

Presentation of the Changes in NUREG/BR-0058, Revision 5

Public Meeting
May 22, 2017

Purpose

Present changes to inform the public's comments on the draft NUREG/BR-0058, Revision 5, "Regulatory Analysis Guidelines of the U.S. NRC"

Agenda

- Introduction and opening remarks
- Background
- Changes from current document and other recent changes
- Overview of the NUREG
- Discussion of appendices
 - Qualitative Factors Assessment Tools
 - Cost Estimating and Best Practices
 - Treatment of Uncertainty
 - Regulatory Analysis Related to American Society of Mechanical Engineers (ASME) Code Changes
 - Special Circumstances and Relationship to Other Procedural Requirements
- Closing remarks

Announcements

- Category 3 Public Meeting
- Teleconference Number
 - 1-888-593-7858 passcode: 28650
- Webinar
 - <https://attendee.gotowebinar.com/register/1255996703947639041>
- If you are participating via the telephone, please send an email to Pamela.Noto@nrc.gov confirming your attendance

Background

- Fukushima Dai-ichi accident initiated questions regarding how NRC considers potential economic consequences (EC) of a nuclear accident
- SECY-12-0110, “Consideration of EC within the U.S. NRC’s Regulatory Framework”
- Staff Requirements Memorandum (SRM)-SECY-12-0110
 - SECY-14-0002, “Plan for Updating NRC’s Cost-Benefit Guidance”
 - SECY-14-0143, “Regulatory Gap Analysis of the NRC’s Cost-Benefit Guidance and Practices”

Background (cont'd)

- SRM-SECY-12-0157, “Consideration of Additional Requirements for Containment Venting Systems for Boiling Water Reactors with Mark I and Mark II Containments”
 - SECY-14-0087, “Qualitative Consideration of Factors in the Development of Regulatory Analyses and Backfit Analyses”
- Government Accountability Office (GAO) Audit Report Findings
- Office of Inspector General (OIG) Audit Report Findings

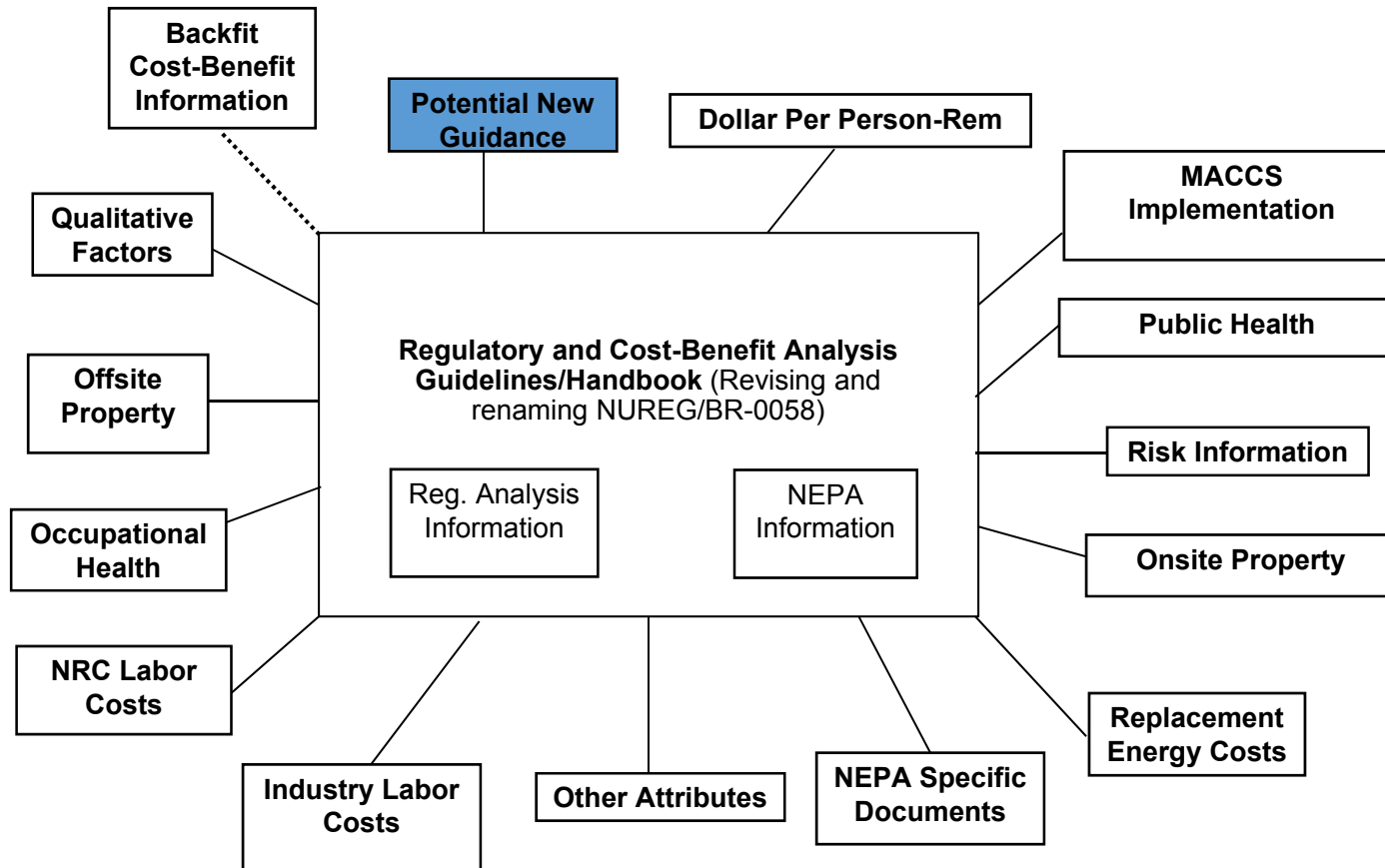
Changes

- Refocuses and expands guidance on cost-benefit analysis across the agency.
- Focuses on quantification and methods for creating realistic estimates.
- Provides methods for assessing factors that are difficult to quantify.
- Incorporation of cost estimating best practices.
- Expands on the treatment of uncertainties.
- Enhances transparency of analysis for the decisionmaker.

Changes (cont'd)

- Maintain and updating backfitting guidance in a separate document, NUREG-1409, “Backfitting Guidelines”
- Reflects revisions made to NUREG-1530, Revision 1, “Reassessment of the NRC’s Dollar per Person-Rem Conversion Factor Policy”
- NUREG/BR-0184 will be retired and incorporated into NUREG/BR-0058, Revision 5 and appendices

Mapping of Cost-Benefit Guidance Structure



NUREG Overview

- Regulatory Analysis
- Backfitting and Issue Finality
- National Environmental Policy Act (NEPA)
- Qualitative Factors Assessment Tools
- Cost Estimating and Best Practices
- Treatment of Uncertainty
- Regulatory Analyses Related to American Society of Mechanical Engineers (ASME) Code Changes
- Special Circumstances and Relationship to Other Procedural Requirements
- Future Appendices

Appendices Overview

Current Appendices

- Qualitative Factors Assessment Tools
- Cost Estimating and Best Practices
- Treatment of Uncertainty
- Guidance on Regulatory Analyses Related to ASME Code Changes
- Special Circumstances and Relationship to Other Procedural Requirements

Future Appendices

- Data Sources
- Historical Data
- Severe Accident Consequence Analysis
- NEPA Cost-Benefit Analysis
- Backfitting Cost-Benefit Analysis Procedures
- Morbidity
- Replacement Power Costs

Regulatory Analysis

- A formal, highly-structured, reasoned analysis of a proposed government agency requirement containing estimates of costs and benefits that are quantified to the fullest extent possible
- Includes societal cost-benefit analysis
- An analytical tool provided to decisionmakers
 - Rationale for action
 - Enhances transparency of analyses
 - Consistency with Executive Orders on regulatory analysis and related issues
 - Compliance with Office of Management and Budget guidance and Executive Orders

When are Regulatory Analyses Performed?

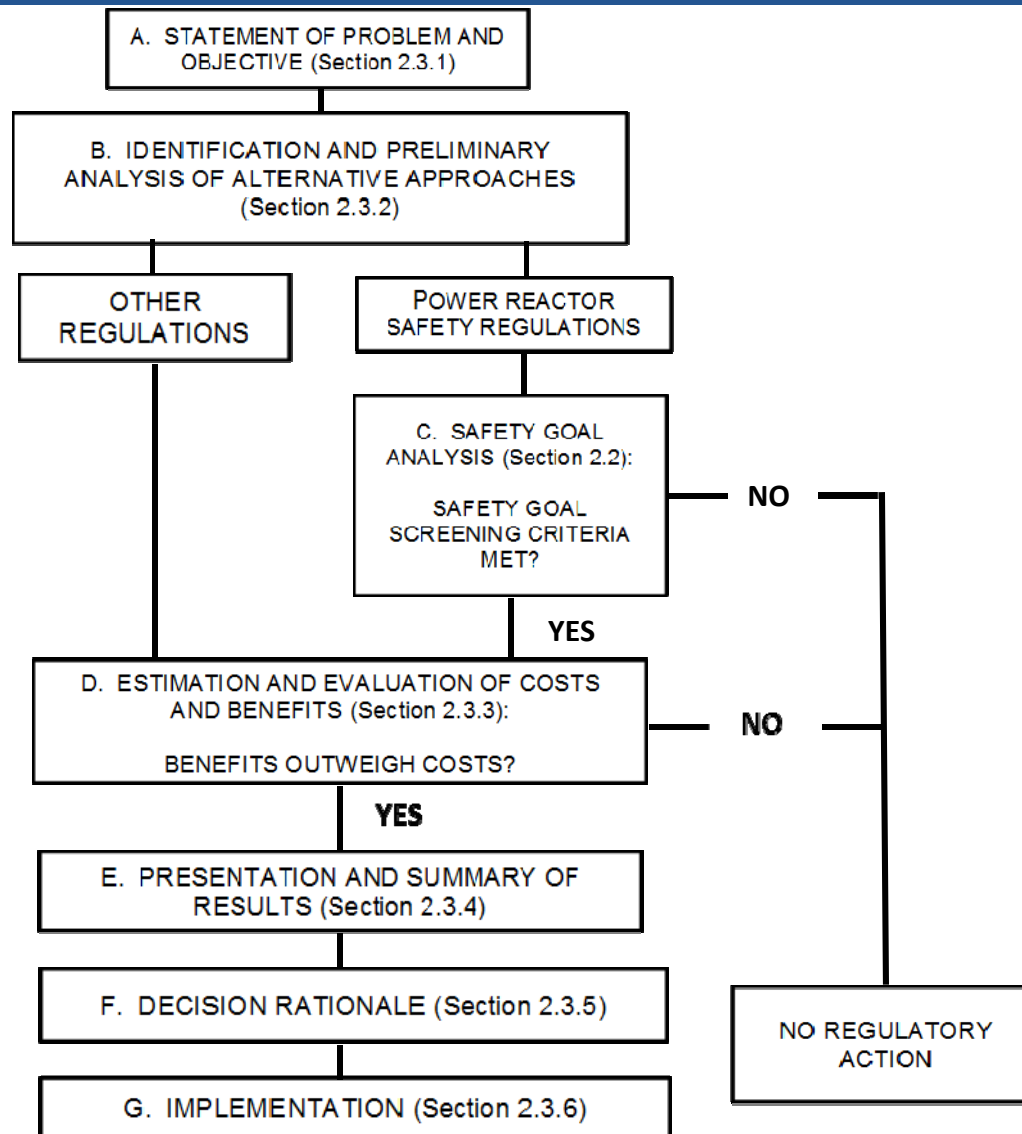
Regulatory analyses are performed for:

- Rules
- Cost-Benefit Guides
- Generic Communications
- Orders
- Standard Review Plans
- Enforcement Guidance Memoranda
- Interim Staff Guidance Documents
- NUREG Publications
- Standard Technical Specifications
- Branch Technical Positions

Regulatory analyses are not performed for:

- Licensing Actions
- Topical Reports
- Regulatory Issue Summaries
- Notices
- Policy Statements
- Inspection Reports
- Generic Letters
(transmittal of information)

Steps for Conducting a Regulatory Analysis



Attributes Considered in Regulatory and Cost-Benefit Analyses

- Public Health (Accident)
- Public Health (Routine)
- Occupational Health (Accident)
- Occupational Health (Routine)
- Offsite Property
- Onsite Property
- Industry Implementation
- Industry Operation
- NRC Implementation
- NRC Operation
- Other Government
- General Population
- Improvements in Knowledge
- Regulatory Efficiency
- Safeguards and Security Considerations
- Environmental Considerations
- Other Considerations

Estimation of Costs and Benefits

To the extent applicable, attributes to be assessed include the following:

Cost estimates:

- costs to licensees
- costs to the NRC
- costs to State, local, or tribal governments
- adverse effects on health, safety, or the natural environment
- adverse effects on regulatory efficiency or scientific knowledge needed for regulatory purposes
- adverse effects on the efficient functioning of the economy and private markets

Benefit estimates:

- reductions in public and occupational radiation exposure
- enhancements to health, safety, or the natural environment
- averted onsite impacts
- averted offsite property damage
- savings to licensees
- savings to the NRC
- savings to State, local, or tribal governments
- improved plant availability
- promotion of the efficient functioning of the economy
- reductions in safeguards risks

Safety Goal Screening Criteria

| | | | |
|--|--------------------|---|---|
| Change in Core Damage Frequency (Δ CDF)/RY | 1×10^{-3} | Proceed To Cost-Benefit Portion of Regulatory Analysis | Proceed to Cost-Benefit Portion of Regulatory Analysis* (Priority) |
| | 1×10^{-4} | Management Decision Whether to Proceed with Cost-Benefit Portion of Regulatory Analysis | Proceed to Cost-Benefit Portion of Regulatory Analysis |
| | 1×10^{-5} | No Action Taken** | Management Decision Whether to Proceed with Cost-Benefit Portion of Regulatory Analysis |
| | 1×10^{-6} | | |
| | | 1×10^{-2} | 1×10^{-1} |
| | | Estimated Conditional Containment Failure Probability*** | |

- * A determination is needed regarding adequate protection or compliance. The extent to which costs are considered is discussed in NUREG-1409.
- ** Unless an office director decides that the screening criteria do not apply (see Additional Consideration of Containment Performance)
- *** Conditional upon core damage accident that releases radionuclides into the containment (see Additional Consideration of Containment Performance)

Backfitting and Issue Finality

Regulatory analysis

- Required for all regulatory actions that involve backfitting licensed facilities and all regulatory actions that impose generic requirements
- Should account for the costs and averted costs discussed in NUREG-1409, “Backfitting Guidelines”

National Environmental Policy Act (NEPA)

- Cost-benefit analysis in 10 CFR Part 51
- Environmental Justice
- Public and occupational health impact analysis

Discussion of Appendices

Appendix A: Qualitative Factors Assessment Tools

- Establishes a structured process for when quantification is not practicable
- Provides guidance and best practices for use in evaluating qualitative factors
- Provides a number of standard methods
- Increases transparency and consistency

Appendix A: Qualitative Factors Assessment Tools (cont'd)

Toolkit Methods

- Qualitative Narrative
- Cost Effectiveness Analysis
- Threshold Analysis
- Bounding Analysis
- Rank-order/weight based analysis
- Maximin and Maximax Analysis
- Conjunctive and Disjunctive Analysis
- Lexicographic Analysis
- Decision Matrix
- Outranking Methods Technique

Appendix B: Cost Estimating and Best Practices

- Incorporated best practices
- Characteristics of a high quality cost estimate
 - Credible
 - Well-documented
 - Accurate
 - Comprehensive

Appendix B: Cost Estimating and Best Practices (cont'd)

Improvements in cost estimating practices

- Expand guidance to incorporate cost estimating best practices
- Describe methods and procedures recommended for use in preparing cost estimates that are specific to all work
- Describe practices relative to estimating life cycle costs

Development Process

- Planning
- Inputs
- Preparation
- Review
- Reconciliation
- Documentation

Appendix C: Treatment of Cost Estimate Uncertainty

- Past NRC Regulatory Analysis
 - Point estimates
 - Sensitivity analysis on a case-by-case basis
 - Infrequent use of uncertainty analysis
- Current Regulatory Analysis
 - Parametric estimates
 - Sensitivity and uncertainty analyses performed
 - Revised guidance reflects this new approach

Appendix D: Regulatory Analyses Related to ASME Code Changes

- Consensus Standards
 - May involve hundreds or thousands of individual provisions already agreed upon by industry
 - Participants have broad and varied interests
 - Consistent with the National Technology Transfer and Advancement Act
- No Proposed Change to Current Cost-Benefit Analysis Guidance

Appendix E: Special Circumstances

- Safety goal screening
- Sunk costs
- Treatment of industry initiatives
- Criteria for the treatment of individual requirements
- Intergenerational cost-benefit assessments
- Procedural requirements

Future Appendices

- Data Sources
- Historical Data
- Severe Accident Consequence Analysis
- NEPA Cost-Benefit Analysis
- Backfitting Cost-Benefit Analysis Procedures
- Morbidity
- Replacement Power Costs

Revision Plan for NUREG

- Main body of NUREG and appendices will be controlled separately
 - Main body is Revision 5
 - New appendices begin at Revision 0
- Index will be updated for each change

| | | <u>Issued</u> <u>Year/Month</u> |
|--|-----|------------------------------------|
| NUREG/BR-0058, Regulatory Analysis Guideline of the U.S. NRC | ... | 83/1 |
| | 1 | 84/5 |
| | 2 | 95/11 |
| | 3 | 00/7 |
| | 4 | 04/9 |
| | 5 | 17/ |
| Appendix A, Qualitative Factors Assessment Tools | ... | 17/ |
| Appendix B, Cost Estimating and Best Practices | ... | 17/ |
| Appendix C, The Treatment of Uncertainty | ... | 17/ |
| Appendix D, Guidance on Regulatory Analysis Related to ASME Code Changes | ... | 04/9 |
| | 1 | 17/ |
| Appendix E, Special Circumstances | ... | 17/ |
| Appendix F, Data Sources | ... | 17/ |
| Appendix G, Historical Data | ... | 17/ |
| Appendix H, Severe Accident Consequence Analysis | ... | 17/ |
| Appendix I, NEPA Cost-Benefit Analysis | ... | 17/ |
| Appendix J, Backfitting Cost-Benefit Analysis Procedures | ... | 17/ |
| Appendix K, Morbidity | ... | 17/ |
| Appendix L, Replacement Power Costs | ... | 17/ |

Document Collection Location for NUREG

- <https://www.nrc.gov/reading-rm/doc-collections/nuregs/pubs/2017/>
- <https://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0058/>

Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission, Draft Report for Comment (NUREG/BR-0058, Rev. 5)

This NUREG/BR publication has been issued for public comment. Comments will be accepted until June 16, 2017. To submit comments, please see [Docket ID NRC-2017-0091](#) **EXIT**.

On this page:

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- [Abstract](#)

Download complete document

- [NUREG/BR-0058, Revision 5 \(PDF - 496 KB\)](#) 
 - [Appendix A](#) 
 - [Appendix B](#) 
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 - [Appendix G](#) 
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 - [Appendix I](#) 
 - [Appendix J](#) 
 - [Appendix K](#) 
 - [Appendix L](#) 

Publication Information

Manuscript Completed: April 2017

Date Published: April 2017

How to Provide Comments

- Federal Rulemaking Web Site
 - ✓ <http://www.regulations.gov>
 - ✓ Docket ID NRC-2017-0091
 - ✓ Docket questions: Carol Gallagher, 301-415-3463, Carol.Gallagher@nrc.gov
 - ✓ Technical questions: Pamela Noto, 301-415-6795, pamela.noto@nrc.gov
- Mail comments
 - ✓ Cindy Bladey, Office of Administration
Mail Stop:OWFN-12-H08
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Backup Slides

Draft Outline

1. Introduction
2. Data Types and Collection
3. Data Sources
4. Routine Data Normalization Adjustments
5. Significant Data Normalization Adjustments
6. References

Appendix G: Historical Data

Draft Outline

1. Introduction
2. Occupational Health (Accident)
 - a. Estimation of Accident-Related Exposures
 - b. Monetary Valuation of Accident-Related Exposures
 - c. Discounting Monetized Values of Accident-Related Exposures
3. Occupational Health (Routine)
 - a. Approximation Method to Estimate the Change in Routine Exposure
4. Offsite Property
5. Onsite Property
 - a. Cleanup and Decontamination
 - b. Long-Term Replacement Power
 - c. Repair and Refurbishment
 - d. Total Onsite Property Damage Costs
6. Industry Implementation
 - a. Short-Term Replacement Power
7. References

Appendix H: Severe Accident Consequence Analysis

Draft Outline

1. Introduction
 - a. Background
 - b. Purpose of document
2. Description of tools and capabilities
 - a. PRA information
 - b. MELCOR
 - c. MACCS
3. Severe reactor accident offsite consequence analysis
 - a. Scope based on regulatory problem statement
 - i. Scenario development
 - ii. Affected population of plants and affected parameters
 - b. PRA information and frequency weighting
 - c. Accident progression analysis
 - i. Sources of information
 - ii. MELCOR modeling approach
 - d. Off-site consequence analysis
 - i. Sources of information
 - ii. MACCS modeling approach
4. Supplemental analyses
 - a. Sensitivity analyses
 - b. Uncertainty analyses
 - c. Plant-to-plant variability analyses
5. Presentation of results - inputs to regulatory analysis
 - a. Early fatality risk
 - b. Latent cancer fatality risk
 - c. Population dose risk
 - d. Offsite economic cost risk
 - e. Key assumptions and uncertainties
6. References

Appendix I: NEPA Cost-Benefit Analysis Guidance

Draft Outline

1. Purpose
2. Cost-Benefit Analysis for National Environmental Policy Act (NEPA) Reviews
 - a. Regulatory Requirements
 - b. NRC Guidance
3. Environmental Justice
 - a. Commission's Policy Statement
 - b. NRC Guidance
4. Severe Accident Mitigation Alternatives (SAMA)
 - a. Analysis Methodology
 - b. Specific Considerations for Severe Accident Mitigation Design Alternatives (SAMDA)
 - c. Material Licenses
5. References

Appendix J: Backfitting Cost-Benefit Analysis Procedures

Draft Outline

1. Introduction
2. Discussion
 - a. Backfit Determination
 - b. Justification for Imposing Backfits
 - i. Basic Backfit Justification (Backfit Rule)
 - ii. Regulatory Analysis (Staff Procedures)
 - iii. Further Justification (Staff Procedures)
 - c. Staff Process for Identifying and Imposing Generic Backfits
3. Questions and Answers on Backfitting
 - a. Backfit Determination and Imposition
 - b. Generic Backfits
 - c. Facility-Specific Backfits
 - d. Backfit Analysis
 - e. Appeals
 - f. General Questions
4. References

Appendix K: Morbidity

Draft Outline

1. Introduction
2. Discussion
 - a. Morbidity and Heritable Effects
 - b. Morbidity and the Cancer Risk Coefficient
3. Methods to Estimate Morbidity Health Effects
 - a. Willingness To Pay
 - b. Risk-Risk Tradeoffs
 - c. Health-State Indices
 - d. Quality-Adjusted Life-Year
4. References

Appendix L: Replacement Power Costs

Draft Outline

1. Introduction
2. Fuel and Cost Outlooks and Modeling Parameters
 - a. Modeling Overview
 - b. Comparison of Fuel Price Outlooks
3. Market Areas and Units for Analysis
 - a. Analysis Overview
 - b. Market Areas
 - c. Selection of Most and Least Critical Units by Market Area
4. Analysis of Unit Outage Impacts: Wholesale Prices and the Replacement Cost of Power
 - a. Summary of Impacts and Guidance on How to Use Report
 - b. Impact of a Nuclear Outage in the NYISO and ISO-NE Markets
 - c. Impact of a Nuclear Outage in the PJM Markets
 - d. Impact of a Nuclear Outage in the MISO Market
 - e. Impact of a Nuclear Outage in the SPP Market
 - f. Impact of a Nuclear Outage in the Southern Markets
 - g. Impact of a Nuclear Outage in the ERCOT Market
 - h. Impact of a Nuclear Outage in the WECC Interconnection Markets
5. References
6. Enclosure 1: Data
7. Enclosure 2: Detailed Assumptions for HIS Environmental Policies
8. Enclosure 3: Glossary

References

- GAO Audit Report, GAO-15-098
- GAO Cost Estimating and Assessment Guide, GAO-09-3SP
- ICRP 60, 1991
- ICRP 103, 2007
- NUREG/BR-0058, Rev. 4 available at ML042820192
- NUREG/BR-0058, Rev. 5 available at ML17023A180
- NUREG/BR-0184 available at ML050190193
- NUREG-1409 available at ML032230247
- NUREG-1530 available at ML063470485
- NUREG-1530, Rev. 1 available at ML17018A239
- OIG Report OIG-15-A-15, Audit of NRC's Regulatory Analysis Process available at ML15175A344

References (cont'd)

- SECYs
 - available at <http://www.nrc.gov/reading-rm/doc-collections/commission/> or in ADAMS
 - SECY-12-0110 available at ML12173A478
 - SECY-14-0002 available at ML13274A519
 - SECY-14-0087 available at ML14127A458
 - SECY-14-0143 available at ML14280A426
 - SRM-SECY-12-0110 available at ML13079A055
 - SRM-SECY-12-0157 available at ML13078A017
 - SRM-SECY-14-0087 available at ML15063A568