



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-295

ZION NUCLEAR POWER STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 93  
License No. DPR-39

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Commonwealth Edison Company (the licensee) dated June 28, 1985, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-39 is hereby amended to read as follows:

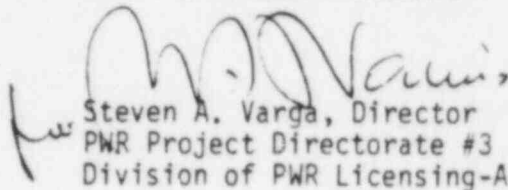
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(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 93, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Steven A. Varga, Director  
PWR Project Directorate #3  
Division of PWR Licensing-A

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 22, 1986



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-304

ZION NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 83  
License No. DPR-48

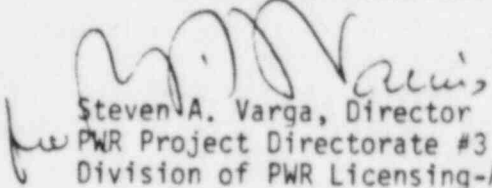
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Commonwealth Edison Company (the licensee) dated June 28, 1985, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-48 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 83, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
Steven A. Varga, Director  
PWR Project Directorate #3  
Division of PWR Licensing-A

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: January 22, 1986

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 93 FACILITY OPERATING LICENSE NO. DPR-39

AMENDMENT NO. 83 FACILITY OPERATING LICENSE NO. DPR-48

DOCKET NOS. 50-295 AND 50-304

Revise Appendix A as follows:

Remove Pages

iv  
295W  
295X  
295Y  
295Z  
295AA  
315  
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Insert Pages

iv  
295W  
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295Z  
295AA  
315  
295AA1  
295AA2  
295AA3  
295AA4  
295AA5  
295AA6  
295AA7  
295AA8  
295AA9

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LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT														
<p>3.22. Shock Suppressors (Snubbers)</p> <p>1. <u>Mechanical Snubbers</u></p> <p>A. All safety related mechanical snubbers listed in station procedures shall be OPERABLE.</p> <p><u>APPLICABILITY:</u> MODES 1,2,3,4 and 7</p> <p>(MODES 5 and 6 for snubbers located on systems required OPERABLE in those MODES.)</p> <p><u>ACTION:</u></p> <p>With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation per Specification 4.22.1.A.3 on the supported component or declare the supported system inoperable and follow the appropriate ACTION statement for that system.</p>	<p>4.22. Shock Suppressors (Snubbers)</p> <p>1. <u>Mechanical Snubbers</u></p> <p>A. Each mechanical snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program.</p> <p>1. <u>Visual Inspection - Mechanical Snubbers</u></p> <p>The visual inspection shall be performed in accordance with the following schedule.</p> <table data-bbox="1251 760 1979 1015"> <tr> <th>No. Inoperable Snubbers per Inspection Period</th><th>Subsequent Visual Inspection Period *#</th></tr> <tr> <td>0</td><td>18 months <math>\pm</math> 25%</td></tr> <tr> <td>1</td><td>12 months <math>\pm</math> 25%</td></tr> <tr> <td>2</td><td>6 months <math>\pm</math> 25%</td></tr> <tr> <td>3,4</td><td>124 days <math>\pm</math> 25%</td></tr> <tr> <td>5,6,7</td><td>62 days <math>\pm</math> 25%</td></tr> <tr> <td>8 or more</td><td>31 days <math>\pm</math> 25%</td></tr> </table> <p>The snubbers may be categorized into two groups: Those accessible and those inaccessible during reactor operation. Each group may be inspected independently in accordance with the above schedule.</p> <p>* The inspection interval shall not be lengthened more than one step at a time.</p> <p>* The provisions of Specification 4.0.2 are not applicable.</p>	No. Inoperable Snubbers per Inspection Period	Subsequent Visual Inspection Period *#	0	18 months $\pm$ 25%	1	12 months $\pm$ 25%	2	6 months $\pm$ 25%	3,4	124 days $\pm$ 25%	5,6,7	62 days $\pm$ 25%	8 or more	31 days $\pm$ 25%
No. Inoperable Snubbers per Inspection Period	Subsequent Visual Inspection Period *#														
0	18 months $\pm$ 25%														
1	12 months $\pm$ 25%														
2	6 months $\pm$ 25%														
3,4	124 days $\pm$ 25%														
5,6,7	62 days $\pm$ 25%														
8 or more	31 days $\pm$ 25%														

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p data-bbox="1072 299 1208 327">4.22.1.A.</p> <p data-bbox="1208 360 1889 422">2. <u>Visual Inspection Acceptance Criteria - Mechanical Snubbers</u></p> <p data-bbox="1285 455 1921 1103">Visual inspections shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are secure, and (3) in those locations where snubber movement can be manually induced without disconnecting the snubber, that the snubber has freedom of movement and is not frozen up. Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, providing that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible; and (2) the affected snubber is functionally tested in the as found condition and determined OPERABLE.</p> <p data-bbox="1208 1136 1874 1164">3. <u>Functional Tests - Mechanical Snubbers</u></p> <p data-bbox="1285 1197 1921 1496">At least once per 18 months during shutdown, a representative sample (10% of the total of each type of snubber in use in the plant) shall be functionally tested either in place or in a bench test. For each snubber that does not meet the functional test acceptance criteria of Specification 4.22.1.A.4, an additional 10% of that type of snubber shall be</p>



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**LIMITING CONDITIONS FOR OPERATION**

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**SURVEILLANCE REQUIREMENT**

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**4.22.1.A.3. (Continued)**

functionally tested.

The representative sample selected for functional testing shall include the various configurations, operating environments and the range of size and capacity of snubbers. At least 25% of the snubbers in the representative sample shall include snubbers from the following three categories:

- a. The first snubber away from each reactor vessel nozzle
- b. Snubbers within 5 feet of heavy equipment (valve, pump, turbine, motor, etc.)
- c. Snubbers within 10 feet of the discharge from a safety relief valve

Snubbers that are especially difficult to remove or in high radiation zones during shutdown shall also be included in the representative sample.\*

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- \* Permanent or other exemptions from functional testing for individual snubbers in these categories may be granted by the Commission only if justifiable basis for exemption is presented and/or snubber life destructive testing was performed to qualify snubber operability for all design conditions at either the completion of their fabrication or at a subsequent date.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p data-bbox="1081 305 1468 338">4.22.1.A.3. (Continued)</p> <p data-bbox="1293 371 1883 718">In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another position) and the spare snubber shall be retested. Test results of these snubbers may not be included for the re-sampling.</p> <p data-bbox="1293 743 1898 1115">If any snubber selected for functional testing either fails to lockup or fails to move, i.e., frozen in place, the cause will be evaluated and if caused by manufacturer or design deficiency, all snubbers of the same design subject to the same defect shall be functionally tested. This testing requirement shall be independent of the requirements stated above for snubbers not meeting the functional test acceptance criteria.</p> <p data-bbox="1293 1148 1898 1478">For the snubber(s) found inoperable, an engineering evaluation shall be performed on the components which are supported by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components supported by the snubber(s) were adversely affected by the inoperability of the snubber(s) in order to ensure that the supported component remains capable of meeting the designed service.</p>

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p>4.22.1.A. (Continued)</p> <p>4. <u>Functional Test Acceptance Criteria - Mechanical Snubbers</u></p> <p>The mechanical snubber functional test shall verify that:</p> <ul style="list-style-type: none"> <li>a. The force that initiates free movement of the snubber rod in either tension or compression is less than the specified maximum drag force. Drag force shall not have increased more than 50% since the last functional test.</li> <li>b. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.</li> <li>c. Snubber release rate, where required, is within the specified range in compression or tension. For snubbers specifically required not to displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.</li> </ul>

## LIMITING CONDITIONS FOR OPERATION

### 3.22. Shock Suppressors (Snubbers) (Continued)

#### 2. Hydraulic Snubbers

- A. All safety related hydraulic snubbers listed in station procedures shall be OPERABLE.

APPLICABILITY: MODES 1,2,3,4 and 7

(MODES 5 and 6 for snubbers located on systems required OPERABLE in those MODES.)

#### ACTION:

With one or more snubbers inoperable, within 72 hours replace or restore the inoperable snubber(s) to OPERABLE status and perform an engineering evaluation per Specification 4.22.2.A.3 on the supported component or declare the supported system inoperable and follow the appropriate ACTION statement for that system.

## SURVEILLANCE REQUIREMENTS

### 4.22. Shock Suppressors (Snubbers)

#### 2. Hydraulic Snubbers

- A. Each hydraulic snubber shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program.

##### 1. Visual Inspections - Hydraulic Snubbers

All hydraulic snubbers shall be visually inspected in accordance with the following schedule:

<u>No. Inoperable Snubbers per Inspection Period</u>	<u>Subsequent Visual Inspection Period *#</u>
0	18 months + 25%
1,2	12 months + 25%
3,4	6 months + 25%
5-8	124 days + 25%
9-14	62 days + 25%
15,16	31 days + 25%

The snubbers may be categorized into two groups: Those accessible and those inaccessible during reactor operation. Each group may be inspected independently in accordance with the above schedule.

- \* The inspection interval shall not be lengthened more than one step at a time.
- \* The provisions of Specification 4.0.2 are not applicable.

# LIMITING CONDITIONS FOR OPERATION

# SURVEILLANCE REQUIREMENT

## 4.22.2.A.

## Hydraulic Snubbers (Continued)

### 2. Visual Inspection Acceptance Criteria - Hydraulic Snubbers

Visual inspection shall verify (1) that there are no visible indications of damage or impaired OPERABILITY, (2) attachments to the foundation or supporting structure are secure, and (3) in those locations where snubber movement can be manually induced without disconnecting the snubber, that the snubber has freedom of movement and is not frozen up. Snubbers which appear inoperable as a result of visual inspections may be determined OPERABLE for the purpose of establishing the next visual inspection interval, providing that (1) the cause of the rejection is clearly established and remedied for that particular snubber and for other snubbers that may be generically susceptible; and (2) the affected snubber is functionally tested in the as found condition and determined OPERABLE. However, when the fluid port of a hydraulic snubber is found to be uncovered, the snubber shall be determined inoperable and cannot be determined OPERABLE via functional testing for the purpose of establishing the next visual inspection interval. All snubbers connected to an inoperable common hydraulic fluid reservoir shall be counted as inoperable snubbers.

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p data-bbox="1059 294 1449 327">4.22.2.A. (Continued)</p> <p data-bbox="1272 360 1910 426">3. <u>Functional Test - Hydraulic Snubbers (except large bore)</u></p> <p data-bbox="1349 450 1953 797">Once each refueling cycle, a representative sample of at least 10 hydraulic snubbers shall be functionally tested for operability including verification of proper piston movement, lock up and bleed. For each unit and subsequent unit found inoperable, an additional ten snubbers shall be so tested until no more failures are found or all units have been tested.</p> <p data-bbox="1349 826 1938 1073">The representative sample selected for functional testing shall include the various configurations, operating environments and the range of size and capacity of snubbers. At least 25% of the snubbers in the representative sample shall include snubbers from the following three categories:</p> <ul data-bbox="1349 1103 1921 1409" style="list-style-type: none"> <li>a. The first snubber away from each reactor vessel nozzle.</li> <li>b. Snubbers within 5 feet of heavy equipment (valve, pump, turbine, motor, etc.)</li> <li>c. Snubbers within 10 feet of the discharge from a safety relief valve.</li> </ul>

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p>4.22.2.A.3. (Continued)</p> <p>Snubbers that are especially difficult to remove or in high radiation zones during shutdown shall also be included in the representative sample.*</p> <p>In addition to the regular sample, snubbers which failed the previous functional test shall be retested during the next test period. If a spare snubber has been installed in place of a failed snubber, then both the failed snubber (if it is repaired and installed in another position) and the spare snubber shall be retested. Test results of these snubbers may not be included for the re-sampling.</p> <p>If any snubber selected for functional testing either fails to lockup or fails to move, i.e., frozen in place, the cause will be evaluated and if caused by manufacturer or design deficiency all snubbers of the same design subject to the same defect shall be functionally tested. This testing requirement shall be independent of the requirements stated above for snubbers not meeting the functional test acceptance criteria.</p> <p>For the snubber(s) found inoperable, an engineering evaluation shall be performed on the components which are supported</p>



LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p>4.22.2.A.3. (Continued)</p> <p>by the snubber(s). The purpose of this engineering evaluation shall be to determine if the components supported by the snubber(s) were adversely affected by the inoperability of the snubber(s) in order to ensure that the supported component remains capable of meeting the designed service.</p> <hr/> <p>* Permanent or other exemptions from functional testing for individual snubbers in these categories may be granted by the Commission only if a justifiable basis for exemption is presented and/or snubber life destructive testing was performed to qualify snubber operability for all design conditions at either the completion of their fabrication or at a subsequent date.</p> <p>4. <u>Large Bore Hydraulic Snubber - Functional Testing</u></p> <p>Once each refueling cycle, a representative sample of at least 1 Large Bore Hydraulic Snubber shall be functionally tested for operability including verification of proper piston movement, lock up and bleed.</p> <p>Large bore hydraulic snubbers have rated full load capacity of greater than 50,000 lbs.</p> <p>The representative sample selected for functional testing shall be a different steam generator snubber than has been previously functionally tested during this testing cycle.</p>



LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
	<p data-bbox="1072 277 1455 310">4.22.2.A.4. (Continued)</p> <p data-bbox="1285 342 1966 651">For snubber(s) found inoperable, an engineering evaluation shall be performed on components which are supported by the snubber(s). The purpose of the engineering evaluation shall be to determine if the components supported by the snubber(s) were adversely affected by the inoperability of the snubber(s) in order to ensure that the supported component remains capable of meeting the designed service.</p> <p data-bbox="1285 683 1966 805">For each unit and subsequent unit found inoperable, an additional two snubbers shall be so tested until no more failures are found or all units have been tested.</p> <p data-bbox="1208 837 1853 894">5. <u>Functional Test Acceptance Criteria - Hydraulic Snubber</u></p> <p data-bbox="1285 927 1944 984">The hydraulic snubber functional test shall verify that:</p> <ol style="list-style-type: none"> <li data-bbox="1285 1016 1944 1138">a. Activation (restraining action) is achieved within the specified range of velocity or acceleration in both tension and compression.</li> <li data-bbox="1285 1170 1944 1406">b. Snubber bleed, or release rate, where required, is within the specified range in compression or tension. For snubbers specifically required to not displace under continuous load, the ability of the snubber to withstand load without displacement shall be verified.</li> </ol>

LIMITING CONDITIONS FOR OPERATION	SURVEILLANCE REQUIREMENT
<p>4.22. Shock Suppressors (Continued)</p> <p>3. <u>Snubber Service Life Monitoring</u></p>	<p>4.22. Shock Suppressors (Continued)</p> <p>3. <u>Snubber Service Life Monitoring</u></p> <p>A record of the service life of each mechanical and hydraulic snubber, the date at which designated service life commences and the installation and maintenance records on which the designated service life is based shall be maintained. As required by Specification 6.5.B.16</p> <p>Concurrent with the first inservice visual inspection and at least once per 18 months thereafter, the installation and maintenance records for each snubber shall be reviewed to verify that the indicated service life has not been exceeded or will not be exceeded prior to the next scheduled snubber service life review. If the indicated service life will be exceeded prior to the next scheduled snubber service life review, the snubber service life shall be reevaluated or the snubber shall be replaced or reconditioned so as to extend its service life beyond the date of the next scheduled service life review. This reevaluation, replacement or reconditioning shall be indicated in the records.</p>

Bases: 3.22 & 4.22

Snubbers are designed to prevent unrestrained pipe motion under dynamic loads as might occur during an earthquake or, for some snubbers, severe transients, while allowing normal thermal motion during startup and shutdown. The consequences of an inoperable snubber is an increase in the probability of structural damage to piping as a result of a seismic event or, for some snubbers, other events initiating dynamic loads. It is therefore required that all snubbers required to protect the primary coolant system or any other safety system or component be operable during reactor operation.

Because the snubber protection is required only during low probability events, a period of 72 hours is allowed for repairs or replacements. In case a shutdown is required, the allowance of 4 hours to reach hot shutdown is consistent with standard operating procedures. After a maximum of 48 hours in hot shutdown, 24 hours is allowed to reach cold shutdown conditions. Since plant startup should not commence with knowingly defective safety-related equipment, Specifications 3.22.1 and 3.22.2 prohibit startup with inoperable snubbers.

All safety related hydraulic snubbers are visually inspected for overall integrity and operability. The inspection will include verification of proper orientation, adequate hydraulic fluid level and proper attachment of snubber to piping and structures.

The inspection frequency is based upon maintaining a constant level of snubber protection. Thus the required inspection interval varies inversely with the observed snubber failures. The number of inoperable snubbers found during a required inspection determines the time interval for the next required inspection. Inspections performed before that interval has elapsed may be used as a new reference point to determine the next inspection. However, the results of such early inspections performed before the original required time interval has elapsed (nominal time less 25%) may not be used to lengthen the required inspection interval. Any inspection whose results require a shorter inspection interval will override the previous schedule.

To further increase the assurance of snubber reliability, functional tests should be performed once each refueling cycle. These tests will include stroking of the snubbers to verify proper piston movement, lockup and bleed. Ten snubbers represents an adequate sample for such tests. Observed failures on these samples should require testing of additional units. To minimize personnel exposures, snubbers installed in high radiation zones during reactor shutdown or in especially difficult to remove locations may be exempted from these functional testing requirements provided a permanent exemption is obtained from the Commission.

Bases: 3.22 & 4.22 (Continued)

Experience at operating facilities has shown that the required surveillance program should assure an acceptable level of snubber performance provided that the seal materials are compatible with the operating environment.

Snubbers containing seal material which has not been demonstrated by operating experience, lab tests or analysis to be compatible with the operating environment should be inspected more frequently (every month) until materials compatibility is confirmed or an appropriate changeout is completed.

Examination of defective snubbers at reactor facilities and material tests performed at several laboratories (Reference 1) has shown that millable gum polyurethane deteriorates rapidly under the temperature and moisture conditions present in many snubber locations. Although molded polyurethane exhibits greater resistance to these conditions, it also may be unsuitable for application in the higher temperature environments. Data are not currently available to precisely define an upper temperature limit for the molded polyurethane. Lab tests and in-plant experience indicate that seal materials are available, primarily ethylene propylene.

Snubbers may be added to safety related systems without prior license amendment provided they are added to station procedures and documented in accordance with 10 CFR 50.59.

Hydraulic snubbers and mechanical snubbers may each be treated as a different entity for the above surveillance programs.

The service life of a snubber is evaluated via manufacturer input and information through consideration of the snubber service conditions and associated installation and maintenance records (newly installed snubber, seal replaced, spring replaced, in high radiation area, in high temperature area, etc...). The requirement to monitor the snubber service life is included to ensure that the snubbers periodically undergo a performance evaluation in view of their age and operating conditions. These records will provide statistical bases for future consideration of snubber service life. The requirements for the maintenance of records and the snubber service life review are not intended to affect plant operation.

(1) Report H. R. Erickson, Bergen Paterson to K. R. Goller, NRC, October 7, 1974

## 6.5 Records (Continued)

- B. Records and/or logs relative to the following items shall be recorded in a manner convenient for review and shall be retained for the life of the plant.
1. Substitution or replacement of principal items of equipment pertaining to nuclear safety.
  2. Changes made to the plant as it is described in the Safety Analysis Report.
  3. Records of new and spent fuel inventory and assembly histories.
  4. (Deleted)
  5. Updated, corrected, and as-built drawings of the plant.
  6. Records of plant radiation and contamination surveys.
  7. Records of off-site environmental monitoring surveys.
  8. Records of radiation exposure for all plant personnel, including all contractors and visitors to the plant in accordance with 10 CFR 20.
  9. Records of radioactivity in liquid and gaseous wastes released to the environment.
  10. Records of transient or operational cycling for those components that have been designed to operate safely for a limited number of transient or operational cycles.
  11. Records of individual qualifications, experience, training and retraining.
  12. Inservice inspections of the reactor coolant system.
  13. Minutes of meetings and results of reviews performed by the off-site and on-site review functions.
  14. Records of secondary water sampling and water quality.
  15. Records for Environmental Qualification which are covered under the provisions of paragraph 6.6.3.d.
  16. Records of the service lives of all snubbers covered by Specification 3.22 including the date at which the service life commences and associated installation and maintenance records.