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

August 29, 1986

Docket No. 50-374

Mr. Dennis L. Farrar
Director of Licensing
Commonwealth Edison Company
P.O. Box 767
Chicago, Illinois 60690

Dear Mr. Farrar:

Subject: Issuance of Amendment No. 25 to Facility Operating License No. NPF-18 - La Salle County Station, Unit 2

The Nuclear Regulatory Commission has issued the enclosed Amendment No. 25 to Facility Operating License No. NPF-18 for the La Salle County Station, Unit 2. This amendment is in response to your letter dated June 11, 1986.

This amendment revises the La Salle Unit 2 Technical Specifications since you are now replacing the eight 26-inch and two 8-inch vent and purge isolation valves with valves manufactured by Clow Corporation which meet all the requirements for containment vent and purge isolation valves, and satisfies License Condition 2.C.(8).

A copy of the related safety evaluation supporting Amendment No.25 to Facility Operating License No. NPF-18 is enclosed.

Sincerely,

Elinor G. Adensam

Elinor G. Adensam, Director
BWR Project Directorate No. 3
Division of BWR Licensing

Enclosures:
1. Amendment No. 25 to NPF-18
2. Safety Evaluation

cc w/enclosure:
See next page

DESIGNATED ORIGINAL

Certified By

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Mr. Dennis L. Farrar
Commonwealth Edison Company

La Salle County Nuclear Power Station
Units 1 & 2

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AMENDMENT NO. 25 TO FACILITY OPERATING LICENSE NO. NPF-18 - LA SALLE, UNIT 2

DISTRIBUTION:

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

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-374

LA SALLE COUNTY STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 25
License No. NPF-18

1. The Nuclear Regulatory Commission (the Commission or the NRC) having found that:

   A. The application for amendment filed by the Commonwealth Edison Company (the licensee), dated June 11, 1986, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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 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 set forth in 10 CFR Chapter I;

   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 enclosure to this license amendment and paragraph 2.C.(2) of the Facility Operating License No. NPF-18 is hereby amended to read as follows:

   (2) Technical Specifications and Environmental Protection Plan

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 25, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

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3. This amendment is effective upon startup following the first refueling.

FOR THE NUCLEAR REGULATORY COMMISSION

Elinor G. Adensam

Elinor G. Adensam, Director
BWR Project Directorate No. 3
Division of BWR Licensing

Enclosure:
Changes to the Technical
Specifications

Date of Issuance: August 29, 1986

ENCLOSURE TO LICENSE AMENDMENT NO. 25

FACILITY OPERATING LICENSE NO. NPF-18

DOCKET NO. 50-374

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain a vertical line indicating the area of change.

REMOVE	INSERT
3/4 6-18	3/4 6-18
3/4 6-28	3/4 6-28
3/4 6-37	3/4 6-37
3/4 8-27	3/4 8-27
3/4 8-28	3/4 8-28
3/4 8-29	3/4 8-29
3/4 8-30	3/4 8-30
B 3/4 6-2	B 3/4 6-2

DRYWELL AND SUPPRESSION CHAMBER PURGE SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.1.8 The drywell and suppression chamber purge system may be in operation with the drywell and/or suppression chamber purge supply and exhaust butterfly isolation valves open for inerting, deinerting, and pressure control. Purging through the Standby Gas Treatment System shall be restricted to less than or equal to 90 hours per 365 days.

APPLICABILITY: OPERATIONAL CONDITIONS 1, 2, and 3.

ACTION:

With a drywell and/or suppression chamber purge supply and/or exhaust butterfly isolation valve open for other than inerting, deinerting, or pressure control, close the butterfly valve(s) within 1 hour or be in at least HOT SHUTDOWN within the next 12 hours and in COLD SHUTDOWN within the following 24 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.8.1 The cumulative time that the drywell and suppression chamber purge system has been in operation purging through the Standby Gas Treatment System shall be verified to be less than or equal to 90 hours per 365 days prior to use in this mode of operation.

TABLE 3.6.3-1 (Continued)

PRIMARY CONTAINMENT ISOLATION VALVES

VALVE FUNCTION AND NUMBER	VALVE GROUP[a]	MAXIMUM ISOLATION TIME (Seconds)
Automatic Isolation Valves (Continued)		
8. Containment Vent and Purge Valves	4	
2VQ026		≤ 10
2VQ027		≤ 10
2VQ029		≤ 10
2VQ030		≤ 10
2VQ031		≤ 10
2VQ032		≤ 5
2VQ034		≤ 10
2VQ035		≤ 5
2VQ036		≤ 10
2VQ040		≤ 10
2VQ042		≤ 10
2VQ043		≤ 10
2VQ047		≤ 5
2VQ048		≤ 5
2VQ050		≤ 5
2VQ051		≤ 5
2VQ068		≤ 5
9. RCIC Turbine Exhaust Vacuum Breaker Line Valves	9	N.A.
2E51-F080		
2E51-F086		
10. LPCS, HPCS, RCIC, RHR Injection Testable Check Bypass Valves[g]	N.A.	N.A.

TABLE 3.6.3-1 (Continued)

PRIMARY CONTAINMENT ISOLATION VALVES

VALVE FUNCTION AND NUMBER

Other Isolation Valves (Continued)

7. Post LOCA Hydrogen Control

   2HG001A, B
   2HG002A, B
   2HG005A, B
   2HG006A, B

8. Standby Liquid Control System

   2C41-F004A, B
   2C41-F007

9. Reactor Recirculation Seal Injection

   2B33-F013A, B(j)
   2B33-F017A, B(j)

10. Drywell Pneumatic Valves

    2IN018

TABLE NOTATIONS

*But > 3 seconds.

(a) See Specification 3.3.2, Table 3.3.2-1, for isolation signal(s) that operates each valve group.
(b) Not included in total sum of Type B and C tests.
(c) May be opened on an intermittent basis under administrative control.
(d) Not closed by SLCS actuation.
(e) Not closed by Trip Functions 5a, b, or c, Specification 3.3.2, Table 3.3.2-1.
(f) Not closed by Trip Functions 4a, c, d, e, or f of Specification 3.3.2, Table 3.3.2-1.
(g) Not subject to Type C leakage test.
(h) Opens on an isolation signal. Valves will be open during Type A test. No Type C test required.
(i) Also closed by drywell pressure-high signal.
(j) Hydraulic leak test at 43.6 psig.
(k) Not subject to Type C leakage test - leakage rate tested per Specification 4.4.3.2.2.
(l) These penetrations are provided with removable spools outboard of the outboard isolation valve. During operation, these lines will be blind flanged using a double O-ring and a type B leak test. In addition, the packing of these isolation valves will be soap-bubble tested to ensure insignificant or no leakage at the containment test pressure each refueling outage.

TABLE 3.8.3.3-1

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

	VALVE NUMBER	BYPASS DEVICE (Continuous)(Accident Conditions)	SYSTEM(S) AFFECTED
a.	1VG001	Accident Conditions	SBGTS
	1VG003	Accident Conditions	
	2VG001	Accident Conditions	
	2VG003	Accident Conditions	
b.	2VP113A	Accident Conditions	Primary containment chilled water coolers
	2VP113B	Accident Conditions	
	2VP114A	Accident Conditions	
	2VP114B	Accident Conditions	
	2VP053A	Accident Conditions	
	2VP053B	Accident Conditions	
	2VP063A	Accident Conditions	
	2VP063B	Accident Conditions	
c.	2VQ038	Accident Conditions	Primary containment vent and purge system
	2VQ032	Accident Conditions	
	2VQ035	Accident Conditions	
	2VQ047	Accident Conditions	
	2VQ048	Accident Conditions	
	2VQ050	Accident Conditions	
	2VQ051	Accident Conditions	
	2VQ068	Accident Conditions	
	2VQ037	Accident Conditions	
d.	2WR179	Accident Conditions	RBCCW system
	2WR180	Accident Conditions	
	2WR040	Accident Conditions	
	2WR029	Accident Conditions	
e.	2B21 - F067A	Accident Conditions	Main steam system
	2B21 - F067B	Accident Conditions	
	2B21 - F067C	Accident Conditions	
	2B21 - F067D	Accident Conditions	
	2B21 - F019	Accident Conditions	
	2B21 - F016	Accident Conditions	
	2B21 - F020	Continuous	
	2B21 - F068	Continuous	
	2B21 - F070	Continuous	
	2B21 - F069	Continuous	
	2B21 - F071	Continuous	
	2B21 - F072	Continuous	
	2B21 - F073	Continuous	
f.	2B21 - F065A	Continuous	Main feedwater system
	2B21 - F065B	Continuous	

TABLE 3.8.3.3-1 (Continued)

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

	VALVE NUMBER	BYPASS DEVICE (Continuous)(Accident Conditions)	SYSTEM(S) AFFECTED
g.	2E21 - F001	Continuous	LPCS system
	2E21 - F005	Accident Conditions	
	2E21 - F011	Accident Conditions	
	2E21 - F012	Accident Conditions	
h.	2C41 - F001A	Accident Conditions	SBLCS
	2C41 - F001B	Accident Conditions	
i.	2G33 - F001	Accident Conditions	RWCU
	2G33 - F004	Accident Conditions	
j.	2E12 - F052A	Accident Conditions	RHR system
	2E12 - F064A	Accident Conditions	
	2E12 - F087A	Accident Conditions	
	2E12 - F004A	Continuous	
	2E12 - F047A	Continuous	
	2E12 - F048A	Accident Conditions	
	2E12 - F003A	Continuous	
	2E12 - F026A	Accident Conditions	
	2E12 - F068A	Continuous	
	2E12 - F073A	Continuous	
	2E12 - F074A	Continuous	
	2E12 - F011A	Accident Conditions	
	2E12 - F024A	Accident Conditions	
	2E12 - F016A	Accident Conditions	
	2E12 - F017A	Accident Conditions	
	2E12 - F027A	Accident Conditions	
	2E12 - F004B	Continuous	
	2E12 - F047B	Continuous	
	2E12 - F048B	Accident Conditions	
	2E12 - F003B	Continuous	
	2E12 - F068B	Continuous	
	2E12 - F073B	Continuous	
	2E12 - F074B	Continuous	
	2E12 - F026B	Accident Conditions	
	2E12 - F011B	Accident Conditions	
j.	2E12 - F024B	Accident Conditions	RHR system
	2E12 - F006B	Continuous	
	2E12 - F016B	Accident Conditions	
	2E12 - F017B	Accident Conditions	
	2E12 - F042B	Accident Conditions	
	2E12 - F064B	Accident Conditions	
	2E12 - F093	Continuous	
	2E12 - F021	Accident Conditions	
	2E12 - F004C	Continuous	
	2E12 - F052B	Accident Conditions	
	2E12 - F087B	Accident Conditions	

TABLE 3.8.3.3-1 (Continued)

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

	VALVE NUMBER	BYPASS DEVICE (Continuous)(Accident Conditions)	SYSTEM(S) AFFECTED
	2E12 - F099B	Accident Conditions	
	2E12 - F099A	Accident Conditions	
	2E12 - F008	Accident Conditions	
	2E12 - F009	Accident Conditions	
	2E12 - F040A	Accident Conditions	
	2E12 - F040B	Accident Conditions	
	2E12 - F049A	Accident Conditions	
	2E12 - F049B	Accident Conditions	
	2E12 - F053A	Accident Conditions	
	2E12 - F053B	Accident Conditions	
	2E12 - F006A	Continuous	
	2E12 - F023	Accident Conditions	
	2E12 - F027B	Accident Conditions	
	2E12 - F042A	Accident Conditions	
	2E12 - F042C	Accident Conditions	
	2E12 - F064C	Accident Conditions	
	2E12 - F094	Continuous	
k.	2E51 - F086	Accident Conditions	RCIC system
	2E51 - F022	Accident Conditions	
	2E51 - F068	Continuous	
	2E51 - F069	Continuous	
	2E51 - F080	Accident Conditions	
	2E51 - F046	Accident Conditions	
	2E51 - F059	Accident Conditions	
	2E51 - F063	Accident Conditions	
	2E51 - F019	Accident Conditions	
	2E51 - F031	Continuous	
	2E51 - F045	Accident Conditions	
	2E51 - F008	Accident Conditions	
	2E51 - F010	Accident Conditions	
	2E51 - F013	Accident Conditions	
	2E51 - F064	Accident Conditions	
	2E51 - F076	Accident Conditions	
l.	2E32 - F001A	Accident Conditions	MSIV-LCS
	2E32 - F002A	Accident Conditions	
	2E32 - F003A	Accident Conditions	
	2E32 - F001E	Accident Conditions	
	2E32 - F002E	Accident Conditions	
	2E32 - F003E	Accident Conditions	
	2E32 - F001J	Accident Conditions	
	2E32 - F002J	Accident Conditions	
	2E32 - F003J	Accident Conditions	
	2E32 - F001N	Accident Conditions	
	2E32 - F002N	Accident Conditions	

TABLE 3.8.3.3-1 (Continued)

MOTOR OPERATED VALVES THERMAL OVERLOAD PROTECTION

	VALVE NUMBER	BYPASS DEVICE (Continuous)(Accident Conditions)	SYSTEM(S) AFFECTED
	2E32 - F003N	Accident Conditions	
	2E32 - F006	Accident Conditions	
	2E32 - F007	Accident Conditions	
	2E32 - F008	Accident Conditions	
	2E32 - F009	Accident Conditions	
m.	2E22 - F001	Accident Conditions	HPCS system
	2E22 - F004	Accident Conditions	
	2E22 - F010	Accident Conditions	
	2E22 - F011	Accident Conditions	
	2E22 - F012	Accident Conditions	
	2E22 - F015	Accident Conditions	
	2E22 - F023	Accident Conditions	

3/4.6.1.5 PRIMARY CONTAINMENT STRUCTURAL INTEGRITY

This limitation ensures that the structural integrity of the containment will be maintained comparable to the original design standards for the life of the facility. Structural integrity is required to ensure that the containment will withstand the maximum pressure of 45 psig in the event of a LOCA. The measurement of containment tendon lift-off force, the tensile tests of the tendon wires or strands, the visual examination of tendons, anchorages and exposed interior and exterior surfaces of the containment, the chemical and visual examination of the sheathing filler grease, and the Type A leakage test are sufficient to demonstrate this capability.

The surveillance requirements for demonstrating the primary containment's structural integrity and the method of predicting the prestress losses are in compliance with the recommendations of Regulatory Guide 1.35, "Inservice Inspection of Ungrouted Tendons in Prestressed Concrete Containment Structures," January 1976, and proposed Regulatory Guide 1.35.1, "Determining Prestressing Forces for Inspection of Prestressed Concrete Containment Structures," April 1979 with the following clarification: the tested lift-off force of individual tendon tension shall be greater than or equal to the initial prestress minus the losses, as predicted in the as-built design, which occur between the initial pre-operational structural integrity test and the time of subsequent surveillance.

The required Special Reports from any engineering evaluation of containment abnormalities shall include a description of the tendon condition, the condition of the concrete (especially at tendon anchorages), the inspection procedure, the tolerances on cracking, the results of the engineering evaluation, and the corrective action taken.

3/4.6.1.6 DRYWELL AND SUPPRESSION CHAMBER INTERNAL PRESSURE

The limitations on drywell and suppression chamber internal pressure ensure that the containment peak pressure of 39.6 psig does not exceed the design pressure of 45 psig during LOCA conditions or that the external pressure differential does not exceed the design maximum external pressure differential of 5 psid. The limit of 2.0 psig for initial positive primary containment pressure will limit the total pressure to 39.6 psig which is less than the design pressure and is consistent with the safety analysis.

3/4.6.1.7 DRYWELL AVERAGE AIR TEMPERATURE

The limitation on drywell average air temperature ensures that the containment peak air temperature does not exceed the design temperature of 340°F during LOCA conditions and is consistent with the safety analysis.

3/4.6.1.8 DRYWELL AND SUPPRESSION CHAMBER PURGE SYSTEM

The drywell and suppression chamber purge supply and exhaust isolation valves are required to be closed during plant operation except as required for inerting, de-inerting and pressure control. These valves have been demonstrated capable of closing during a LOCA or steam line break accident from the full open position.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 25 TO FACILITY OPERATING LICENSE NO. NPF-18

COMMONWEALTH EDISON COMPANY

LA SALLE COUNTY STATION, UNIT 2

DOCKET NO. 50-374

1.0 INTRODUCTION

In Supplement No. 7 to the La Salle Safety Evaluation Report and License Condition 2.C.(8), we concluded that interim operation was allowed for La Salle Unit 2 since the licensee committed to replace the two 8-inch and eight 26-inch valves used in containment isolation valves prior to startup after the first refueling. These valves have closure times of 40 seconds which are greater than the 15 seconds approved by the staff. In addition these valves were blocked from opening greater than 50 degrees since these valves were not qualified to close from a complete open position during a design basis accident of loss-of-coolant or steam line break. Demonstration of operability is necessary to assure containment isolation. This demonstration of operability is required by Branch Technical Position (BTP), Containment System Branch (CSB), 6-4 and Standard Review Plan 3.10 for these containment purge and vent valves which are not sealed closed during all operational modes.

The vent valves identified as the containment isolation valves in the purge and vent system are as follows:

Valve Number Unit 2	Size (Inches)	Function	Location
2VQ026	26	Intake	Outside Containment
2VQ027	26	Intake	Outside Containment
2VQ029	26	Intake	Outside Containment
2VQ030	26	Intake	Outside Containment
2VA031	26	Exhaust	Outside Containment
2VQ034	26	Exhaust	Outside Containment
2VQ036	26	Exhaust	Outside Containment
2VQ040	26	Exhaust	Outside Containment
2VQ042	8	Intake	Outside Containment
2VQ043	8	Intake	Outside Containment
2VQ032	2	Bypass	Outside Containment
2VQ035	2	Bypass	Outside Containment
2VQ047	2	Bypass	Outside Containment
2VQ048	2	Bypass	Outside Containment
2VQ050	2	Bypass	Outside Containment
2VQ051	2	Bypass	Outside Containment
2VQ068	2	Bypass	Outside Containment

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The 8-inch and 26-inch valves are being replaced by Tricentric Butterfly Valves which are manufactured by the Clow Corporation. These valves are equipped with air open-spring close actuators manufactured by Bettis. Model Number NT820-SR3 actuators are installed on the 26-inch valves and NT312-SR3 actuators on the 8-inch valves.

2.0 EVALUATION

The licensee, in its application dated June 11, 1986, indicated that the two 8-inch and the eight 26-inch vent and purge valves are being replaced by high performance air operated butterfly valves which have closure times of equal or less than 10 seconds. In addition these valves are qualified to close from any position including the full open (90°) position.

The purge and vent valves to be installed at La Salle Unit 2 are qualified by a combination of test and analysis found in Clow Corporation Report No. 7-25-85 entitled "Purge and Vent Operability Qualification Analysis." Tests were initially performed for 12, 24, 48, and 96-inch scale model valves (scaled to 3-inch pipe size) in a straight run of pipe for both choked and unchoked flow conditions to determine the mass flow and aerodynamic torque characteristics. The obtained data were evaluated and subsequently a computer program*, CVAP, was developed using the measured data base to predict flow and torque values for full size valves in a straight run of pipe. To address the concerns regarding the effect that the upstream configuration would have on the dynamic torque characteristics, a second series of model tests and analyses were performed to determine how the aerodynamic torque characteristics of the Clow valves varied with installed piping conditions such as elbows, tees and reducers. The results of these tests and analyses demonstrated that the upstream elbow effects on the torque characteristics diminished significantly at a distance of 4 pipe diameters and were barely detectable at a distance of 8 diameters.

To substantiate the mode tests and analysis, a full size 12-inch valve assembly operational test under choked flow conditions was performed. The test results showed that the valve would operate under the choked flow conditions, that mass flows were as predicted, and that use of the CVAP program to predict torques was conservative. The peak measured torque was approximately 65% of the predicted value.

In the analysis and test performed, the following assumptions have been employed to indicate the conservative approach toward demonstrating operability:

- Containment pressure is at a maximum value and full flow has been developed prior to initiation of valve closure.

*See Attachment 1.

- The pressure downstream of the valve is atmospheric.
- Worst case upstream piping configuration (mitered elbow worse than radius elbow) and distance considered.
- Torque coefficients used in the CVAP program are worst case values.
- Scaling of torques to larger size values by the D^3 method may be largely conservative as shown by test on 12-inch valve (Vought test).

The methods utilized have been reviewed and are found acceptable to the staff.

Review of the stress analysis (using the ANSYS finite element computer program) for the critical parts of the valve assembly reveals ample margin between the code allowables and the projected values. The elements considered in the Qualification Report, Design Report, and the Structural Analysis Report are summarized in Tables 1 and 2. An additional conservatism in the analysis is the 45 psid pressure assumed across the valve.

The Bettis actuators are shown in the submittal to have a maximum spring torque at 90° full open positive. For valve V0031, the aerodynamic torques for the first 3° to 5° from full open resist closure. However, for all valves a positive torque margin exists i.e., actuator torque delivered is greater than any of the forces resisting closure.

In addition, these new Clow valves do not contain resilient seals; and therefore, the once per 92 days leakage surveillance is no longer required. Also, since these valves are air-operated no thermal overload bypass functions are required.

In view of the above, the staff finds the information submitted has demonstrated the ability of the valves to close against the buildup of containment pressure in the event of a design basis accident. Therefore, Technical Specifications 3.6.1.8, 4.6.1.8 and associated basis 3/4.6.1.8 can be revised to remove the 50° limit on valve opening. In addition, Technical Specification 4.6.1.8.2 is deleted and Technical Specification 3.8.3.3 is revised to delete these valves from Table 3.8.3.3-1 since these valves do not contain resilient seals and are air-operated. With respect to adding these valves at the first refueling outage, this is in accordance with the license condition.

3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves a change in the installation and use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes in surveillance requirements. The staff has determined that this amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards

consideration and there has been no public comment on such finding. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

4.0 CONCLUSION

The Commission made a proposed determination that the amendment involves no significant hazards consideration which was published in the Federal Register (51 FR 27279) on Wednesday, July 30, 1986, and consulted with the state of Illinois. No public comments were received, and the state of Illinois did not have any comments.

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (2) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: A. Bournia, BWR Project Directorate No. 3, DBL

Dated: August 29, 1986

Table 1. Summary of Allowable Stresses, 26-inch Valve (Loads per Generic Report)

Location	Material	Allowable Stress (psi)[1]	Stress Value (psi)
Valve Body	SA 516 GR.70	17500	6703
Disc	SA 516 GR.70	17500	3540
Drive Shaft	SA 564 Type 630 H-1100	34500	3044
Operator Adapter Plate	SA 516 GR.70	31500[2] 34200[3]	29120
Adapter Plate Bolts (7 g)	SA 193 GR.B7	25000	29120 σ_n 20736 τ
Cover Plate	SA 516 GR.70	17500	5807
Cover Plate Bolts	SA 193 GR.B7	25000	12276 σ_n 172 τ

[1]Per ASME Section III, Tables I-7.1 - I-7.3 (for 7.0 g seismic load).
[2]Per ASME, Section III, Subsection NC, Article NC3520.
[3]Evaluated Against $.9\sigma_y$.

Table 2. Summary of Allowable Stresses, 6-inch Valve (Loads per Generic Report)

Location	Material	Allowable Stress (psi)[1]	Stress Value (psi)
Valve Body	SA 516 GR.70	17500	7088
Disc	SA 516 GR.70	17500	6767
Drive Shaft	SA 564 Type 630 H-1100	34550	27610
Operator Adapter Plate	SA 516 GR.70	1 (ASME "S") = 17500	2718 σ_m
		1.5 (ASME "S") = 26250	25313 σ_{m+b}
Adapter Plate Bolts (7 g)	SA 193 GR.B7	25000	55374 σ_N 20602 τ
Cover Plate	SA 516 GR.70	17500	30
Cover Plate Bolts	SA 193 GR.B7	25000	4195 σ_N 172 τ

[1]Per ASME Section III, Tables I-7.1 - I-7.3 (for 7.0 g seismic load).

[2]Although the stresses for the adaptor plate bolts shown in column four of the table are higher than the allowable stress values shown in column three, the bolt stresses are within the ASME Code limits as specified in ASME Section III, Appendix XVII, Subarticle 2460. The allowable bolt stresses per Appendix XVII are based on the ultimate tensile strength of the material as shown in Appendix I, Table I-7.3. The ultimate tensile strength of SA 193 GR.B7 material is 125,000 psi as compared to a 25,000 psi allowable stress.

Attachment 1

Using model test data, dynamic torques are calculated by a computer program, Clow Valve Analysis Program (CVAP), developed for use in predicting valve operating characteristics. In the computer program, mass flow rates are predicted by standard equations for flow through an ideal converging nozzle adjusted with coefficients developed in the tests. Torques are predicted on the basis of the equation:

$$T = C_T \Delta P D_V^3$$

where:

T	=	predicted aerodynamic torque (in-lb)
C_T	=	torque coefficient developed in model tests
ΔP	=	pressure differential across the valve (lb-in^2)
D_V	=	nominal valve diameter (in).

The power of three used in the equation and the CVAP program is a derived value obtained by use of the equations for a general control volume. A test performed on a full size 12-inch valve indicated that torques were approximately 65% of the values obtained for the same valve from the CVAP program, thus demonstrating additional conservatism in the analysis.