0 amps should be changed to float current is at a measurable value greater than 0 amps.

This was discussed at the 9/20/99 and the consensus was that the term "measurable value" was beyond the level of detail typically found in TS. Even the staff's surveillance requirement for float current presented at the 9/20/99 meeting (SR 3.8.4.2) did not contain the phrase "measurable value greater than 0 amps."

13. The 2.07 volts specified in SR 3.8.6.2 has not been justified

The 2.07-V limit has been justified as it is the operability limit, carried over from the current revision of the STS (Rev 1), and, therefore, is the appropriate limit for the TS. This has been endorsed by the IEEE.

14. SR3.8.6.2 should use the same limit as stated in SR 3.8.6.5

We agree. The TSTF also made this comment and it has been incorporated.

15. With respect to Condition C of 3.8.6, allowing redundant batteries to be degraded at the same time (and possibly inoperable because electrolyte level was below the top of the plates of one or more cells) for 8 plus 12 hours cannot be technically justified.

The issue of allowing one or more batteries to be "degraded" was the subject of extensive technical discussion and Condition C has been approved by the IEEE as being technically acceptable. The version of 3.8.6 presented by the staff at the 9/20/99 meeting allowed 8 hours to restore electrolyte level of affected cells when it is below limits. Therefore, it appears that the only issue is the 12 hours allowed to restore an inoperable battery in 3.8.4, Condition B. Note that Condition B of 3.8.4 only allows one battery or two batteries in the same train to be inoperable. It does not allow redundant batteries to be inoperable. We have decided to leave the current STS Completion Time of 2 hours in brackets in the final draft and the Bases will explain that any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for them following the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,". RG 1.177 provides guidance for using a risk-informed method for determining Completion Times.

16. With respect to Condition B of 3.8.6, allowing redundant batteries to be degraded at the same time (and possibly inoperable because float current is greater than or equal to 2 amps) for 24 plus 12 hours cannot be technically justified.

The issue of allowing one or more batteries to be "degraded" was the subject of extensive technical discussion and Condition B has been approved by the IEEE as being technically acceptable. The consensus was that the battery was not necessarily inoperable if its float current was greater than 2 amps for a short period of time (< 24 hours). Again, Condition B of 3.8.4 only allows one battery or two batteries in the same train to be inoperable. It does not allow redundant batteries to be inoperable. We have decided to leave the current STS Completion Time of 2 hours in brackets in the final draft and the Bases will explain that any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for them following the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,". RG 1.177 provides guidance for using a risk-informed method for determining Completion Times.

17. With respect to Condition B of 3.8.6, allowing redundant batteries to be inoperable at the same time because float current is less than 0 amps for 24 plus 12 hours cannot be technically justified.

The issue of allowing one or more batteries to be "degraded" was the subject of extensive technical discussion and Condition B has been approved by the IEEE as being technically acceptable. The consensus was that the battery was not necessarily inoperable if its float current was less than 0 amps for a short period

of time (< 24 hours). Again, Condition B of 3.8.4 only allows one battery or two batteries in the same train to be inoperable. It does not allow redundant batteries to be inoperable. We have decided to leave the current STS Completion Time of 2 hours in brackets in the final draft and the Bases will explain that any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for them following the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications,". RG 1.177 provides guidance for using a risk-informed method for determining Completion Times.

18. With respect to Condition E of 3.8.6 and Condition B or C of 3.8.4, an additional 12 hours beyond that which is specified as a completion time in Condition A, B, C, and D of 3.8.6 cannot be technically justified.

This comment is a repeat of comments 6, 9, 15, 16, & 17.

19. Required Action A.1 [or (a)] of 3.8.4 allows a battery to be inoperable while the battery charger is being repaired. The Required Action should be modified to assure the battery is not discharging and still has sufficient capacity to perform its design function within 2 hours. Allowing an inoperable battery for 24 hours (or 36 hours as proposed) cannot be technically justified.

Required Action A.1 and revised Required Action A.2 accomplish this. See response to comment #20.

20. Required Action A.2 [or (b)] of 3.8.4 serves no purpose. The Required Action should include a written requirement to restore battery float voltage to minimum float voltage recommended by the manufacturer within 12 hours.

Required Action A.2 of 3.8.4 has been revised based on comments from the TSTF that were approved by the IEEE. Revised Required Action A.2 requires verification that the battery terminal voltage is greater than or equal to the minimum required voltage to support operability of associated required loads within 2 hours and once per 12 hours thereafter.

21. Required Actions for Condition A of 3.8.4 should limit the time to reestablish a fully charged battery to 24 hours. The 24 plus 12 hours that appears to be permitted is not needed and is not justifiable.

In the revised Actions for 3.8.4, the licensee would have 12 hours to verify the battery's state of charge was sufficient to perform the design duty cycle. If the licensee could not complete that verification within 12 hours, Condition D would be entered, requiring a unit shutdown. If the licensee could verify the battery's state of charge was sufficient to perform the design duty cycle within 12 hours, then they would have 7 days to restore the battery charger.

22. Required Action A.3 of 3.8.4 serves no purpose. The Note with SR 3.8.6.1 states the SR is not applicable when battery float voltage is less than minimum design levels. The Required Action should include a written requirement to restore battery float current to less than 2 amps within 24 hours.

We agree that Required Action A.3 as originally proposed served no purpose. Required Action A.3 has been revised based on comments from the TSTF that were approved by the IEEE. Revised Required Action A.3 requires verification that the associated battery's state of charge is sufficient to perform the design duty cycle once per 12 hours.

23. Required Actions for Condition A of 3.8.4 should include a written requirement to restore battery float current to less than 10 amps withing 12 hours.

Required Action A.3 has been revised based on comments from the TSTF that were approved by the IEEE. Revised Required Action A.3 requires verification that the associated battery's state of charge is sufficient to perform the design duty cycle once per 12 hours.

24. Required Action A.1 of 3.8.6 serves no purpose. The Required Action should include a written requirement to verify battery float voltage to minimum float voltage recommended by the manufacturer within 2 hours.

Required Action A.1 requires performance of SR 3.8.4.1 within 2 hours. SR 3.8.4.1 requires verification that battery terminal voltage is greater than or equal to the minimum established float voltage. The phrase "recommended by the battery manufacturer" will be moved to the Bases based on a comment from the TSTF and approved by the IEEE that the phrase is excessive detail of how limits are established and is not reflective of the detail typically found in the STS. Also, the revised wording is consistent with that found in the 3.8.6 SRs. If terminal voltage were not within the limit of SR 3.8.4.1 then the licensee would enter Condition B of 3.8.6.

25. Required Action A.2 of 3.8.6 serves no purpose. The Required Action should include a written requirement to verify battery float to less than 2 amps within 2 hours.

Required Action A.2 requires performance of SR 3.8.6.1 within 2 hours. SR 3.8.6.1 requires verification that float current is between 0 amps and 2 amps. If float current were not in this range then the licensee would enter Condition B of 3.8.6.

26. Required Action C.2 of 3.8.6 serves no purpose. The Required Action should include a written requirement to verify voltage for affected cells is within the established design voltage limits within 2 hour and once per 12 hours thereafter for 7 days.

The TSTF commented that the Required Action C.2 should have read, "Perform SR 3.8.6.5 for affected cells." Requiring performance of SR 3.8.6.3 would be meaningless when already in the Actions for low electrolyte level. The IEEE

agreed with the TSTF and the correction has been made in the latest consolidated draft. The Completion Time is addressed in comment #7.

27. Condition B and C of 3.8.4 are the same.

Condition B is entered for an inoperable battery. Condition C is entered for a DC electrical power subsystem that is inoperable for a reason other than an inoperable charger or an inoperable battery.

Attachment 3
Final Draft STS 3.8.4, 3.8.5, and 3.8.6

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources – Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One [or two] battery charger[s on one train] inoperable.</p>	<p>28. Verify battery[ies] not discharging.</p> <p><u>AND</u></p> <p>29. Verify battery[ies] terminal voltage is greater than or equal to the minimum required voltage to support OPERABILITY of associated required loads.</p> <p><u>AND</u></p> <p>A.3 Verify associated battery[ies] state of charge is sufficient to perform the design duty cycle.</p> <p><u>AND</u></p> <p>A.4 Restore battery charger[s] to OPERABLE status.</p>	<p>2 hours</p> <p>2 hours and once per 12 hours thereafter</p> <p>Once per 12 hours</p> <p>7 days</p>
<p>B. One [or two] battery[ies on one train] inoperable.</p>	<p>B.1 Restore battery[ies] to OPERABLE status.</p>	<p>[2] hours</p>

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One DC electrical power subsystem inoperable for reasons other than Condition A or B.	C.1 Restore DC electrical power subsystem to OPERABLE status.	[2] hours
D. Required Action and associated Completion Time not met.	D.1 Be in MODE 3.	6 hours
	<u>AND</u> D.2 Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.4.1 Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	7 days

SURVEILLANCE	FREQUENCY
<p>SR 3.8.4.2 Verify each battery charger supplies \geq [400] amps at greater than or equal to minimum float voltage for \geq [4] hours.</p> <p><u>OR</u></p> <p>Verify each battery charger can recharge the battery to the fully charged state within [24] hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.</p>	<p>[18 months]</p>
<p>SR 3.8.4.3 -----NOTES-----</p> <ol style="list-style-type: none"> 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. 2. This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. <p>-----</p> <p>Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.</p>	<p>[18 months]</p>

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources – Shutdown

LCO 3.8.5 DC electrical power subsystem shall be OPERABLE to support the DC electrical power distribution subsystem(s) required by LCO 3.8.10, "Distribution Systems - Shutdown."

APPLICABILITY: MODES 5 and 6.
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One [or two] battery charger[s on one train] inoperable.</p>	<p>30. Verify battery[ies] not discharging.</p>	<p>2 hours</p>
	<p><u>AND</u></p>	
	<p>A.2 Verify battery[ies] terminal voltage is greater than or equal to the minimum required voltage to support OPERABILITY of associated required loads.</p>	<p>2 hours</p>
	<p><u>AND</u></p>	
	<p>A.3 Verify associated battery[ies] state of charge is sufficient to perform the design duty cycle.</p>	<p>Once per 12 hours</p>
	<p><u>AND</u></p>	
	<p>A.4 Restore battery charger[s] to OPERABLE status.</p>	<p>7 days</p>

(continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>B. One DC electrical power subsystem inoperable for reasons other than Condition A.</p>	<p>B.1 Declare affected required feature(s) inoperable.</p> <p><u>OR</u></p>	<p>Immediately</p>
	<p>B.2.1 Suspend CORE ALTERATIONS.</p> <p><u>AND</u></p>	<p>Immediately</p>
	<p>B.2.2 Suspend movement of irradiated fuel assemblies.</p> <p><u>AND</u></p>	<p>Immediately</p>
	<p>B.2.3 Initiate action to suspend operations involving positive reactivity additions.</p> <p><u>AND</u></p>	<p>Immediately</p>
	<p>B.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.5.1 -----NOTE----- The following SRs are not required to be performed: SR 3.8.4.2 and SR 3.8.4.3. ----- For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1, SR 3.8.4.2, and SR 3.8.4.3.</p>	<p>In accordance with applicable SRs</p>

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery Parameters

-----REVIEWER'S NOTE-----

The adoption of this specification is contingent upon implementation of a program to monitor battery parameters in accordance with IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

LCO 3.8.6 Battery parameters for the Train A and Train B batteries shall be within limits.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

-----NOTE-----

Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One or more batteries with one or more battery cell float voltages < [2.07] V.</p>	<p>A.1 Perform SR 3.8.4.1. <u>AND</u> A.2 Perform SR 3.8.6.1. <u>AND</u> A.3 Restore affected cell voltages to within limit.</p>	<p>2 hours 2 hours 24 hours</p>
<p>B. One or more batteries with float current \leq 0 amps or \geq 2 amps.</p>	<p>B.1 Restore battery float current to within limits.</p>	<p>24 hours</p>

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>-----NOTE----- Required Action C.2 shall be completed if electrolyte level was below the top of plates. -----</p> <p>C. One or more batteries with one or more cells electrolyte level less than minimum established design limits.</p>	<p>C.1 Restore electrolyte level to above top of plates.</p> <p><u>AND</u></p> <p>C.2 -----NOTE----- Only applicable if electrolyte level is below the top of plates. -----</p> <p>Perform SR 3.8.6.5 for affected cell(s).</p> <p><u>AND</u></p> <p>C.3 Restore electrolyte level to greater than or equal to minimum established design limits.</p>	<p>8 hours</p> <p>Once per 12 hours for 7 days</p> <p>31 days</p>
<p>D. One or more batteries with pilot cell electrolyte temperature less than minimum established design limits.</p>	<p>D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.</p>	<p>12 hours</p>

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>E. Required Actions and associated Completion Time of Condition A, B, C, or D not met.</p> <p><u>OR</u></p> <p>One or more batteries float current > 10 amps.</p>	<p>E.1 Declare associated battery inoperable.</p>	<p>Immediately</p>

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
<p>SR 3.8.6.1 -----NOTE----- Not required to be met when battery terminal voltage is less than the minimum float voltage recommended by the battery manufacturer. -----</p> <p>Verify each battery float current is > 0 amps and < [2] amps.</p>	7 days
<p>SR 3.8.6.2 Verify each battery pilot cell voltage is \geq [2.07] V.</p>	31 days
<p>SR 3.8.6.3 Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.</p>	31 days
<p>SR 3.8.6.4 Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.</p>	31 days
<p>SR 3.8.6.5 . Verify each battery connected cell voltage is \geq [2.07] V.</p>	92 days

SURVEILLANCE	FREQUENCY
<p>SR 3.8.6.6 -----NOTE----- This Surveillance shall not be performed in MODE 1, 2, 3, or 4. However, credit may be taken for unplanned events that satisfy this SR. ----- Verify battery capacity is \geq [80]% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.</p>	<p>60 months <u>AND</u> 12 months when battery shows degradation or has reached [85]% of the expected life with capacity < 100% of manufacturer's rating <u>AND</u> 24 months when battery has reached [85]% of the expected life with capacity \geq 100% of manufacturer's rating</p>