

NUREG-0956
REASSESSMENT OF THE TECHNICAL BASES
FOR ESTIMATING SOURCE TERMSExecutive SummaryCHAPTER1. REGULATING SEVERE ACCIDENTS^A2. HISTORICAL PERSPECTIVE

- 2.1 Maximum Credible Accident
- 2.2 Design Basis Accident
- 2.3 Reactor Safety Study
- 2.4 Review of Source Term Assumptions
- 2.5 Generic Siting Study
- 2.6 Current Source Term Analyses
- 2.7 Ongoing Validation Programs

3. CURRENT ANALYTICAL METHODS

3.1 Thermal and Hydraulic Behavior of the Reactor

- 3.1.1 Overall Assessment of Reactor Coolant System and Containment (MARCH)
- 3.1.2 Detailed Flow Rates in the Reactor Coolant System (MERGE)
- 3.1.3 Detailed Core-Concrete Interactions in the Containment (CORCON)

- 3.2 Fission Product Generation in the Fuel (ORIGEN)
- 3.3 Fission Product Release from the Fuel (CORSOR)
- 3.4 Fission Product Retention in the Reactor Coolant System (TRAP-MELT)
- 3.5 Fission Product Release from the Core-Concrete Melt (VANESA)
- 3.6 Fission Product Retention in the Containment

- 3.6.1 Natural Deposition of Aerosols (NAUA)
- 3.6.2 Retention in Water Pools (SPARC)
- 3.6.3 Retention in Ice Condensers (ICEDF)

- 3.7 Code Validation Review
- 3.8 Uncertainty Study (QUEST)
- 3.9 Summary Evaluation of Current Analytical Methods

- 3.9.1 Areas of Major Uncertainty
- 3.9.2 Fission Product Chemistry
- 3.9.3 Summary

4. RESULTS FOR SELECTED ACCIDENT SEQUENCES

- 4.1 Summary Description of Accident Sequences Analyzed
- 4.2 Fission Product Inventory
- 4.3 Fuel Temperatures
- 4.4 Fission Product Release From Fuel
- 4.5 Upper Plenum Temperatures
- 4.6 Retention in the Reactor Coolant System
- 4.7 Fission Product Release from the Molten Core
- 4.8 Containment Leakage and Failure
- 4.9 Aerosol Retention in Containment
- 4.10 Summary of Sample Source Term Calculations

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5. REVIEW OF SOURCE TERM WORK

5.1 Peer Review of NRC-Sponsored Source Term Work

- 5.1.1 Technical Expert Peer Review
- 5.1.2 American Physical Society Study Group

5.2 Discussion of Other Source Term Work

- 5.2.1 American Nuclear Society Study Report
- 5.2.2 Industry Degraded Core Rulemaking Program

6. PROBABILITY AND CONSEQUENCES OF SELECTED ACCIDENT SEQUENCES

- 6.1 Core Melt Probabilities for Selected Sequences
- 6.2 Containment Failure Mode Analysis
- 6.3 Containment Event Trees
- 6.4 Offsite Consequences

7. CONCLUSIONS AND RECOMMENDATIONS

- 7.1 Methodology
- 7.2 Selected Calculations
- 7.3 Applicability to Regulatory Process
- 7.4 Additional Observations and Recommendations

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A. BASIC REACTOR SYSTEMS AND CONTAINMENTS

B. PROBABILITY ESTIMATES

- B.1 Accident Sequence Likelihood
- B.2 Containment Event Analysis and Estimation of Source Term Frequencies

C. CONTAINMENT ANALYSIS

- C.1 Summary of Containment Loads Working Group
- C.2 Summary of Containment Performance Working Group