UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 3, 1997

MEMORANDUM TO: L. Joseph Callan
Executive Director for Operations

FROM: Denwood F. Ross, Jr., Chairman
Committee to Review Generic Requirements

SUBJECT: COMBINED MINUTES OF CRGR MEETING NUMBER 302 (Part I) and 303

The Committee to Review Generic Requirements (CRGR) met on Tuesday, February 25, 1997, from 9:00 a.m. to 12:00 p.m. for CRGR Meeting No. 302, and on March 11, 1997, from 9:00 a.m. to 3:45 p.m. for CRGR Meeting No. 303 A list of attendees for the two meetings is provided in Attachment 1-A and 1-B, respectively.

At the 302nd CRGR meeting, R. Jones (NRR), M. Cunningham (RES) and T. King (RES) presented for CRGR review and endorsement the general regulatory guide (DG-1061) and the associated Standard Review Plan (SRP) for the risk-based regulation. At the 303rd CRGR meeting, G. Holahan (NRR) and the staff presented for CRGR review and endorsement the appendices associated with the general regulatory guide, as well as the application-specific regulatory guides and the accompanying application-specific Standard Review Plans.

These combined minutes of the CRGR Meeting No. 302 (Part I) and of the CRGR Meeting No. 303 contain details only on the CRGR review of the general and the application-specifc risk-informed regulatory guides and the associated Standard Review Plans. Also at the 302nd CRGR meeting, R. Jones (NRR), J. Kudrick (NRR) and R. Lobel (NRR) presented for the CRGR review and endorsement the proposed generic letter on "Potential for Degradation of Emergency Core Cooling System Recirculation due to Construction Deficiencies and Foreign Material in the Containment Following a Loss-of-Coolant Accident." Part II of the minutes of CRGR Meeting No. 302, containing the details on this topic, were issued on April 3, 1997.

Previously, the Committee had the benefit of a briefing on the risk-informed guidance documents at the CRGR Meeting No. 294 on October 28, 1996. On November 12, 19 and 26, 1996, at the CRGR Meetings No. 295, 296 and 297, respectively, the staff presented for the CRGR review the earlier versions of the general regulatory guide (DG-1061) and the accompanying SRP, the regulatory guide and companion SRP on Inservice Testing (DG-1062), and the regulatory guide on Graded QA (DG-1064); no SRP exists for Graded QA. During these reviews, the Committee provided extensive comments to the staff. The versions presented for CRGR review and endorsement at the CRGR Meetings 302 and 303 on February 25 and March 11, 1997, respectively, were substantial rewrites from those earlier reviewed by the Committee.

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The CRGR commented on the extensive inter-office cooperative effort which was evident in the development of the general and the application-specific regulatory guides and the associated Standard Review Plans. The Committee commended the various office staff that had demonstrated a well-coordinated concerted effort in developing the extensive guidance for the industry and the staff on a complex subject within the realm of the PRA Implementation Plan for risk-informed regulation.

During the meetings, the CRGR made extensive comments on the specific documents to make an overall improvement in these documents. Broadly speaking, the Committee made the following general observations and recommended that the staff include them in the Commission paper:

1. **Fundamental Approach**

   The CRGR observed that these documents represented a measured step along the path towards risk-informed regulation. The CRGR recognizes that the allowable increases in risk are small. Thus, the approach proposed is essentially risk neutral within the error bands involved. This is especially relevant in that based on IPE submittals a number of reactors already exceed the subsidiary core damage frequency objective of 1E-4.

2. **Backfit Situation**

   The CRGR has the responsibility to review and recommend to the EDO approval or disapproval of requirements of staff positions to be imposed by the NRC staff on one or more classes of power reactors. It is the CRGR's understanding that these Regulatory Guides and the accompanying Standard Review Plans are not being imposed (i.e., there is no intent to backfit these provisions).

   The CRGR did not review any application or justification under 50.109, as none was tendered to us.

3. **Value-Added Role**

   The Commission has encouraged the CRGR to continue to exercise a value-added role (that is, above and beyond its strict Charter role) in its review. Accordingly, the CRGR offers the following opinions:

   a. Use of Small Numbers

   The CRGR observed that, in some applications of the general regulatory guide there would be utilization of small numbers, in the PSA space. For example, if a plant had a core damage frequency (CDF) in the vicinity of 1E-4/yr, there could be a limiting increase in CDF in the range of 1E-5 to 1E-6. Under the proposed new guidance, an increase in

CDF would be limited to 1E-6 under normal conditions; or, with increased technical and management review, an increase of 1E-5 might be permitted. In the limiting case, therefore, (i.e., in the near vicinity of CDF = 1E-4) CDF could increase from 9.8 to 9.9 x E-5 without special management consideration; or, with increased technical and management review, CDF might be permitted to increase from 8.9 to 9.9 x E-5. The Committee agrees with other experts that there is "difficulty in identifying very low frequency initiators in the range of 1E-6 per year or lower."

The Committee further notes that even with the small changes in absolute value of risk, the changes that could be made to the current licensing basis of a plant may be quite significant from an economic viewpoint. The Committee cautions on risk ranking schemes that may be used to valuate the risk significance of systems and/or components - one should not base decisions on the relative order of very low probability sequences.

b. Safety Goals

DG-1061 identifies the role of the Commission's Safety Goal Policy. In particular the guide states that the acceptance guidelines defined "are consistent with the Safety Goals and their subsidiary objectives and changes to the CLB are expected to result in changes in risk which do not exceed the goals and which are no more than a small fraction of these goals and objectives."

c. Monitoring Program

Although the Committee recognizes that monitoring is an important aspect of a performance-based risk-informed regulation approach, care should be taken not to specify the elements of a monitoring program so prescriptively. In that regard, in the proposed guidance documents the staff should consider simplifying the guidance provided on monitoring.

With the understanding that indeed the risk-informed decision process is voluntary, and that viable alternates or approaches remain available to the regulated industry, the CRGR has no objection to these documents going forward.

In accordance with the EDO's July 18, 1983 directive concerning "Feedback and Closure of CRGR Review," a written response is required from the cognizant office to report agreement or disagreement with the CRGR recommendations in these minutes. The response is to be forwarded to the CRGR Chairman and if there is disagreement with the CRGR recommendations, to the EDO for decision making.

Questions concerning these meeting minutes should be referred to either Jim Conran (415-1978) or Raji Tripathi (415-7584).

Attachments: As stated

cc: Commission (5)
SECY
J. Lieberman, OE
E. Halman, ADM
H. Bell, OIG
K. Cyr, OGC
J. Larkins, ACRS
Office Directors
Regional Administrators, RI/RII/RIII/RIV
CRGR Members
G. Holahan, NRR
W. Hodges, RES

Distribution of Minutes for CRGR Meetings 302 (Part II) and 303 See next page

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Attachment 1-A to the Combined Minutes of CRGR Meeting No. 302 and 303

Attendance List at the CRGR Meeting No. 302

February 25, 1997

CRGR Members

D. Ross
F. Miraglia
M. Knapp
J. Murphy
D. Dambly
K. Perkins

CRGR Staff

R. Tripathi

NRC Staff

R. Jones
T. King
M. Cunningham
M. Cheok
T. Hiltz
M. Rubin
A. Ramey smith
G. Parry
R. Gramm
R. Woods
S. Dinsmore
A. El-Bassioni
B. Sheron
W. Hodges
J. Conran
R. Sherry
R. Lobel
M. Marshall
R. Elliott
W. Burton
J. Shapaker
A. Serkiz
J. Kudrik

ACRS Staff

M. Markley

Attachment 1-B to the Combined Minutes of CRGR Meeting No. 302 and 303

Attendance List at the CRGR Meeting No. 303

March 11, 1997

CRGR Members

D. Ross
F. Miraglia
J. Austen for M. Knapp
J. Murphy
D. Dambly
T. Gwynn for K. Perkins

CRGR Staff

J. Conran
R. Tripathi (by telephone)

NRC Staff

G. Holahan
R. Jones
T. King
M. Cunningham
M. Cheok
T. Hiltz
D. Fischer
M. Cunningham
J. Rosenthal
G. Milman
A. El-Bassioni
B. Hardin
R. Woods
W. Hodges
J. Miller
S. Black
S. Dinsmore
J. Flack
A. Ramey-Smith
M. Rubin
M. Wohl
L. Spessard
R. Gramm
N. Giles
M. Cheok

Attachment 2 to the Combined Minutes of CRGR Meeting No. 302 and 303

Draft Regulatory Guides and the
Accompanying Standard Review Plans for Risk-Informed Regulation
(CRGR Meeting No. 302 (Part II) and Meeting No. 303
February 25 and March 11, 1997, respectively)

TOPIC

CRGR review and endorsement of the revised general regulatory guide and also the application-specific guidance documents - Inservice Testing, Technical Specifications and Graded Quality Assurance - as well as the associated Standard Review Plans for risk-informed regulation.

BACKGROUND

(i) Memorandum dated February 18, 1997, from F. J. Miraglia to D. F. Ross, "Transmittal of Revised General Regulatory Guide (DG-1061) and Standard review plan (Chapter 19) for Risk-Informed regulation." This package (CRGR Item No. 155) was distributed to the members on February 19, 1997. The attachments included:

1. The general Regulatory Guide (DG-1061), "An Approach for using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Current Licensing Basis," dated February 18, 1997

2. Standard Review Plan, "Use of Probabilistic Risk Assessment in Plant-Specific, Risk-Informed Decision Making: General Guidance," Appendices for Draft SRP Chapter 19, Revision K.1, dated February 25, 1997

(ii) Memorandum dated February 25, 1997, from F. J. Miraglia to D. F. Ross, "Transmittal of Risk-Informed, Application-Specific Guidance Documents and Appendices to the Risk-Informed Guidance Documents." This package (CRGR Review Material item No. 156) was distributed to the members on February 26, 1997. The attachments included:

1. Appendices A and B to the general Regulatory Guide (DG-1061), Unspecified revision

2. Standard Review Plan, "Use of Probabilistic Risk Assessment in Plant-Specific, Risk-Informed Decision Making: General Guidance," Appendices for Draft SRP Chapter 19, Revision K.1, darted February 25, 1997

3. Draft Regulatory Guide, "An Approach for Plant-Specific, Risk-Informed Decision Making: Technical Specifications," DG-1065, Revision 5

4. Draft SRP Chapter 16.1, "Risk-Informed Decision Making: Technical Specifications," Revision 12, dated February 24, 1997.

5. Draft Regulatory Guide, "An Approach for Plant-Specific, Risk-Informed Decision Making: Graded Quality assurance," DG-1064, Revision 4, dated February 26, 1997.

6. Draft Regulatory Guide, "An Approach for Plant-Specific, Risk-Informed Decision Making: Inservice Testing," DG-1062, Revision Unspecified, dated February 25, 1997.

7. Draft SRP Chapter 3.9.7, "Standard Review Plan for the Review of Risk-Informed Inservice Testing Applications," Revision 2C, dated February 25, 1997.

Attachments 2-A and 2-B include the presentation material used by the staff at the CRGR meeting No. 302 and 303, respectively.

ISSUES/QUESTIONS

On October 28, 1996, during Meeting No. 294., the CRGR was briefed by the staff on five regulatory guides on PRA applications and the associated SRPs. On November 12, 19 and 26, 1996, at the subsequent three CRGR meetings, the staff presented for the CRGR review the general regulatory guide (DG-1061) and the accompanying SRP, the regulatory guide and companion SRP on inservice testing (DG-1062), and the regulatory guide on Graded QA (DG-1064); no SRP exists for Graded QA. During the meetings, the CRGR made extensive comments on the specific documents to make an overall improvement in these documents. The Committee commented extensively on the scope and the staff's approach in development of these documents, and, also on technical and policy issues and the risk/safety perspectives used therein (e.g., mandatory application of the proposed probabilistic acceptance criteria delineated in the SRP in the review of licensee-initiated requests to modify the current licensing basis; the staff's use of 1E(-05) large-early-release-frequency (LERF) as an "approved" surrogate for the Commission Safety Goals).

The Committee decided not to review the associated NUREG-1602, "Standards for Probabilistic Risk Analyses (PRA) to Support Risk-Informed Decisionmaking," as the staff agreed to excerpt relevant portions of this NUREG into an Appendix to the general regulatory guide. The Committee also deferred the review of the regulatory guide and the SRP on Technical Specifications at a later date when these documents are concurred on at least at the Division Director level in RES and NRR, and have had OGC review. Additionally, the Committee noted that various comments and recommendations made in the context of the review of other regulatory guides (and the associated SRPs) were also applicable to the one on Technical Specifications, and that subsequent revision to this regulatory guide and the companion SRP should address applicable comments made by the Committee on the other regulatory guides and SRPs. The staff also agreed to address the Committee's comments and revise the documents prior to submittal for NRR, RES and OGC concurrence.

Subsequently, the versions presented for CRGR review and endorsement at the CRGR Meetings 302 and 303 on February 25 and March 11, 1997, respectively, were substantial rewrites. These versions addressed various CRGR recommendations on the scope and the staff's approach in development of these documents, and, also on technical and policy issues and the risk/safety perspectives used therein. These documents also had OGC concurrence.

The CRGR commented on the extensive inter-office cooperative effort which was evident in the development of the general and the application-specific regulatory guides and the associated Standard Review Plans. The Committee commended the various office staff that had demonstrated a well-coordinated concerted effort in developing the extensive guidance for the industry and the staff on a complex subject within the realm of the PRA Implementation Plan for risk-informed regulation.

During the meetings, the CRGR made extensive comments on the specific documents to make an overall improvement in these documents. Broadly speaking, the Committee made the following general observations and recommended that the staff include them in the Commission paper:

1. **Fundamental Approach**

   The CRGR observed that these documents represented a measured step along the path towards risk-informed regulation. The CRGR recognizes that the allowable increases in risk are small. Thus, the approach proposed is essentially risk neutral within the error bands involved. This is especially relevant in that based on IPE submittals a number of reactors already exceed the subsidiary core damage frequency objective of 1E-4.

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   The CRGR has the responsibility to review and recommend to the EDO approval or disapproval of requirements of staff positions to be imposed by the NRC staff on one or more classes of power reactors. It is the CRGR's understanding that these Regulatory Guides and the accompanying Standard Review Plans are not being imposed (i.e., there is no intent to backfit these provisions).

3. **Value-Added Role**

   The Commission has encouraged the CRGR to continue to exercise a value-added role (that is, above and beyond its strict Charter role) in its review. Accordingly, the CRGR offers the following opinions:

   a. Use of Small Numbers

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c. Monitoring Program

Although the Committee recognizes that monitoring is an important aspect of a performance-based risk-informed regulation approach, care should be taken not to specify the elements of a monitoring program so prescriptively. In that regard, in the proposed guidance documents the staff should consider simplifying the guidance provided on monitoring.

With the understanding that indeed the risk-informed decision process is voluntary, and that viable alternates or approaches remain available to the regulated industry, the CRGR has no objection to these documents going forward.

BACKFIT CONSIDERATIONS

It is the CRGR's understanding that these RGs and the accompanying SRPs are not being imposed (i.e., there is no intent to backfit these provisions). The CRGR did not review any application or justification under 50.109, as none was tendered to us.

Attachment 2-A to the Combined Minutes of
CRGR Meeting No. 302 (Part II) and 303

Presentation material used by the Staff at the CRGR Meeting No. 302

United States
Nuclear Regulatory Commission

RISK-INFORMED REGULATION GENERAL REG GUIDE AND STANDARD REVIEW PLAN (DG-1061 AND SRP-CHAPTER 19)

Gary Holahan, NRR
Thomas King, RES
Robert Jones, NRR
Mark Cunningham, RES

Presentation to CRGR
February 25, 1997

INTRODUCTION

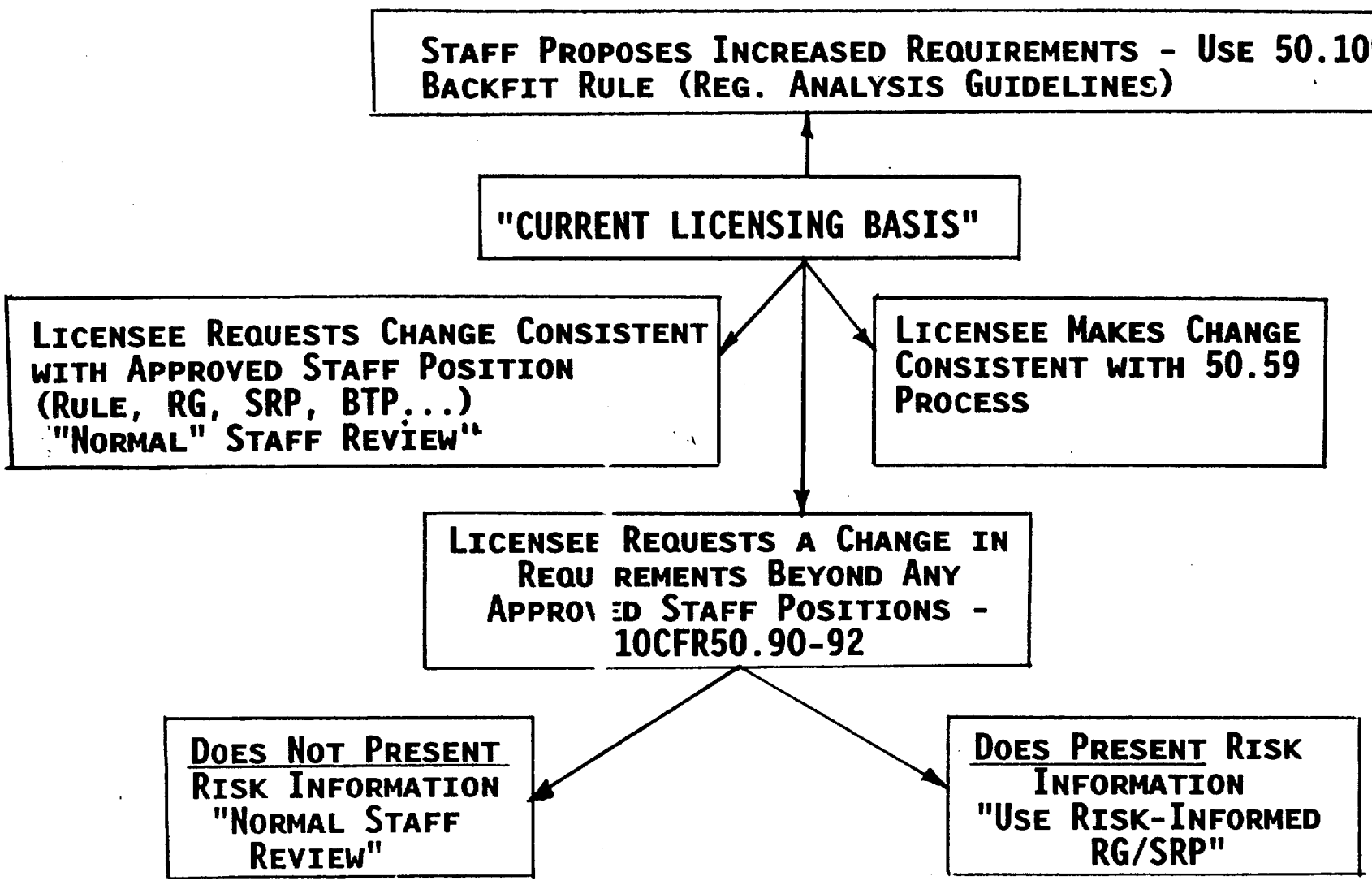
- FOLLOWING ISSUANCE OF THE COMMISSION'S POLICY STATEMENT ON PRA, DRAFT RGS AND SRPS HAVE BEEN PREPARED TO:
  - PROVIDE GUIDANCE ON AN ACCEPTABLE METHOD AND PROCESS FOR CONSIDERING RISK INFORMATION IN PLANT SPECIFIC CHANGES TO THE CURRENT LICENSING BASIS (CLB)
  - ENCOURAGE LICENSEES AND STAFF TO UTILIZE RISK INFORMATION TO:
    - IMPROVE DECISION MAKING
    - BETTER UTILIZE RESOURCES
    - REDUCE UNNECESSARY BURDEN
- RG AND SRPS COVER:
  - GENERAL GUIDANCE ON PROCESS, GUIDELINES, DOCUMENTATION
  - SPECIFIC GUIDANCE FOR TECH SPECS, IST, GRADED QA, ISI (ON A LATER SCH)
- USE OF RISK INFORMATION AND RGS/SRPS IS VOLUNTARY ON LICENSEES:
  - REPRESENTS ANOTHER ACCEPTABLE WAY TO CHANGE THE CLB (I.E., IMPLEMENT 10CFR50.90-92), NOT AN ADDITIONAL BURDEN

INTRODUCTION (CONTINUED)

- IS NOT A BACKFIT
- STAFF WILL UTILIZE RISK INFORMATION, WHERE APPROPRIATE, IN ITS REVIEWS AND WILL GIVE PRIORITY TO APPLICATIONS FOR BURDEN REDUCTION THAT UTILIZE RISK INFORMATION

- POLICY ISSUES:
  - ROLE OF PERFORMANCE BASED REGULATION
  - PLANT SPECIFIC APPLICATION OF SAFETY GOALS
  - RISK NEUTRAL VS. INCREASES IN RISK
  - IMPLEMENTATION OF CHANGES TO RISK-INFORMED IST AND ISI

Changes to the Current Licensing Basis



CONTENT OF GENERAL RG/SRP

- Four Step Process Described in general RG/SRP:
  - DEFINE CHANGE
  - ENGINEERING EVALUATION - TRADITIONAL
    - PROBABILISTIC
    - INTEGRATED DECISION MAKING
  - MONITORING AND FEEDBACK
  - DOCUMENTATION AND SUBMITTAL
- Appendices and Reference Documents
  - General RG
    - Appendix A - Categorization of SSCs - Safety Significance
    - Appendix B - An approach for Estimating Early Containment Failure and Bypass Frequency
    - Reference Doc - Draft NUREG-1602-Supplemental Info on Scope and Quality of a PRA
  - General SRP
    - Appendix A - Guidance on Focused Scope Application Specific Review
    - Appendix B - Integrated Decision Making
    - Appendix C - Categorization of SSCs - Safety Significance

Overall Approach

- Define proposed change
- Demonstrate that certain fundamental safety principles are met:
  - meet regulations (or propose a change/exemption)
  - maintain defense-in-depth
  - maintain sufficient safety margin
  - increases in risk and their cumulative effect are small and do not cause the safety goals to be exceeded
  - implement utilizing performance-based monitoring and feedback strategies
- Expectations on implementation:
  - assess all safety impacts
  - scope of analysis supporting the change should cover all SSCs, operating modes, initiators affected by the change and reflect the as-built, as-operated plant

OVERALL APPROACH (CONT)

- SUBSIDIARY OBJECTIVES OF COMMISSION'S SAFETY GOAL POLICY USED TO DEFINE BENCHMARK RISK LEVELS FOR DECISION MAKING:

  - 10^{-4}/RY - CORE DAMAGE FREQUENCY (CDF)
  - 10^{-5}/RY - LARGE EARLY RELEASE FREQUENCY (LERF)

- PROPOSED CLB CHANGES SHOULD BE MADE IN SMALL INCREMENTS (<10% OF BENCHMARK CDF/LERF VALUES) AND WHEN WITHIN A FACTOR OF 10 OF THE BENCHMARK VALUES, MORE ANALYSIS AND MANAGEMENT REVIEW WILL BE NECESSARY.

- SUPPLEMENTAL GUIDANCE IN APPLICATION SPECIFIC RG/SRPs

- PERFORM UNCERTAINTY/SENSITIVITY ANALYSIS APPROPRIATE FOR PROPOSED CHANGE

- PERFORM QUALITY ANALYSES AND MAKE IT AVAILABLE FOR PUBLIC REVIEW

- PERFORMANCE MUST BE MONITORED TO HELP VERIFY KEY ASSUMPTIONS AND CHECK AREAS OF LARGE UNCERTAINTY

- DOCUMENTATION

BACKUP INFORMATION

- Guidelines on Maintaining Defense-in-Depth
- Guidelines on Maintaining Sufficient Safety Margin
- CDF
- LERF

DEFENSE-IN-DEPTH

- ELEMENTS OF DEFENSE-IN-DEPTH:

  - A REASONABLE BALANCE AMONG PREVENTION OF CORE DAMAGE, PREVENTION OF CONTAINMENT FAILURE, AND CONSEQUENCE MITIGATION IS PRESERVED

  - OVER-RELIANCE ON PROGRAMMATIC ACTIVITIES TO COMPENSATE FOR WEAKNESSES IN PLANT DESIGN IS AVOIDED

  - SYSTEM REDUNDANCY, INDEPENDENCE, AND DIVERSITY ARE MAINTAINED COMMENSURATE WITH THE EXPECTED FREQUENCY AND CONSEQUENCES OF CHALLENGES TO THE SYSTEM (E.G., NO RISK OUTLIERS)

  - DEFENSES AGAINST POTENTIAL COMMON CAUSE FAILURES ARE MAINTAINED AND THE POTENTIAL FOR INTRODUCTION OF NEW COMMON CAUSE FAILURE MECHANISMS IS ASSESSED

  - INDEPENDENCE OF BARRIERS IS NOT DEGRADED

  - DEFENSES AGAINST HUMAN ERRORS ARE MAINTAINED

DEFENSE-IN-DEPTH (CONT)

- GUIDELINES FOR APPLICATION OF DEFENSE-IN-DEPTH PRINCIPLE:

  - RELY ON TRADITIONAL ENGINEERING JUDGMENT FOR AREAS OF LARGE UNCERTAINTY OR AREAS NOT COVERED BY RISK ANALYSIS

  - USE RISK INSIGHTS, WHERE SUPPORTED BY APPROPRIATE RISK ANALYSES, TO HELP GUIDE APPLICATION OF DID AND PROVIDE BASES FOR DEMONSTRATING ADEQUATE DID IS MAINTAINED

SAFETY MARGINS

- GUIDELINES FOR MAINTAINING SUFFICIENT SAFETY MARGINS:
  - CODES AND STANDARDS OR ALTERNATIVES APPROVED FOR USE BY THE NRC ARE MET
  - SAFETY ANALYSIS ACCEPTANCE CRITERIA IN THE CURRENT LICENSING BASIS (E.G., FSAR, SUPPORTING ANALYSES) ARE MET, OR PROPOSED REVISIONS PROVIDE SUFFICIENT MARGIN TO ACCOUNT FOR ANALYSIS AND DATA UNCERTAINTY
- MARGINS CAN BE MEASURED BY TRADITIONAL ENGINEERING ANALYSIS AND CRITERIA
- RESULTS FROM RISK ASSESSMENT AND ITS ASSOCIATED UNCERTAINTY ANALYSIS CAN PROVIDE USEFUL INFORMATION TO AID IN DECISION MAKING

CDF GUIDELINES

- A VALUE OF 10^{-4}/RY IS RECOMMENDED AS A BENCHMARK CDF GUIDELINE, ALONG WITH A REGION OF INCREASED MANAGEMENT ATTENTION WHEN CDF IS IN THE RANGE OF 10^{-5} - 10^{-4}/RY

  - BASED UPON VALUE APPROVED BY COMMISSION AS A BENCHMARK FOR ACCIDENT PREVENTION

  - ▲CDF GUIDELINE OF 10^{-5}/RY CONSISTENT WITH NRC'S REGULATORY ANALYSIS GUIDELINES (RAG) (NUREG/BR-0058, REV. 2)

LERF GUIDELINE

- A VALUE OF 10^{-5}/RY IS RECOMMENDED AS A BENCHMARK LERF GUIDELINE, ALONG WITH A REGION OF INCREASED MANAGEMENT ATTENTION WHEN LERF IS IN THE RANGE 10^{-6} - 10^{-5}/RY.

  - BASED UPON PROVIDING REASONABLE ASSURANCE THAT SAFETY GOAL QHO'S ARE MET, WITHOUT BEING A DE FACTO NEW GOAL
  - CONSISTENT WITH CONCLUSIONS OF PREVIOUS ANALYSIS ON 10^{-6}/RY LARGE RELEASE GUIDELINE
  - CONSISTENT WITH COMMISSION APPROVED 10^{-4}/RY CDF AND 0.1 CCFP SAFETY GOAL SUBSIDIARY OBJECTIVES
  - ▲LERF GUIDELINE OF 10^{-6}/RY CONSISTENT WITH RAG.

- SINGLE VALUE CHOSEN TO:

  - ALLOW USE OF LEVEL 1 AND 2 PRA ONLY
  - AVOID UNCERTAINTY ASSOCIATED WITH LEVEL 3 ANALYSIS
  - BE CONSISTENT WITH PERVIOUS COMMISSION DIRECTION TO DECOUPLE SITING FROM PLANT DESIGN
  - PROVIDE UNIFORM AND CONSISTENT GUIDELINES TO ALL PLANTS

Attachment 2-B to the Combined Minutes of
CRGR Meeting No. 302 and 303

Presentation material used by the staff at the CRGR meeting No. 303

United States
Nuclear Regulatory Commission

REGULATORY GUIDES AND STANDARD REVIEW PLANS IN SUPPORT OF RISK INFORMED REGULATION

PRESENTATION TO CRGR MARCH 11, 1997

Gary Holahan, NRR (415-2884)
Thomas King, RES (415-5790)
Robert Jones, NRR (415-2198)
Mark Cunningham, RES (415-6189)

INTRODUCTION

- FOLLOWING ISSUANCE OF THE COMMISSION'S POLICY STATEMENT ON PRA, DRAFT R.G.S AND SRPS HAVE BEEN PREPARED TO:
  - PROVIDE GUIDANCE ON AN ACCEPTABLE METHOD AND PROCESS FOR CONSIDERING RISK INFORMATION IN PLANT SPECIFIC CHANGES TO THE CURRENT LICENSING BASIS (CLB)
  - ENCOURAGE LICENSEES AND STAFF TO UTILIZE RISK INFORMATION TO:
    - IMPROVE DECISION MAKING
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    - REDUCE UNNECESSARY BURDEN
- DRAFT R.G.S AND SRPS COVER:
  - GENERAL GUIDANCE ON PROCESS, GUIDELINES, DOCUMENTATION
  - SPECIFIC GUIDANCE FOR TECH SPECS, IST, GRADED QA
  - ISI ON A LATER SCHEDULE

INTRODUCTION (CONTINUED)

- DRAFT NUREG (NUREG-1602) ALSO PREPARED AS REFERENCE DOCUMENT ON SCOPE AND QUALITY OF PRA
- ACRS REVIEW COMPLETED.
- CRGR REVIEW:
  - 2/25/97 - GENERAL R.G. (DG-1061)/SRP (MINUS APPENDICES)
  - 3/11/97 - APPENDICES TO GENERAL R.G.+SRP
    - IST R.G. (DG-1062) AND SRP
    - TECH SPEC R.G. (DG-1065) AND SRP
    - GRADED QA R.G. (DG-1064)

GENERAL RG (DG-1061) APPENDICES

- **APPENDIX A** - "CATEGORIZATION OF SSCs - SAFETY SIGNIFICANCE"
  - PURPOSE - TO PROVIDE GUIDANCE ON IMPORTANT FACTORS RELATED TO CATEGORIZATION OF SSCs INTO GROUPS WHERE REQUIREMENTS CAN BE RELAXED AND THOSE WHERE NO RELAXATION SHOULD BE MADE
  - CONTENT - FACTORS TO BE CONSIDERED
  - RELATED TO SRP APPENDIX C.
- **APPENDIX B** - "AN APPROACH FOR ESTIMATING CONTAINMENT FAILURE AND BYPASS FREQUENCY"
  - CONTENT: - GUIDANCE FOR ESTIMATING LERF WHEN ONLY LEVEL 1 PRA INFO IS AVAILABLE.
  - SCOPE: INTERNAL EVENTS/FULL POWER OPERATION

GENERAL R.G. - APPD. B

- SEPARATE SECTION FOR EACH CONTAINMENT TYPE
- FOR EACH ACCIDENT SEQUENCE LEADING TO CORE DAMAGE OR BYPASS:
  - YES OR NO ANSWERS TO A SET OF QUESTIONS (BASED UPON NUREG-1150 AND LASALLE LEVEL 2 ANALYSES) DEFINE A PATH THRU EVENT TREE
  - GUIDANCE PROVIDED ON FREQUENCY TO BE APPLIED AT EACH BRANCH POINT
- LERF CONSISTS OF CUMULATIVE FREQUENCY OF UNMITIGATED RELEASES
- TRIAL APPLICATION OF METHOD
- FUTURE ACTIVITIES:
  - DEVELOP A NUREG/CR DOCUMENTING BASIS FOR APPD B
  - EXPAND TO COVER SHUTDOWN CONDITIONS AND EXTERNAL EVENTS

Comparison of Different Estimates of LERF

		Surry (sub-atmospheric)	Sequoyah (ice condenser)	Peach Bottom (Mark I)	Grand Gulf (Mark III)
IPE Submittal	Core Damage Frequency	7.4E-5	1.7E-4	5.5E-6	1.6E-5
	Bypass and Early Failure	1.4E-5	1.2E-5	1.6E-6	8.1E-6
	Large and Early Release I, Te, Cs>0.03	1.3E-5	1.1E-5	2.6E-7	6.0E-6
	Large and Early Release I, Te, Cs>0.1	1.1E-5	8.0E-6	5.8E-8	5.9E-7
Simplified Event Trees		1.6E-5	7.8E-6	4.2E-6	3.4E-6

GENERAL SRP APPENDICES

R. Jones

The SRP contains three appendices:

- Appendix A - Guidance for a focused-scope application specific PRA review
- Appendix B - Integrated decisionmaking
- Appendix C - Categorization of SSCs with respect to safety significance

Appendix A: Guidance for a Focused-Scope Review

- PRAs that are used in risk-informed applications are expected to be of adequate quality
- Quality may be accomplished in various ways such as a peer review
- Staff will perform a focused-scoped review on an application-specific basis

Application-specific reviews are expected to focus on:

- Use of appropriate data
- Effects of the application on initiating events
- Effects of mission success criteria on conclusions
- Modeling of common cause failures and how this affects or is affected by the application
- Modeling of human performance and how this affects or is affected by the application
- Effects of truncation limits used

Integrated decisionmaking should:

- consider probabilistic and traditional engineering evaluations, operational experience, and current regulatory requirements
- be systematic and defensible, and documentation should be available for review
- be based on a technical information basis that is adequate for the scope of the application

In SSC categorization, the following has to be taken into account:

- **Risk in terms of both CDF and LERF**
- **Completeness of risk model**
- **Sensitivity analysis for component data uncertainties, common cause failures, and recovery actions**
- **Consideration of multiple failure modes**
- **Multiple component considerations**
- **Relationship of importance measures to risk changes**

United States
Nuclear Regulatory Commission

RISK-INFORMED INSERVICE TESTING REGULATORY GUIDE (DG-1062) AND STANDARD REVIEW PLAN (3.9.7)

Committee to Review Generic Requirements
March 11, 1997

David C. Fischer
W. Brad Hardin

RISK-INFORMED INSERVICE TESTING REGULATORY GUIDE AND STANDARD REVIEW PLAN DEVELOPMENT TEAM

David C. Fischer	**co-Team Leader**	**NRR/DE/EMEB**
W. Brad Hardin	**co-Team Leader**	**RES/DST/PRAB**
Michael C. Cheok		**NRR/DSSA/SPSB**
Joseph Colaccino		**NRR/DE/EMEB**

MANAGEMENT TEAM

Richard H. Wessman	**NRR/DE/EMEB**
Mark A. Cunningham	**RES/DST/PRAB**
Robert C. Jones	**NRR/DSSA**

BRIEFING TOPICS

- **RI-IST team objective**
- **"Classical" IST approach**
- **RI-IST approach**
- **Essential elements of Regulatory Guide (RG) and Standard Review Plan (SRP)**
- **Status of pilot plant reviews**
- **Backfit considerations**

RI-IST TEAM OBJECTIVES

- **Provide acceptable approach and Guidance to industry for developing and submitting optional RI-IST program**

- **Provide guidance to staff for reviewing RI-IST submittals**

- **Review RI-IST pilot plant program submittals**

RI-IST TEAM OBJECTIVES (cont'd)

ACCOMPLISHMENTS:

- **Draft Regulatory Guide DG-1062: "An Approach for Plant Specific, Risk-Informed, Decision Making: Inservice Testing"**
- **Draft SRP Section 3.9.7: "Standard Review Plan for the Review of RI-IST Applications"**
- **Initial review of pilot applications complete**

FUTURE ACTIONS:

- **Pilot plant reviews to be completed by 6/97**
- **Continue interaction with ASME on IST code cases**

"CLASSICAL" IST APPROACH

- **ASME Code referenced in 10 CFR 50.55a**

- **Program scope includes ASME safety-related code class pumps and valves**

- **Like components subjected to prescriptive testing requirements regardless of safety significance**

- **Changes in test interval or acceptance criteria reviewed and approved by staff (relief requests)** or authorized alternatives

- **NRC-endorsed code cases provide clarification of, or alternatives to, code requirements**

RI-IST APPROACH

- **Start by ensuring that the plant design and operation is in accordance with the current licensing basis (CLB)**
- **Ensure that the PRA reflects the actual plant**
- **Establishes RI-IST program using traditional engineering evaluation, PRA insights, and integrated decision making**
- **Components categorized as either high or low safety significant (HSSC or LSSC)**
- **RI-IST program scope may include non-code components that are HSSC or LSSC**
- **Changes to CLB are identified and justified (defense in depth and safety margins maintained)**

RI-IST APPROACH (cont'd)

- **Test strategy relaxations and possible improvements considered**
- **Overall effect on plant risk is estimated**
- **Allows licensee to focus resources commensurate with safety significance**
- **Step-wise implementation plan**
- **Performance monitoring and feedback ensures potential problems are promptly detected and corrected**
- **Regulatory approval would be an alternative to the Code requirements, as allowed by 10 CFR 50.55a(a)(3)(i)**

ESSENTIAL ASPECTS OF RI-IST REGULATORY GUIDE:

DG-1062 gives guidance on acceptable methods for utilizing PRA information together with established traditional engineering information in the development of IST programs that have improved effectiveness regarding the utilization of plant resources while still maintaining acceptable levels of quality and safety. Consistent with DG-1061 while providing additional application-specific guidance.

ESSENTIAL ASPECTS OF RI-IST STANDARD REVIEW PLAN:

SRP Section 3.9.7 provides review procedures and acceptance guidelines for staff reviews. Review procedures are consistent with acceptable methods for implementing a risk-informed inservice testing program. Consistent with SRP Chapter 19 while providing additional application-specific guidance.

ELEMENT 1: DEFINE THE PROPOSED CHANGES TO THE IST PROGRAM

- **Identify proposed changes to the current licensing basis (CLB)**

- **Identify components within the scope of the RI-IST program**

- **Identify changes to existing test schedules and methods**

- **Identify necessary information and analyses to support change**

ELEMENT 2: GUIDANCE FOR ENGINEERING EVALUATION

- **Traditional engineering evaluation (Ensures that the plant is designed and operated in accordance with the CLB)**

- **Probabilistic risk assessment (PRA reflects actual plant)**

- **Integrated decision making**

- **Key principles addressed:**
  - **The proposed change meets the current regulations.**
  - **Defense in depth is maintained.**
  - **Sufficient safety margins are maintained.**
  - **Proposed increases in risk, and their cumulative effect, are small and do not cause the NRC Safety Goals to be exceeded.**

ELEMENT 2: GUIDANCE FOR ENGINEERING EVALUATION (cont'd)

- **PRA used to identify pumps and valves that are candidates for relaxation of IST as well as candidates for enhanced testing**

- **Assess change in plant risk from overall change in test frequency or method**

- **Expect consideration of common cause failures, results from sensitivity evaluations, human reliability, defense in depth, and safety margin**

- **Acceptable plant risk change criteria, uncertainty, and sensitivity analysis in accordance with DG-1061.**

ELEMENT 2: GUIDANCE FOR ENGINEERING EVALUATION (cont'd)

- **Consider cumulative effects of RI-IST in relation to other initiatives**

- **Licensee expected to review existing approved IST relief requests, maintenance and outage planning, TS, etc.**

ELEMENT 3: IMPLEMENTATION, PERFORMANCE MONITORING AND CORRECTIVE ACTION

- **HSSC typically tested using Code test frequency and method**
- **LSSC typically tested at extended interval (up to a maximum limit)**
- **Expect use of NRC endorsed ASME code cases**
- **Phased implementation of RI-IST program**
- **Monitor component performance to:**
  1) identify degradation (sufficiently early to correct)
  2) initiate appropriate corrective action
  3) adjust test frequency based on results
- **Periodic reassessment of program**
- **Key principle addressed: Performance-based implementation and monitoring strategies**

Element 4: DOCUMENTATION

- **Provide guidance to licensees on minimum documentation necessary to evaluate submittal**

- **Must show that proposed CLB change is consistent with the key principles of risk-informed regulation and NRC staff expectations**

- **Provide guidance on PRA records and supporting data to be maintained at the licensee's facility**

- **Provide guidance on maintenance of ASME Code test records and component test interval schedules to support RI-IST**

CURRENT EXPERIENCE WITH RI-IST PILOT PLANTS

- **Initial submittals made November 1995**

- **Summary of components included in each pump RI-IST Program:**

Comanche Peak	HSSC	LSSC	TOTAL
pumps	21	12	33
valves	118	516	634
Palo Verde:			
valves	152	350	502

- **Licensee estimates of change in risk:**

	Baseline CDF	Baseline LERF	ΔCDF	ΔLERF
Comanche Peak	5.7E-5/RY	7.8E-7/RY	7E-6/RY	1.0E-7/RY
with compensatory measures:			8E-7/RY	1.3E-8/RY
Palo Verde	4.7E-5/RY	2.1E-6/RY	3.8E-6/RY	3.8E-6/RY

ISSUES TO BE RAISED WITH PILOT PLANTS IN ADDITIONAL RAIS

- Methods to improve (or make more realistic) the determination of baseline CDF, LERF, ΔCDF, and ΔLERF
- Affect of the proposed RI-IST Program change on the current licensing basis
- Explicitely address the five key safety principles
- Details of the licensee's integrated decision making process
- Detailed implementation plans for components (or groups of components)
  - Step-wise approach
  - Consideration of performance history and service condition
  - ORNL review of NPRDS data
- Performance monitoring and corrective action plans

Backfit Considerations

- PRA is used to categorize components and to assess the overall change in risk associated with the RI-IST program
- PRA assumptions regarding component reliability and unavailability must be preserved
- In addition to taking credit for (most) Code SSCs, PRA systematically takes credit for certain non-Code SSCs as: 1) providing support to, 2) alternatives to, and 3) back-ups for SSCs within the scope of the current Code
- Relaxations of Code-required test requirements relies on proper operation and reliability of non-Code components categorized as HSSC
- Non-Code components, identified through application of the PRA, may need to be included in the RI-IST program
- Test strategies may need to be evaluated (test methods and frequency)

Backfit Considerations (Continued)

- **RI-IST program implementation is voluntary**
- **RI-IST RG and SRP outline an acceptable approach for using PRA to help define IST program requirements; licensees may propose other approaches**
- **RI-IST programs is a new way of defining IST program requirements, not just adding on to the traditional Code-specified IST requirements**
- **RI-IST program, if properly constructed, should result in a net improvement in safety and burden reduction**

RISK-INFORMED TECHNICAL SPECIFICATIONS

DRAFT REGULATORY GUIDE & STANDARD REVIEW PLAN

COMMITTEE TO REVIEW GENERIC REQUIREMENTS

MARCH 11, 1997

Roy Woods, RES/PRAB
Nanette Gilles, NRR/TSB
Millard Wohl, NRR/SPSB

Four-Element Approach to Integrated Decision Making
Element 1: Define the Proposed Change

- Changes to allowed outage times (AOTs) & surveillance test intervals (STIs)

- Licensee must demonstrate need for request

  - Improvement in operational safety
  - Consistency of risk basis in requirements
  - Reduction of unnecessary burden

Element 2: Conduct Engineering Evaluations
Principle #1: Proposed Change Meets Current Regulations

- TS Rule: 10 CFR 50.36
- License Amendments: 10 CFR 50.90, 50.91, 50.92

Element 2: Conduct Engineering Evaluations
Principle #2: Maintain Defense-in-Depth

- Maintain system redundancy, independence, & diversity commensurate with expected frequency & consequences of challenges to system
- Avoid over-reliance on programmatic activities to compensate for weaknesses in plant design
- Maintain defenses against potential common cause failures and human errors

Element 2: Conduct Engineering Evaluations
Principle #3: Maintain Sufficient Safety Margins

- AOT or STI change is not in conflict with approved codes and standards relevant to subject system
- AOT or STI change does not adversely affect any assumptions or inputs to safety analysis or, if affected, justification is provided to ensure sufficient safety margin will continue to exist

Element 2: Conduct Engineering Evaluations
Principle #4: Changes in risk are small and Safety Goals are not exceeded

- Three-tiered approach to risk-informed technical specification AOT evaluations
  - ▸ Tier 1: upper bound guidelines on quantitative risk measures
  - ▸ Tier 2: avoidance of risk-significant plant configurations
  - ▸ Tier 3: risk-informed plant configuration control

Element 2: Conduct Engineering Evaluations
Principle #4: Changes in risk are small and Safety Goals are not exceeded

- Tier 1 acceptance guidelines
  - ▸ General RG guidelines for CDF/ΔCDF & LERF/ΔLERF
  - ▸ Additional guidelines for technical specification AOT changes:
    - very small incremental conditional core damage probability (ICCDP) (≤ 5.0E-7)
    - very small incremental conditional large early release probability (ICLERP) (≤ 5.0E-8)

Element 2: Conduct Engineering Evaluations
Principle #4: Changes in risk are small and Safety Goals are not exceeded

- Tier 2 acceptance guideline: Demonstrate appropriate restrictions on dominant risk-significant configurations associated with the change

- Tier 3 acceptance guideline: Implement a risk-informed plant configuration control program & procedures to utilize & maintain the program

Element 3: Develop Implementation & Monitoring Strategies
Principle #5: Propose performance-based implementation and monitoring strategies

- Three-tiered implementation approach
- Monitoring through Maintenance Rule

Element 4: Submit Proposed Change

- Description of & reasons for change
- Traditional engineering evaluations performed & results
- PRA evaluations performed & results
- Description of process to meet three-tiered approach

GRADED QUALITY ASSURANCE REGULATORY GUIDE

PRESENTATION TO THE COMMITTEE TO REVIEW GENERIC REQUIREMENTS

MARCH 11, 1997

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Robert Gramm, NRR 415-1010
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GRADED QUALITY ASSURANCE (GQA)

- **BACKGROUND OF GQA - SECY 95-059**

  - Process to identify SSC safety significance

  - Application of QA controls based on safety function and significance

  - Effective root cause and corrective action program

  - Operational feedback to assess QA controls and safety significance

- **DEVELOPMENT OF REGULATORY GUIDE**

ELEMENT 1: DEFINE THE QA CHANGES

- **IDENTIFY REGULATORY COMMITMENTS**
- **IDENTIFY CANDIDATE SSCs FOR GRADED QA**
- **IDENTIFY EXPECTED REVISIONS TO QA PROGRAM**
- **EVALUATE RISK STUDY APPLICABILITY**

ELEMENT 2: ENGINEERING EVALUATION
CATEGORIZE SSC SAFETY SIGNIFICANCE

- **IDENTIFY SYSTEM FUNCTIONS**
  - Define all operating and accident functions performed by systems
- **CATEGORIZE SAFETY SIGNIFICANCE OF SYSTEM FUNCTIONS**
  - Safety significance classification, guided by PRA importance measures
  - Safety significance classification, guided by qualitative considerations
- **IDENTIFY SSCs THAT SUPPORT HIGH-SAFETY-SIGNIFICANT FUNCTIONS**
  - Complete list of all system components whose successful operation (passive and/or active) is needed for performance of system level function
- **CATEGORIZE SAFETY-SIGNIFICANCE OF SSCs**
  - Guiding principle: SSC operating modes (open, remain open, etc) required to support high-safety-significant system functions are also high-safety-significant

ELEMENT 2: ENGINEERING EVALUATION
CONFORMANCE WITH SAFETY PRINCIPLES

- **DEFENSE-IN-DEPTH IS MAINTAINED**
- **SAFETY MARGINS ARE MAINTAINED**
- **INDIVIDUAL PLANT RISK DOES NOT EXCEED CHANGE GUIDELINES**
- **ONLY SMALL INCREASES IN PLANT RISK**
- **INTEGRATED ASSESSMENT**

ELEMENT 3: DEVELOP IMPLEMENTATION AND MONITORING STRATEGIES

- **GRADING OF QA ACTIVITIES**

- **OPERATIONAL FEEDBACK**

  - **Operating Experience**
  - **Plant Modifications**
  - **Component Failure Monitoring**
  - **PRA Updates Based on New Information**

- **CORRECTIVE ACTIONS**

ELEMENT 4: DOCUMENTATION

- **SCOPE OF SYSTEMS FOR GQA**
- **FINAL CHARACTERIZATION OF SSC SAFETY SIGNIFICANCE**
- **PLANT OPERATING EXPERIENCE**
- **ENGINEERING EVALUATION**
- **DEVELOPMENT OF GQA PROGRAM**

RECENT REVISIONS TO GUIDE

- **BASED ON INTER-OFFICE REVIEW**
- **AMPLIFIED NEED FOR REGULATORY QA CONTROLS FOR NSR EQUIPMENT FOUND SAFETY SIGNIFICANT**
- **APPLICATION OF QA CONTROLS TO MONITORING PROCESS**
- **INCLUSION OF ADDITIONAL MATERIAL IN QA PROGRAM**
  - **Assumptions on SSC functional performance capabilities which support GQA change**
  - **Programmatic activities associated with GQA process and performance monitoring aspects**
- **REVISIONS NECESSARY TO ADDRESS ACRS CONCERNS**
  - **Approach is too burdensome**
  - **Need to adopt risk-informed process more fully**
  - **Guidance is too timid**

VOLUNTEER ACTIVITY

- **STAFF INTERACTIONS WITH 3 VOLUNTEER PLANTS**

  - **Palo Verde**
  - **South Texas**
  - **Grand Gulf**

- **SPECTRUM OF INTERACTIONS**

  - **Meetings**
  - **Site Visits**
  - **Review Of QA Program Change**
  - **Observation Of Expert Panels**
  - **Review Of Implementing Practices And Procedures**
  - **Review Of PRA**

- **INTERACTIONS WITH NEI**

PALO VERDE QA ASPECTS

- **LICENSEE CURRENTLY PURSUING APPLICATION OF GRADED PROCUREMENT CONTROLS**

- **STAFF VISITS TO SITE ON SEVERAL OCCASIONS**

  - **Expanded Application of Commercial Grade Item Dedication**
    - **Vacuum relief valve, HVAC damper blade seal, radiation detector circuit board, capacitors**

- **REQUEST FOR QA INFORMATION ISSUED 12/4/95**
  - **Procedural guidance**
  - **Feedback Loop**
  - **Confirmation Of Manufacturing Practices**
  - **Verification Of Critical Characteristics**

- **LICENSEE RESPONSE ON 9/12/96**
  - **Modified Procurement Practices**

SOUTH TEXAS QA ASPECTS

- **LICENSEE SUBMITTED QA PROGRAM CHANGE ON 3/28/96**

  - Proposed 3 Tier Implementation Of Quality Program: Full, Targeted, Basic
  - Proposed QA Controls For Safety-Related SSCs To Meet Appendix B In Alternate Manner

- **STAFF REQUEST FOR INFORMATION ISSUED ON 8/16/96**

- **STAFF OBSERVED CONDUCT OF WORKING GROUP AND EXPERT PANEL MEETINGS ON-SITE**

- **LICENSEE RE-SUBMITTAL OF QAP RECEIVED 1/97**

  - Staff Review Underway

GRAND GULF QA ASPECTS

- **LICENSEE QA CHANGE SUBMITTED ON 4/5/95**
- **LICENSEE ISSUED SAFETY-SIGNIFICANCE DETERMINATION PROCESS DESCRIPTION ON 10/11/95**
- **STAFF ISSUED CONCERNS ON QA COMMITMENT CONTROL ON 5/29/96**
- **STAFF CAUTIONED LICENSEE ON SCOPE OF CHANGES CONTEMPLATED UNDER 50.59**
- **SITE VISIT ON 11/21/96**

- Reviewed Implementation Procedures And Reviewed Procurement Activities For Sample Components
- Examined Controls Imposed on NSR High-Safety Significant Items
- Service Water Valve, Fire Pump Diesel Throttle Cable

CURRENT STAFF UNDERSTANDING OF VOLUNTEER PLANT
SAFETY SIGNIFICANCE CATEGORIZATION

IDENTIFY SYSTEM FUNCTIONS

STP Defines and categorizes every system function (critical/non-critical)

GG Categorizes systems, does not appear to define system function.

PV Categorizes systems, does not appear to define system function

CATEGORIZE SAFETY SIGNIFICANCE OF SYSTEM FUNCTIONS

- guided by PRA importance measures

STP **Emphasizes basic event importance for quantified items supported by linked level 2, external events PRA, and a variety of sensitivity studies**

GG **Surrogate basic event categorization, eg highest system basic event category determines system category**

PV **Apparently surrogate basic event categorization, eg highest system basic event category determines system category**

CATEGORIZE SAFETY SIGNIFICANCE OF SYSTEM FUNCTIONS

- guided by qualitative considerations (eg no importance measures)

STP All system functions are assigned as critical or non-critical
* assignment considered during component categorization

GG System level deterministic review to find systems
* used in non-quantified risk study (IPEEE, shutdown)
* used for containment integrity and LERF
* to check minimum success path requirements are met
* excluded from PRA due to inherent reliability
* required to support operator actions

PV Insufficient Information

IDENTIFY SSCs THAT SUPPORT HIGH-SAFETY-SIGNIFICANT FUNCTIONS

STP **Comprehensive cross-reference between system and component functions**

GG **Initially, all components in high-safety-significant system are high**

PV **Insufficient information**

CURRENT STAFF UNDERSTANDING OF VOLUNTEER PLANT
SAFETY SIGNIFICANCE CATEGORIZATION

CATEGORIZE SSCs' SAFETY-SIGNIFICANCE

STP **PRA Modelled SSCs**
* determined by individual SSC importance measures

SSCs not modelled in PRA
* Working group assignment of grading factors to Maintenance Rule deterministic factors
* final judgement made with consideration of SSC's total "score" and deterministic factors

GG **Move SSCs in high-safety significant system to low if,**
* not modelled in the PRA,
* not needed to support High PRA SSC,
* not needed to perform a risk significant (shutdown, IPEEE) function, and
* not needed to support "High" PRA Operator action.

PV **Insufficient Information**

CURRENT STAFF UNDERSTANDING OF VOLUNTEER PLANT
SAFETY SIGNIFICANCE CATEGORIZATION

DEFENSE IN DEPTH / SAFETY MARGIN CONSIDERATIONS

Initial response of pilots is that aggregate CDF and LERF sensitivity calculations are not useful, unanticipated and unacceptable trends will be picked up by periodic plant specific reliability data up-dates.

Grand Gulf

- * **minimum success path requirement for critical safety functions.**
- * **fission product barriers explicitly placed in High**

Palo Verde

- * **exclusions from grading EQ and ASME SSCs**
- * **CCF protection by not categorizing nominally identical items both high/low**

South Texas

- * **Only QA programmatic changes**
- * **Programmatic activities of high-safety-significant SSCs are not decreased**