



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

October 16, 1990

MEMORANDUM FOR: James M. Taylor  
Executive Director for Operations

FROM: Edward L. Jordan, Chairman  
Committee to Review Generic Requirements

SUBJECT: MINUTES OF CRGR MEETING NUMBER 191

The Committee to Review Generic Requirements (CRGR) met on Friday, September 14, 1990 from 10:00 a.m.-3:00 p.m. A list of attendees at the meeting is enclosed (Enclosure 1). The following items were discussed at the meeting:

1. J. Richardson, L. B. Marsh, E. Sullivan and T. Scarborough of NRR presented for CRGR review a proposed Supplement 3 to Generic Letter 89-10 on motor operated valves. The supplement would request that licensees consider problems found in NRC sponsored tests of certain valves and address any affected valves on a priority basis within the overall MOV testing program. The Committee supported the concept of requesting expedited action and provided a number of comments. The staff agreed to provide a redrafted letter for CRGR review. The CRGR review would be completed by negative consent, if possible. This matter is discussed in Enclosure 2.
2. R. Bosnak and J. Vora of RES and W. Travers, J. Craig and J. Thoma of NRR presented for CRGR review a proposed regulatory guide on standard format and content for license renewal and a proposed standard review plan for license renewal. The Committee recommended in favor of the proposed documents. The Committee provided a number of comments which the staff agreed to consider. No coordination with the CRGR staff or re-review by the CRGR was requested. This matter is discussed in Enclosure 3.

In accordance with the EDO's July 18, 1983 directive concerning "Feedback and Closure of CRGR Reviews," a written response is required from the cognizant office to report agreement or disagreement with CRGR recommendations in these minutes. The response, which is required within five working days after receipt of these minutes, is to be forwarded to the CRGR Chairman and if there is disagreement with CRGR recommendations, to the EDO for decisionmaking.

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James M. Taylor

Questions concerning these meeting minutes should be referred to Dennis Allison (492-4148).

Original Signed by:  
E. L. Jordan

Edward L. Jordan, Chairman  
Committee to Review Generic  
Requirements

Enclosures:  
As stated

cc w/enclosures:  
Commission (5)  
SECY  
J. Lieberman  
P. Norry  
D. Williams  
Regional Administrators  
CRGR Members

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L. Marsh E. Sullivan  
T. Scarborough R. Bosnak  
L. Shao J. Varga  
J. Thoma D. Ross  
E. Jordan J. Conran  
D. Allison

OFC : CRGR/AEOD	: DO: AEOD	: C/CRGR/AEOD	:	:	:
NAME : DA Allison: sm	: DRoss	: EJordan	:	:	:
DATE : 10/16/90	: 10/16/90	: 10/16/90	:	:	:

ATTENDANCE LIST

CRGR Meeting No. 191

September 14, 1990

CRGR Members

E. Jordan  
G. Arlotto  
J. Moore  
F. Miraglia  
B. Sheron  
L. Reyes

CRGR Staff

J. Conran  
D. Allison

NRC Staff

W. Minners  
J. Richardson  
L. Marsh  
E. Sullivan  
T. Scarborough  
R. Bosnak  
J. Vora  
J. Craig  
J. Thoma  
M. Davis  
M. Taylor  
C. Thompson  
F. Gurbelich  
A. Gody  
G. Weidenhamer  
R. Kiessel  
O. Rothberg  
F. Akstulewicz  
G. Mizuno  
P. T. Kuo  
R. Anand  
R. Borchardt  
D. Jackson  
E. Doolittle  
J. Murphy

Enclosure 2 to the Minutes of CRGR Meeting No. 191  
Proposed Supplement 3 to Generic Letter 89-10  
on Motor Operated Valve Testing

September 14, 1990

TOPIC

J. Richardson, L. B. Marsh, E. Sullivan and T. Scarborough presented for CRGR review a proposed Supplement 3 to Generic Letter 89-10 on Motor Operated Valves. The supplement would request that licensees consider problems found in NRC-sponsored tests of certain valves and address any affected valves on a priority basis within the overall MOV testing program that was being conducted under Generic Letter 89-10.

In pursuing resolution of Generic Issue 87, "Failure of HPCI Without Isolation," the NRC has sponsored tests on 6- and 10-inch gate valves typically used to perform containment isolation in the steam supply lines to HPCI and RCIC systems and in the water supply line to the RWCU system in BWR's. The results indicated that the thrust required to close the valves under blowdown conditions associated with a pipe break was greater than previously predicted. Because of the important function of these valves, the staff was proposing that BWR licensees determine the applicability of this information to valves in their plant and take expedited actions for any deficiencies found. In addition, because the mechanisms involved, such as under predicting friction factors, could apply widely, all licensees would be requested to assess the applicability of this information to other valves in their plants.

The slides used by the staff in the presentation are provided as an attachment to this enclosure.

BACKGROUND

The review packaged was forwarded by a memorandum dated August 31, 1990 from F. Miraglia to E. Jordan. The package included:

- (1) Proposed supplement.
- (2) Memorandum dated August 13, 1990 from J. Richardson to W. Russell, Subject: Safety Concern Relative to BWR Containment Isolation Valves for HPCI, RCIC and RWCU.
- (3) Letter dated July 27, 1990 from G. Beck, BWR Owners' Group, to J. Richardson, NRC, Subject: BWR Owners' Group Safety Assessment of MOV Isolation Function.
- (4) Responses to contents of packages submitted for CRGR review.

CONCLUSIONS/RECOMMENDATIONS

The CRGR supported the concept of requesting expedited action within the context of the overall MOV testing program, and provided a number of comments. The staff agreed to provide a redrafted letter for CRGR review. If possible the CRGR review would be completed by negative consent rather than at another meeting.



The following suggestions were made:

- (1) BWR licensees should be requested:
  - (a) to describe their findings and plans with respect to these particular valves (e.g., complete the valve testing program within 18 months or, justify the extended time).
  - (b) to address the applicability of the information developed in the NRC-sponsored tests to other valves determine the priorities for their entire valve testing programs under Generic Letter 89-10.
- (2) PWR licensees should also consider the applicability of the information obtained from the MOV tests and the staff's safety evaluation to other MOV's. However, the reporting requirements of the supplement should be addressed to BWR's only.
- (3) The background discussion should be expanded further to discuss the friction factor problem and how it may apply to other sizes and models of valves. It should also indicate the desirability of a final fix instead of a temporary fix. It might, in some cases, take longer than 18 months to achieve a final fix.
- (4) Licensees should be requested to implement appropriate procedures pending completion of any corrective actions on the valves.
- (5) The basis for the letter should be compliance rather than adequate protection. The staff should confirm this aspect with OGC.

This action was considered to be a justified backfit, within the compliance exception in the backfit rule.

Safety goal considerations were not discussed at this meeting.

DISCUSSION OF  
THE PROPOSED SUPPLEMENT 3 TO GENERIC LETTER 89-10  
WITH THE COMMITTEE TO REVIEW GENERIC REQUIREMENTS

September 14, 1990

*Attachment to Enclosure*

*2*

GENERIC LETTER 89-10  
SAFETY-RELATED MOTOR-OPERATED VALVE TESTING AND SURVEILLANCE

ISSUED JUNE 28, 1989

REQUESTED LICENSEES TO ESTABLISH PROGRAMS TO ENSURE CAPABILITY OF ALL MOVs IN SAFETY-RELATED SYSTEMS TO PERFORM THEIR SAFETY FUNCTION.

RECOMMENDS TESTING OF MOVs AT DESIGN-BASIS DIFFERENTIAL PRESSURE AND FLOW CONDITIONS WHERE PRACTICABLE. ALTERNATIVES MAY BE USED WHERE DESIGN-BASIS TESTING NOT PRACTICABLE.

OUTLINES "TWO STAGE" APPROACH FOR INSTANCES WHERE DESIGN-BASIS TESTING NOT PRACTICABLE AND AN ALTERNATIVE CANNOT BE JUSTIFIED AT THIS TIME. WITH THE TWO STAGE APPROACH, MOV SWITCH SETTINGS DETERMINED USING THE BEST DATA AVAILABLE AND THEN LICENSEE OBTAINS APPLICABLE DATA AS SOON AS POSSIBLE.

REQUESTS PERIODIC VERIFICATION OF MOV SWITCH SETTINGS EVERY 5 YEARS.

LICENSEES WERE REQUIRED TO INDICATE THEIR INTENTIONS BY DECEMBER 28, 1989.

PROPOSED SCHEDULE REQUESTED PROGRAM DESCRIPTION ONSITE BY JUNE 28, 1990, OR FIRST REFUELING OUTAGE AFTER DECEMBER 28, 1989, WHICHEVER WAS LATER. (MODIFIED IN SUPPLEMENT 2)

PROPOSED SCHEDULE REQUESTS COMPLETION OF INITIAL TEST PROGRAM BY JUNE 1994 OR 3 REFUELING OUTAGES AFTER DECEMBER 28, 1989, WHICHEVER IS LATER.

GENERIC LETTER 89-10  
(continued)

JUNE 13, 1990            SUPPLEMENT 1

PROVIDES THE RESULTS OF THE PUBLIC WORKSHOPS TO DISCUSS THE  
GENERIC LETTER AND TO ANSWER QUESTIONS REGARDING ITS  
IMPLEMENTATION.

LIMITS SCOPE OF GENERIC LETTER TO MOVs IN SAFETY-RELATED PIPING  
SYSTEMS.

LIMITS CONSIDERATION OF VALVE MISPOSITIONING TO INADVERTENT  
OPERATION FROM THE CONTROL ROOM.

DISCUSSES THE FACTORS TO BE CONSIDERED, AND LIMITATIONS, IN  
JUSTIFYING THE ACCEPTABILITY OF ALTERNATIVES TO TESTING MOVs IN  
SITU UNDER DESIGN-BASIS DIFFERENTIAL PRESSURE AND FLOW  
CONDITIONS.

EMPHASIZES THE RECOMMENDATION TO FOLLOW THE TWO STAGE APPROACH  
WHERE DESIGN-BASIS TESTING IS NOT PRACTICABLE AND AN ALTERNATIVE  
CANNOT BE JUSTIFIED AT THIS TIME.

AUGUST 3, 1990            SUPPLEMENT 2

ALLOWS ADDITIONAL TIME FOR LICENSEES TO INCORPORATE THE  
INFORMATION IN SUPPLEMENT 1 INTO THEIR GENERIC LETTER PROGRAMS BY  
STATING THAT PROGRAM DESCRIPTIONS NEED NOT BE AVAILABLE ON SITE  
UNTIL JANUARY 1, 1991.

GENERIC ISSUE 87  
FAILURE OF HPCI STEAM LINE WITHOUT ISOLATION

INITIAL SCOPE: CONTAINMENT ISOLATION MOTOR-OPERATED GATE VALVES IN HPCI AND RCIC STEAM TURBINE LINES, AND RWCU SUPPLY LINE.

PHASE I (1988) TESTING: 2 SIX-INCH RWCU VALVES (ANCHOR/DARLING AND VELAN) UNDER HIGH ENERGY HOT WATER LOADS.

PHASE II (1989) TESTING: 3 SIX-INCH RWCU VALVES (ANCHOR/DARLING, VELAN, AND WALWORTH) AND 3 TEN-INCH HPCI VALVES (ANCHOR/DARLING, POWELL, AND VELAN) UNDER NORMAL AND BLOWDOWN LOADS.

PUBLIC MEETINGS ON FEBRUARY 1, 1989, AND APRIL 18, 1990.

INFORMATION NOTICE 90-40 (JUNE 5, 1990), RESULTS OF NRC-SPONSORED TESTING OF MOTOR-OPERATED VALVES

1. MORE THRUST REQUIRED THAN PREDICTED FROM STANDARD INDUSTRY EQUATION
2. SOME VALVES INTERNALLY DAMAGED AND REFERRED TO AS "UNPREDICTABLE"
3. STATIC AND LOW FLOW TESTING MIGHT NOT PREDICT PERFORMANCE UNDER DESIGN-BASIS FLOW CONDITIONS
4. DURING OPENING, HIGHEST LOAD NOT ALWAYS AT UNSEATING
5. PARTIAL STROKING DID NOT REVEAL REQUIRED THRUST
6. TORQUE, THRUST, AND MOTOR OPERATING PARAMETERS NEEDED TO FULLY CHARACTERIZE MOV PERFORMANCE
7. RELIABLE USE OF MOV DIAGNOSTICS NEEDS ACCURATE EQUIPMENT AND TRAINED PERSONNEL.

## STAFF EVALUATION OF THE MOV TEST RESULTS

ON MAY 10, 1990, NRC VALVE REVIEW GROUP MET TO DISCUSS THE NEED FOR PROMPT STAFF ACTION IN RESPONSE TO THE MOV TEST RESULTS.

AFTER DISCUSSIONS WITH NRR MANAGEMENT, STAFF CONDUCTED INFORMAL SURVEY OF 6 BWR UNITS TO DETERMINE THE CAPABILITY OF THE MOVs USED FOR CONTAINMENT ISOLATION IN THE STEAM LINE OF THE HPCI AND RCIC SYSTEMS, AND IN THE SUPPLY LINE FOR THE RWCU SYSTEM.

ON MAY 24, STAFF MET WITH BWR OWNERS GROUP TO DISCUSS THE RESULTS OF THAT SURVEY.

IN RESPONSE TO STAFF CONCERNS, THE BWR OWNERS GROUP AGREED TO OBTAIN SIMILAR INFORMATION FOR THE REMAINING BWR UNITS.

ON JULY 6, THE BWR OWNERS GROUP PROVIDED INFORMATION ON THE CURRENT CAPABILITY OF MOVs USED FOR CONTAINMENT ISOLATION IN THE HPCI, RCIC AND RWCU SYSTEMS.

AFTER EVALUATING THE PROVIDED INFORMATION, THE STAFF ACTIVATED THE BWR REGULATORY RESPONSE GROUP (RRG). PUBLIC MEETINGS WERE THEN HELD ON AUGUST 1 AND SEPTEMBER 7 TO DISCUSS SAFETY ASSESSMENTS PERFORMED BY THE STAFF AND THE BWR OWNERS GROUP, AND ACTIONS PLANNED BY THE STAFF AND THE BWR OWNERS GROUP.

MOV DATA REQUESTED FROM THE BWR OWNERS GROUP

FOR THE MOVs USED FOR CONTAINMENT ISOLATION IN THE STEAM SUPPLY LINES OF THE HIGH PRESSURE COOLANT INJECTION (HPCI) AND REACTOR CORE ISOLATION COOLING (RCIC) SYSTEMS AND IN THE SUPPLY LINE TO THE REACTOR WATER CLEANUP (RWCU) SYSTEM, THE FOLLOWING DATA WERE REQUESTED:

1. TYPE AND SIZE OF MOTOR, ACTUATOR, AND VALVE (INCLUDING DISK),
2. MANUFACTURER OF MOTOR, ACTUATOR, AND VALVE,
3. DESIGN DIFFERENTIAL PRESSURE AND FLUID TEMPERATURE FOR OPENING AND CLOSING OF THE VALVE, AND
4. THRUST DELIVERED AT THE CURRENT TORQUE SWITCH SETTING, DIFFERENTIAL PRESSURE AT WHICH TESTS CONDUCTED, AND BASIS FOR DELIVERED THRUST VALUE.



METHODOLOGY USED IN THE EVALUATION OF THE MOV DATA

1. EVALUATE ONLY GATE VALVES (GLOBE VALVES ASSUMED TO BE ADEQUATE).
2. FOR GATE VALVES WITH SAME SIZE AND MANUFACTURER AS THOSE IN NRC TESTS, USE INFORMATION NOTICE 90-40 TO ESTIMATE THRUST REQUIREMENTS.
3. FOR GATE VALVES WITH SAME SIZE BUT DIFFERENT MANUFACTURER FROM NRC TESTS, ASSUME THE VALVE PERFORMS IN A MANNER SIMILAR TO TESTED VALVES REQUIRING THE LEAST AMOUNT OF THRUST AMONG THOSE TESTED FOR THE SAME FLUID CONDITIONS.
4. FOR GATE VALVES WITH DIFFERENT SIZE THAN TESTED VALVES, THE THRUST REQUIREMENTS WERE ESTIMATED ASSUMING THE VALVE WAS NOT DAMAGED DURING OPERATION.
5. TORQUE SWITCH SETTINGS FOR EACH GATE VALVE IDENTIFIED BY THE BWROG WERE COMPARED TO ESTIMATED THRUST REQUIREMENTS.
6. ACTUATOR RATINGS WERE COMPARED TO ESTIMATED THRUST REQUIREMENTS.
7. MOTOR SIZES WERE COMPARED TO MOTOR SIZES USED IN TESTS AND ESTIMATES OF MOTOR THRUST CAPABILITY.

7/31/90

BWROG MOV DATA OVERVIEW

HPCI TOTAL NUMBER OF VALVES = 46

MOVs WITHOUT IDENTIFIED CONCERNS (INCLUDING 4 GLOBE VALVES)	18
MOVs WITH MARGINAL MOTOR, ACTUATOR, OR T. S. SETTING	16
MOVs WITH SMALL (OR LOW) MOTOR, ACTUATOR, OR T. S. SETTING UNITS L, M, P, T, V, Z, HATCH 1, HATCH 2, MONTICELLO* (9 OUT OF 23 REACTOR UNITS)	12

\* JUSTIFICATION SUPPLIED

RCIC TOTAL NUMBER OF VALVES = 62

MOVs WITHOUT IDENTIFIED CONCERNS (INCLUDING 7 GLOBE VALVES)	47
MOVs WITH MARGINAL MOTOR, ACTUATOR, OR T. S. SETTING	9
MOVs WITH SMALL (OR LOW) MOTOR, ACTUATOR, OR T. S. SETTING UNITS E, G, N, Q, T (5 OUT OF 30 REACTOR UNITS)	6

RWCU TOTAL NUMBER OF VALVES = 71

MOVs WITHOUT IDENTIFIED CONCERNS (INCLUDING 8 GLOBE VALVES)	19
MOVs WITH MARGINAL MOTOR, ACTUATOR, OR T. S. SETTING	12
MOVs WITH SMALL (OR LOW) MOTOR, ACTUATOR, OR T. S. SETTING UNITS B, D, H, I, K, L, N, P, Q, R, S, T, U, V, W, Y, Z, AC, HATCH 2, QUAD CITIES 1, QUAD CITIES 2 (21 OUT OF 34 REACTOR UNITS)	40

8 UNITS WITH MOV PROBLEMS (SMALL/LOW CATEGORY) IN MULTIPLE SYSTEMS

HPCI + RCIC + RWCU	1 (T)
HPCI + RCIC	0
HPCI + RWCU	5 (L, P, V, Z, HATCH 2)
RCIC + RWCU	2 (N, Q)

7/31/90

## EXAMPLES OF STAFF FINDINGS

UNIT	SYSTEM	VALVE	SIZE (in.)	D/P (psid)	T.S. SETTING (lbs)	THRUST ESTIMATE FROM TEST (lbs)
M	HPCI	CRANE	10	1200	17460	29000
M	HPCI	CRANE	10	1200	22540	29000
T	HPCI	A/D	10	1250	26271	30000
T	HPCI	A/D	10	1250	20326	30000
V	HPCI	CRANE	10	1250	24017	29000
HATCH 1	HPCI	CRANE	10	1080	23055	29000
Q	RCIC	A/D	10	1146	23478	30000
D	RWCU	A/D	6	1020	12300	20000
D	RWCU	A/D	6	1020	16100	20000
I	RWCU	A/D	6	1190	10039	20000
K	RWCU	A/D	6	1040	12241	20000
K	RWCU	A/D	6	1040	14928	20000
L	RWCU	A/D	6	1150	13233	20000
L	RWCU	A/D	6	1150	13220	20000
N	RWCU	A/D	6	1250	13405	20000
N	RWCU	A/D	6	1250	13405	20000
P	RWCU	A/D	6	1150	16069	20000
P	RWCU	A/D	6	1150	13786	20000
Q	RWCU	A/D	6	1250	13405	20000
Q	RWCU	A/D	6	1250	13405	20000
R	RWCU	A/D	6	1173	13780	20000
S	RWCU	A/D	6	1025	12800	20000
S	RWCU	A/D	6	1025	12800	20000
T	RWCU	A/D	6	1020	9354	20000
T	RWCU	A/D	6	1020	11465	20000
W	RWCU	A/D	6	1135	15400	20000
Y	RWCU	A/D	6	1025	12800	20000
Y	RWCU	A/D	6	1025	12800	20000
QC 1	RWCU	CRANE	6	1250	6506	12000
QC 1	RWCU	A/D	6	1250	8333	20000
QC 2	RWCU	CRANE	6	1250	4004	12000
QC 2	RWCU	A/D	6	1250	10190	20000

NRC STAFF SAFETY ASSESSMENT OF POTENTIAL MOV DEFICIENCIES  
IN HPCI, RCIC, AND RWCU SYSTEMS

LIKELIHOOD OF PIPE BREAK

HPCI and RCIC Low Erosion/Corrosion Susceptibility  
HPCI and RCIC steam lines predicted to have insignificant erosion/corrosion.

RWCU Augmented Inspections  
In response to GL 88-01, licensees have committed to augmented inspections of RWCU supply lines.

Piping Stress Levels  
ASME Section III piping has substantial margin between allowable stress and material ultimate strength.

Failure Mechanisms  
Large pipe breaks have low probability. Small break/leak likely to be detected by temperature and sump level monitors with early MOV closure by plant procedures.

PLANT MITIGATIVE FEATURES

Margin on Assumed Differential Pressure  
Actual differential pressure during the blowdown event might be lower than design differential pressure.

Valve Redundancy  
Partial closure of MOVs in series might reduce the pressure load on each MOV.

Closure After Depressurization  
If not significantly damaged by unsuccessful closure attempt, MOV might be closed following depressurization.

Consequence Mitigation  
If makeup water available, core cooling can continue with available systems until broken line is isolated.

RISK PROBABILITY ANALYSIS

Staff risk experts determined potential MOV deficiency should be resolved promptly, but immediate action not justified. Preliminary results of sensitivity analysis available by late October 90.

SUPPLEMENT 3 TO GENERIC LETTER 89-10

BACKGROUND and DISCUSSION

NRC-SPONSORED TESTS OF MOV'S TYPICALLY USED TO PROVIDE CONTAINMENT ISOLATION IN STEAM LINES OF HPCI AND RCIC SYSTEMS AND IN THE SUPPLY LINE TO RWCU SYSTEMS REVEALED THAT THE THRUST REQUIRED TO CLOSE THE VALVES UNDER BLOWDOWN CONDITIONS WAS HIGHER THAN PREVIOUSLY PREDICTED. STAFF REVIEW OF NRC TEST DATA AND MOV DATA PROVIDED BY BWR LICENSEES INDICATES THAT MOV DEFICIENCIES MIGHT EXIST.

REQUESTED LICENSEE ACTIONS

BWR LICENSEES SHOULD ASSESS APPLICABILITY OF NRC TEST DATA; DETERMINE AS-IS CAPABILITY OF HPCI, RCIC AND RWCU MOV'S; AND IDENTIFY MOV DEFICIENCIES.

BWR LICENSEES SHOULD PERFORM PLANT-SPECIFIC SAFETY ASSESSMENTS TO VERIFY STAFF AND BWROG ASSESSMENTS (ENCLOSURES TO SUPPLEMENT 3)

ALL LICENSEES SHOULD CONSIDER THE APPLICABILITY OF THE NRC TEST DATA IN THEIR GENERIC LETTER 89-10 PROGRAMS

REPORTING REQUIREMENTS

1. WITHIN 30 DAYS, BWR LICENSEES SHALL NOTIFY STAFF OF AVAILABILITY OF PLANT-SPECIFIC SAFETY ASSESSMENT.
2. WITHIN 90 DAYS, BWR LICENSEES SHALL PROVIDE
  - (a) CRITERIA APPLIED IN DETERMINING WHETHER MOV DEFICIENCIES EXIST,
  - (b) IDENTIFICATION OF DEFICIENT MOV'S, AND
  - (c) SCHEDULE FOR ANY NECESSARY CORRECTIVE ACTION.
3. BWR LICENSEES SHALL INFORM STAFF OF ANY CHANGES TO PLANNED ACTIONS OR SCHEDULE.

SUPPLEMENT 3 STATES THAT STAFF SAFETY ASSESSMENT JUSTIFIES CONTINUED OPERATION FOR AT LEAST ONE REFUELING CYCLE TO RESOLVE MOV DEFICIENCIES. BWR LICENSEES SHOULD PROVIDE JUSTIFICATION IF ADDITIONAL TIME NEEDED.

Enclosure 3 to the Minutes of CRGR Meeting No. 191  
Proposed Regulatory Guide on Standard Format  
and Content for Licensing Renewal and Proposed  
Standard Review Plan for License Renewal

September 14, 1990

TOPIC

R. Bosnak and J. Vora of RES and W. Travers, J. Craig and J. Thoma of NRR presented for CRGR review a proposed regulatory guide on standard format and content for license renewal and a proposed standard review plan for license renewal. The documents were intended to be forwarded to the Executive Director for Operations and the Commission and then to be published for comment. They had been drafted to support a proposed rule (10 CFR 54) which had been published for comment on July 17, 1990. They generally implemented the provisions of the proposed rule. It was understood that, if the rule should change in a material way, the regulatory guide and standard review plan would also need to be changed. It was also recognized that the documents would be revised as the staff learned more about license renewal issues and their resolutions.

A copy of the slides used by the staff in the presentation is provided as an attachment to this enclosure.

BACKGROUND

The package provided for CRGR review was transmitted by a memorandum dated August 31, 1990 from E. Beckjord and T. Murley to E. Jordan. The package included:

1. Proposed regulatory guide on standard format and content.
2. Proposed standard review plan.

CONCLUSIONS/RECOMMENDATIONS

The Committee recommended in favor of the proposed documents. The Committee provided a number of comments which the staff agreed to consider. No coordination with the CRGR staff or re-review by the CRGR documents was requested.

The staff indicated in the review package that these documents were not considered backfits. The CRGR had no questions or comments on this determination.

The staff indicated in the presentation that the proposed documents were aimed at maintaining the current licensing basis during the renewal term and the relationship of a facility to the safety goals would, therefore, remain consistent with that of the original license term (see Slide 6). The CRGR had no questions or comments on this determination.

DRAFT REGULATORY GUIDE DG-1009

AND

STANDARD REVIEW PLAN FOR LICENSE RENEWAL (SRP-LR)

PRESENTATION TO CRGR  
SEPTEMBER 14, 1990

WILLIAM D. TRAVERS, JOHN CRAIG, AND JOHN THOMA  
OFFICE OF NUCLEAR REACTOR REGULATION

ROBERT J. BOSNAK AND JITENDRA VORA  
OFFICE OF NUCLEAR REGULATORY RESEARCH

*Attachment to  
Enclosure 3*



## PURPOSE

- \* TO DISCUSS THE DRAFT R.G. ON FORMAT AND CONTENT.
- \* TO DISCUSS THE DRAFT STANDARD REVIEW PLAN FOR LICENSE RENEWAL.
- \* TO REQUEST CRGR TO MAKE A POSITIVE RECOMMENDATION TO THE EDO.

## PRESENTATION OUTLINE

- \* INTRODUCTORY REMARKS
- \* SCHEDULE
- \* SAFETY GOALS
- \* DRAFT REGULATORY GUIDE DG-1009
- \* DRAFT STANDARD REVIEW PLAN FOR LICENSE RENEWAL (SRP-LR)
- \* RESPOND TO QUESTIONS

## INTRODUCTORY REMARKS

LICENSE RENEWAL INVOLVES MANY INTEGRATED ACTIVITIES :

- \* RULEMAKING (10 CFR PART 51 AND 10 CFR PART 54)
- \* REGULATORY GUIDE DEVELOPMENT
- \* STANDARD REVIEW PLAN FOR LICENSE RENEWAL DEVELOPMENT
- \* INDUSTRY REPORT DEVELOPMENT AND REVIEW
- \* LEAD PLANT REVIEWS

SCHEDULE FOR RG AND SRP-LR

- \* MEET WITH CRGR IN SEPTEMBER 1990.
- \* MEET WITH THE ACRS IN OCTOBER 1990.
- \* SRP-LR AND R.G. TO EDO BY OCTOBER 19, 1990.
- \* SRP-LR AND R.G. TO COMMISSION BY NOVEMBER 2, 1990.
- \* PUBLISH FOR PUBLIC COMMENT BY MID-DECEMBER 1990.
- \* REVISED PACKAGE TO ACRS/CRGR BY NOVEMBER 1991.
- \* REVISED PACKAGE PUBLISHED BY APRIL 1992.

## SAFETY GOALS

- \* ATOMIC ENERGY ACT ALLOWS PROVISIONS FOR LICENSE RENEWAL (SEE 10 CFR 50.51).
- \* THE ACTIONS AND CRITERIA DESCRIBED IN THE DRAFT REGULATORY GUIDE AND STANDARD REVIEW PLAN FOR LICENSE RENEWAL PROVIDE GUIDANCE TO THE LICENSEES AND THE STAFF.
- \* CLB MAINTAINED
- \* THEREFORE, THE RELATIONSHIP OF THE FACILITY TO THE SAFETY GOALS REMAINS CONSISTENT WITH THAT OF THE ORIGINAL LICENSING TERM.

## INTRODUCTORY REMARKS ON BACKGROUND OF REGULATORY GUIDE DEVELOPMENT

DISCUSSION OF NEEDED REGULATORY DOCUMENTS TO SUPPORT LICENSE RENEWAL RULE USING NPAR PROGRAM RESULTS (1987-89)

POSSIBLE REGULATORY GUIDE CANDIDATES (SECY-89-275)

- MAJOR COMPONENTS AND STRUCTURES
- SIGNIFICANT AGING MECHANISMS
- SELECTION OF COMPONENTS AND STRUCTURES
- FORMAT AND CONTENT OF TECHNICAL INFORMATION

DECISION REACHED (RES & NRR) IN 1989 TO DEVELOP SINGLE GUIDE ON FORMAT AND CONTENT OF TECHNICAL INFORMATION INCLUDING GUIDANCE ON AGING MANAGEMENT AND SCREENING (SECY 90-021)

AS REPORTED IN SECY 90-021, DECISION ANTICIPATED THAT INDUSTRY REPORT PROCESS BY NUMARC WILL PROVIDE FOR SPECIFIC COMPONENT NEEDS, AGING MECHANISMS, AND SCREENING. IF UNSUCCESSFUL, NEEDED RG/SRP WILL BE PREPARED AS REQUIRED.

DRAFT R.G. DG-1009

- STANDARD FORMAT AND CONTENT OF TECHNICAL INFORMATION FOR  
APPLICATION TO RENEW NUCLEAR POWER PLANT OPERATING LICENSES



- PURPOSE
- SCOPE
- FORMAT FOR TECHNICAL INFORMATION
- TECHNICAL INFORMATION CONTENT

SSC IMPORTANT TO LICENSE RENEWAL

SC REQUIRING EVALUATION OF AGE RELATED DEGRADATIONS

UNDERSTANDING AGING

- AGING MECHANISMS

MANAGING AGING

RECORDKEEPING AND TRENDING

- REGULATORY ANALYSIS
- BACKFIT ANALYSIS

PURPOSE OF R.G. DG-1009

PROVIDE REGULATORY GUIDELINES FOR A UNIFORM FORMAT AND CONTENT FOR TECHNICAL  
INFORMATION TO BE SUBMITTED AS PART OF LICENSE RENEWAL APPLICATION

## SCOPE

### INCLUDES:

- FORMAT AND CONTENT OF TECHNICAL INFORMATION
- CRITERIA FOR SELECTION OF SYSTEMS, STRUCTURES, AND COMPONENTS (SSC)  
IMPORTANT TO LICENSE RENEWAL
- GUIDELINES FOR
  - UNDERSTANDING AGING
  - MANAGING AGING

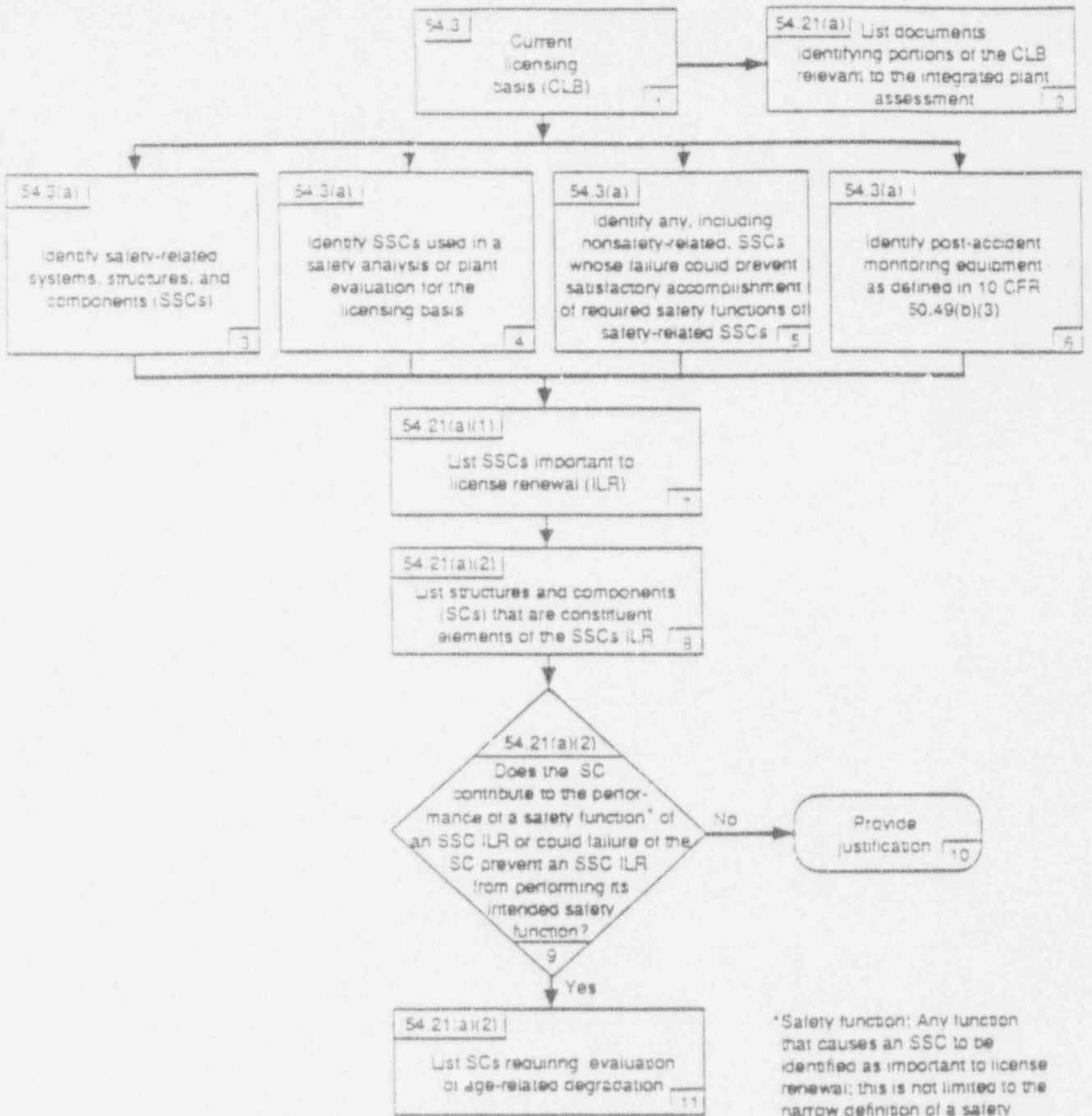
## FORMAT FOR TECHNICAL INFORMATION

- FORMAL APPLICATION
  - SUMMARY OF FINDINGS
  - IMPLEMENTATION PLAN
  
- FSAR SUPPLEMENTAL INFORMATION
  - SYSTEMS
  - COMPONENTS
  - SUPPORTING DOCUMENTATION

## TECHNICAL INFORMATION CONTENT

PROVIDES GUIDELINES FOR:

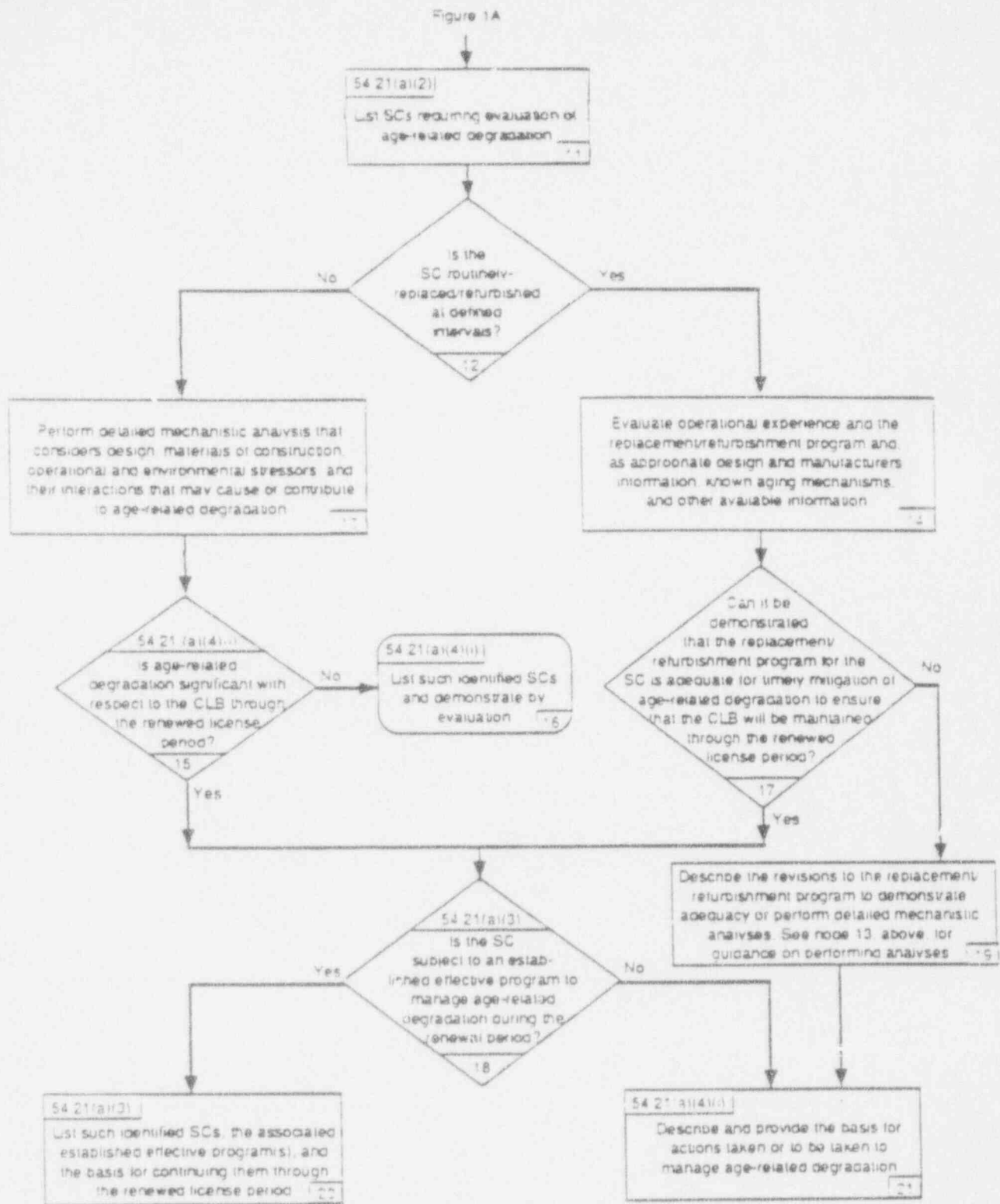
- SELECTION OF SSC IMPORTANT TO LICENSE RENEWAL (ITLR)
- INTEGRATED PLANT ASSESSMENT
  - UNDERSTANDING AGING
  - MANAGING AGING
    - ESTABLISHED EFFECTIVE PROGRAMS
    - ACTIONS TO BE TAKEN



\*Safety function: Any function that causes an SSC to be identified as important to license renewal; this is not limited to the narrow definition of a safety function associated with safety-related equipment.

Figure 1B

FIGURE 1A  
Integrated Plant Assessment -- Identification of Important-To-License-Renewal SSCs and SCs Requiring Evaluation of Age-Related Degradation



**FIGURE 1B**  
Integrated Plant Assessment -- Evaluation of Age-Related Degradation



- RECORDKEEPING AND TRENDING

10CFR54 REQUIREMENTS

AUDITABILITY AND RETRIEVABILITY

IMPLEMENTATION THROUGH PLANT PROGRAMS

CONTROL OF ADMINISTRATIVE PROCESS

APPLICATIONS FOR AGING MANAGEMENT

- REGULATORY ANALYSIS

NUREG-1362 CONTAINS REGULATORY ANALYSIS FOR PROPOSED 10CFR54 RULE

- BACKFIT ANALYSIS

NOT A BACKFIT UNDER 10CFR50.109

SINCE THE R.G. DG-1009 IMPLEMENTS 10CFR54 NO ADDITIONAL REGULATORY OR BACKFIT ANALYSIS IS NECESSARY

- SELECTION OF SSC IMPORTANT TO LICENSE RENEWAL
  - 10CFR54 REQUIREMENTS
  - DETERMINISTIC APPROACH
  - RISK-BASED SUPPLEMENTAL APPROACH

RG-BU-1

- UNDERSTANDING AGING

10CFR54 REQUIREMENTS

MATERIALS

STRESSORS

ENVIRONMENT

SERVICE CONDITION

MECHANISMS

DEGRADATION SITES

ROOT CAUSE(S)

- AGING MECHANISMS

FATIGUE

EROSION

EROSION/CORROSION

RADIATION EMBRITTLEMENT

THERMAL EMBRITTLEMENT

CORROSION

WEAR

SHRINKAGE/CREEP

CHEMICAL EFFECTS/CONTAMINATION

- MANAGING AGING

10CFR54 REQUIREMENTS

INSPECTION

SURVEILLANCE

CONDITION MONITORING

NONDESTRUCTIVE EXAMINATION

ROOT CAUSE ANALYSIS

REPAIR, REFURBISHMENT

REPLACEMENT/CORRECTIVE MAINTENANCE

PREVENTIVE MAINTENANCE

PREDICTIVE MAINTENANCE

ADJUSTMENTS IN DESIGNS,

OPERATIONAL ENVIRONMENT

SERVICE CONDITIONS

RG-BU-4

STANDARD REVIEW PLAN FOR LICENSE RENEWAL (SRP-LR)

DRAFT NUREG 1299

- \* PURPOSE
- \* SCOPE
- \* ORGANIZATION
- \* REVIEW CRITERIA
- \* IMPLEMENTATION
- \* FUTURE REVISIONS

A DOCUMENT WHICH PROVIDES A FRAMEWORK FOR REVIEW AND WHICH WILL BE REVISED AS A RESULT OF PUBLIC COMMENTS AND AS EXPERIENCE IS GAINED FROM INDUSTRY TECHNICAL REPORTS, PILOT PLANT APPLICATION REVIEWS, AND ONGOING RESEARCH.

SRP-LR-1

## PURPOSE OF SRP-LR

- \* PROVIDE STAFF GUIDANCE FOR REVIEW OF THE:
  - SUFFICIENCY OF AN APPLICATION
  - APPLICANT'S SCREENING METHODOLOGY
  - POTENTIAL AGE-RELATED DEGRADATION MECHANISMS FROM A:
    - + SYSTEM PERSPECTIVE
    - + COMPONENT PERSPECTIVE
- \* PROVIDE GUIDANCE TO EVALUATE AGE-RELATED MANAGEMENT ACTIVITIES TO DETERMINE WHETHER OR NOT AN ESTABLISHED EFFECTIVE PROGRAM WILL BE OR HAS BEEN IMPLEMENTED
- \* PROVIDE GUIDANCE ON ACCEPTABLE AGING MANAGEMENT PRACTICES.

SRP-LR-2



## SCOPE OF SRP-LR

- \* PROVIDES A CHECKLIST FOR DETERMINING THE SUFFICIENCY OF AN APPLICATION.
- \* REVIEW DEFINED BY 10 CFR PART 54 AND LIMITED TO:
  - SSCs IMPORTANT TO LICENSE RENEWAL
  - AGE-RELATED DEGRADATION CONCERNS
- \* CONCERNS ARISING FROM CLB ISSUES ARE OUTSIDE THE SCOPE OF SRP-LR. CHANGES TO THE CLB WILL BE REVIEWED IN ACCORDANCE WITH THE GUIDANCE PROVIDED BY NUREG 0800.
- \* "LIVING DOCUMENT" WHICH WILL BE REVISED AS EXPERIENCE IS GAINED FROM INDUSTRY TECHNICAL REPORTS, PILOT PLANT APPLICATION REVIEWS, AND ONGOING RESEARCH AND AS A RESULT OF PUBLIC COMMENTS.

## ORGANIZATION OF SRP-LR

- \* DEVELOPMENT OF SRP-LR
- \* THREE MAJOR SECTIONS:
  - PART A - GENERAL INFORMATION AND DISCUSSION
  - PART B - SYSTEMS
  - PART C - GENERIC COMPONENTS AND STRUCTURES
- \* GENERAL STRUCTURE FOR SRP-LR PART B AND C SECTIONS
  - REVIEW RESPONSIBILITIES
  - AREAS OF REVIEW
  - ACCEPTANCE CRITERIA
  - REVIEW PROCEDURES
  - FINDINGS
  - IMPLEMENTATION
  - GENERAL INFORMATION
  - REFERENCES

SRP-LR-4

## SRP-LR PART A - GENERAL INFORMATION AND DISCUSSION

- \* DESCRIBES THE PURPOSE, SCOPE, AND ORGANIZATION OF SRP-LR.
- \* DESCRIBES THE GENERAL REQUIREMENTS OF THE LICENSE RENEWAL RULE.
- \* PROVIDES A DETAILED CHECKLIST TO BE USED WHEN EVALUATING THE SUFFICIENCY OF A LICENSE RENEWAL APPLICATION.

### APPENDIX A

- \* PROVIDES GUIDANCE FOR THE STAFF REVIEW OF THE APPLICANT'S SCREENING METHODOLOGY FOR IDENTIFYING SSCs IMPORTANT TO LICENSE RENEWAL.

## SRP-LR PART B - SYSTEMS

- \* PROVIDES GUIDANCE FOR THE STAFF SYSTEM LEVEL REVIEW TO DETERMINE IF RENEWAL APPLICANTS HAVE:
  - IDENTIFIED AGING MECHANISMS FOR SCs OF CONCERN AND
  - DESCRIBED ESTABLISHED EFFECTIVE PROGRAMS, PROGRAM MODIFICATIONS, OR NEW PROGRAMS WHICH ADDRESS AGING DEGRADATION CONCERNS OR
  - PROVIDED ANALYSIS OF AGE-RELATED DEGRADATION WHICH ESTABLISH THAT DEGRADATION FOR THE RENEWAL TERM IS NOT SIGNIFICANT.

SRP-LR PART B (CONT.)

- \* ORGANIZED ON A SYSTEM BASIS
  - NOT ALL SYSTEMS EXPECTED IN A RENEWAL APPLICATION ARE SPECIFICALLY INCLUDED IN SRP-LR PART B.
  - A GENERIC SYSTEM CHAPTER PROVIDES STAFF GUIDANCE FOR SYSTEMS NOT SPECIFICALLY ADDRESSED.
- \* FOR INDIVIDUAL COMPONENTS OR STRUCTURES WITHIN A GIVEN SYSTEM, THE APPROPRIATE SECTIONS OF SRP-LR PART C ARE REFERRED.

## SRP-LR PART C - GENERIC COMPONENTS AND STRUCTURES

- \* PROVIDES REVIEW CRITERIA FOR SPECIFIC GROUPS OF COMPONENTS AND STRUCTURES.
- \* SRP-LR PART C EXPECTED TO BE THE DOMINATE PART OF SRP-LR FROM A TECHNICAL VIEW POINT.

## REVIEW CRITERIA

- \* SRP-LR CONTAINS SPECIFIC CRITERIA RELATED TO MANAGING AGING DEGRADATION CONCERNS FOR INDIVIDUAL SSCs.
- \* IN GENERAL, THESE NEW CRITERIA:
  - ARE ADDITIONAL INSPECTIONS OR ANALYSIS WHICH MAY OR MAY NOT BE CURRENTLY REQUIRED BUT WHICH WILL BE USED TO DETERMINE THE ACTUAL STATUS OF SCs FROM AN AGING PERSPECTIVE.
  - ARE DERIVED FROM THE NPAR PROGRAM, PLANT EXPERIENCE, AND ENGINEERING JUDGEMENT.
- \* THESE CRITERIA WILL EVOLVE AS A RESULT OF PUBLIC COMMENTS, INDUSTRY TECHNICAL REPORTS, AND PILOT PLANT REVIEWS.

SRP-LR-9

## EXAMPLES OF SPECIFIC NEW REVIEW CRITERIA

### \* SRP-LR C.1.1 PIPING

- THE LICENSEE SHALL HAVE A PROGRAM FOR MEASUREMENT OF PIPE WALL THINNING, PARTICULARLY FOR PIPING EXEMPT FROM ASME CODE SECTION XI BUT IMPORTANT TO LICENSE RENEWAL.
- THE LICENSEE SHALL VERIFY USING PLANT-SPECIFIC FATIGUE ANALYSIS THAT THE ASME SECTION III CUMULATIVE USAGE FACTOR ALLOWABLE OF 1.0 WILL NOT BE EXCEEDED. CONSIDERABLE FATIGUE GUIDANCE IS PROVIDED IN THE REVIEW PROCEDURE SECTION.
- THE LICENSEE SHALL HAVE A PROGRAM TO SAMPLE FOR STRESS CORROSION CRACKING.
- THE LICENSEE SHOULD INVESTIGATE POTENTIAL FLOW REDUCTION PROBLEMS.



EXAMPLES OF SPECIFIC NEW REVIEW CRITERIA (CONT.)

\* SRP-LR B.4.4 EMERGENCY DIESEL GENERATORS (EDGs)

- EDG GOAL RELIABILITY HAS BEEN MET FOR LAST 10 YEARS AND ALL OPERATING BOUNDARIES ARE CURRENTLY WITHIN ACCEPTABLE LIMITS ESTABLISHED BY THE MANUFACTURER.
- ENGINE CRANKSHAFT AND GENERATOR ALIGNMENT IS WITHIN THE MANUFACTURER'S RECOMMENDATIONS.
- MAIN BEARING WEAR SHOULD NOT EXCEED THE MANUFACTURER'S RECOMMENDATION.
- FATIGUE CRACKING OF CONNECTING ROD BEARINGS SHOULD NOT EXIST.
- NO GEAR FATIGUE OR EXCESSIVE WEAR SHOULD BE FOUND.
- TURBOCHARGERS SHOULD BE FREE FROM SIGNS OF INGESTION DAMAGE, FATIGUE CRACKING, AND BEARING DAMAGE.

SRP-LR-11

## IMPLEMENTATION OF SRP-LR

- \* LICENSE RENEWAL APPLICATION RECEIVED.
- \* APPLICATION SUFFICIENT TO COMMENCE DETAILED REVIEW.
- \* REVIEW OF SCREENING METHODOLOGY.
- \* REVIEW FROM A SYSTEMS, COMPONENT, AND STRUCTURE PERSPECTIVE.
- \* INTEGRATION INTO A COMPOSITE SAFETY EVALUATION REPORT.

SRP-LR-12

## FUTURE REVISIONS

\* FUTURE REVISIONS WILL BE BASED UPON:

- PUBLIC COMMENTS.
- EXPERIENCED GAINED FROM THE REVIEW OF  
INDUSTRY TECHNICAL REPORTS.
- EXPERIENCED GAINED FROM THE REVIEW OF THE PILOT PLANTS.
- EXPERIENCED GAINED FROM THE NPAR PROGRAM.

## SAFETY GOALS - BACKUP SLIDE

- \* IMPLEMENTATION OF DG-1009 AND SRP-LR WOULD NOT RESULT IN ADDITIONAL RISK TO LIFE OR HEALTH DURING THE RENEWAL TERM.
  - THE FOCUS IS ON ASSURING OPERATION OF SSC WHICH ARE IMPORTANT TO LICENSE RENEWAL AND ARE SUBJECT TO AGE-RELATED DEGRADATION.
  - DESIGN CHANGES WOULD ONLY OCCUR WHEN SYSTEMS OR STRUCTURES ARE JUDGED NOT ACCEPTABLE FOR CONTINUED OPERATION DURING THE RENEWAL TERM.
- \* IMPLEMENTATION OF DG-1009 AND SRP-LR WOULD NOT INCREASE SOCIAL RISKS TO LIFE AND HEALTH ABOVE THOSE CALCULATED FOR PRESENT PLANT OPERATION.

## EXAMPLES OF NEW REVIEW CRITERIA

### \* SRP-LR C.1.3 PUMPS

- THE LICENSEE SHOULD HAVE A PROGRAM TO DETECT SMALL FLAWS CAUSED BY THERMAL EMBRITTLEMENT AND STUD CORROSION.

- THE LICENSEE SHOULD CONDUCT BOTH SURFACE AND VOLUMETRIC INSPECTIONS OF PUMP BODIES.

### \* SRP-LR C.1.4 HEAT EXCHANGERS

- THE LICENSEE SHOULD EVALUATE THE HEAT EXCHANGERS FOR MINIMUM WALL THICKNESS AND CONDUCT APPROPRIATE SAMPLING.

### \* SRP-LR CIVIL STRUCTURES

- MANY ONE-TIME ONLY INSPECTIONS ARE REQUESTED OF STRUCTURES AND FOUNDATIONS TO ESTABLISH CURRENT CONDITIONS.

## EXAMPLES OF NEW REVIEW CRITERIA

### \* SRP-LR B.4.4 EMERGENCY DIESEL GENERATORS

- THIS CHAPTER CONTAINS SIX ONE-TIME TESTS AND ENGINE CONDITION REVIEWS.

### \* SRP-LR B.3.1 PRIMARY CONTAINMENT SYSTEM

- LICENSEES SHOULD COMMIT TO RG 1.35 (ISI OF UNGROUTED TENDONS IN PRESTRESSED CONCRETE CONTAINMENT STRUCTURES) AND RG 1.90 (ISI OF PRESTRESSED CONCRETE CONTAINMENT STRUCTURES WITH GROUTED TENDONS).

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REMARKS

This previous Central File material can now be made publicly available.

MATERIAL RELATED TO CAER

MEETING NO. 191

CC (LIST ONLY) JEAN RATAJE,  
PDR L STREET

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MATERIAL RELATED TO CRGR MEETING NO. 191  
TO BE MADE PUBLICLY AVAILABLE

1. MEMO FOR J. TAYLOR FROM E. JORDAN DATED  
SUBJECT: MINUTS OF CRGR MEETING NUMBER  
INCLUDING THE FOLLOWING ENCLOSURES WHICH WERE NOT  
PREVIOUSLY RELEASED:

a. ENCLOSURE 2  
A SUMMARY OF DISCUSSIONS OF A PROPOSED Supplement 3  
to Generic Letter 89-10 on Motor Operated  
Valve Testing

b. ENCLOSURE 3  
A SUMMARY OF DISCUSSIONS OF A PROPOSED Regulatory  
Guide on Standard Format and Content for Licensing  
Renewal and Proposed Standard Review Plan for  
Licence Renewal

c. ENCLOSURE \_\_\_\_\_  
A SUMMARY OF DISCUSSIONS OF A PROPOSED

2. MEMO FOR E. JORDAN FROM E. Beckford DATED 8-31-90  
FORWARDING REVIEW MATERIALS ON A PROPOSED Draft Regulatory  
Guide on Standard Format and Content for License Renewal  
Applications and Draft Standard Review Plan for the Review  
of License Renewal Applications

3. MEMO FOR E JORDAN FROM \_\_\_\_\_ DATED \_\_\_\_\_  
FORWARDING REVIEW MATERIALS ON A PROPOSED

4. MEMO FOR E JORDAN FROM \_\_\_\_\_ DATED \_\_\_\_\_  
FORWARDING REVIEW MATERIALS ON A PROPOSED

22-141 50 SHEETS  
22-142 100 SHEETS  
22-144 200 SHEETS

