

April 15, 1982

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION  
ATOMIC SAFETY AND LICENSING BOARD

Before Administrative Judges:  
Marshall E. Miller, Chairman  
Gustave A. Linenberger, Jr.  
Dr. Cadet H. Hand, Jr.



In the Matter of

UNITED STATES DEPARTMENT OF ENERGY  
PROJECT MANAGEMENT CORPORATION  
TENNESSEE VALLEY AUTHORITY

(Clinch River Breeder Reactor Plant)

Docket No. 50-537

NATURAL RESOURCES DEFENSE COUNCIL, INC.  
AND THE SIERRA CLUB  
SIXTH REQUEST TO APPLICANTS FOR  
PRODUCTION OF DOCUMENTS

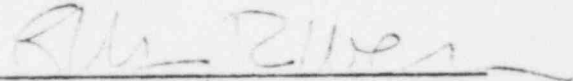
Pursuant to 10 CFR § 2.741, and in accordance with the Board's Prehearing Conference Order of February 11, 1982. Intervenor, Natural Resources Defense Council, Inc., and the Sierra Club, request that Applicants provide Intervenor with copies of the following documents. "Documents" are defined in the same manner as in Intervenor's Twenty-Fourth Set of Interrogatories and Request To Produce to Staff.

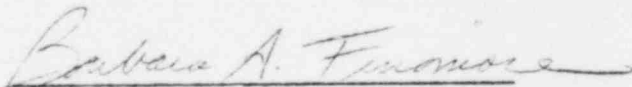
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I. Contentions 1, 2, and 3

1. Please provide copies of all the documents whose reference number is circled in the attached list of references for General Electric, An Assessment of HCDA Energetics in the CRBRP Heterogeneous Reactor Core (CRBRP-GEFR-00523, December 1981). (See Attachment 1.) With regard to references to Transactions of the ANS meeting, provide the complete paper (including figures) where these are available to Applicants, not just the abstract.
2. Provide all documents in the possession of Applicants whose reference number is circled in the following list of references to Section V of the U.S. Department of Energy's Draft Environmental Impact Statement on the Liquid Metal Fast Breeder Reactor Program (Supplement to ERDA-1535) (Dec. 1981). (See Attachment 2.)

Respectfully submitted,

  
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Dated: April 15, 1982  
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11. REFERENCES

1. CRBRP Preliminary Safety Analysis Report, Project Management Corporation, Docket No. 50-537.
2. "Hypothetical Core Disruptive Accident Considerations in CRBRP; Energetics and Structural Margin Beyond the Design Base," CRBRP-3, Vol. 1.
3. J. L. McElroy, et al., "An Analysis of Hypothetical Core Disruptive Events in the Clinch River Breeder Reactor Plant," CRBRP-GEFR-00103, General Electric Co., April 1978.
4. W. R. Bohl, et al., "An Analysis of the Unprotected Loss-of-Flow Accident in the Clinch River Breeder Reactor with an End-of-Equilibrium-Cycle Core," ANL/RAS 77-15, May 1977.
5. J. F. Jackson and R. E. Nicholson, "VENUS-II: An LMFBF Disassembly Program," Argonne National Laboratory, ANL-7951, 1972.
6. F. E. Dunn, et al., "The SAS3A LMFBF Accident Analysis Computer Code," ANL/RAS 75-17, April 1975.
7. F. E. Dunn, et al., "The SAS2A LMFBF Accident Analysis Computer Code," ANL-8138, October 1974.
8. W. R. Bohl, "SLUMPY: The SAS3A Fuel Motion Model for Loss-of-Flow," ANL/RAS 74-18, August 1974.
9. L. L. Smith, et al., "SAS/FCI: The SAS3A Fuel-Coolant Interaction Model," ANL/RAS 75-33, Argonne National Laboratory, December 1975.
10. W. R. Bohl and T. J. Heames, "CLAZAS: The SAS3A Clad Motion Model," ANL/RAS 74-15, Aug. 1974.
11. D. S. Dutt, et al., "A Correlated Fission Gas Release Model for Fast Reactor Fuels," Trans. ANS 15, p. 198 (1972).

12. E. E. Gruber, "Calculation of Transient Fission Gas Release from Oxide Fuel," ANL-8143, November 1974.
13. E. E. Gruber, "Transient Gas Release from Oxide Fuels: Parametric Representations of FRAS Results," ANL/RAS 75-7, March 1975.
14. C. A. Hinman and O. D. Slagle, "Ex-Reactor Transient Fission Gas Release Studies, Fuel Pin PNL-2-4," HEDL-TME 77-83, May 1978.
15. E. E. Gruber, "FRAS Code Development," ANL-RDP-54, October 1976.
16. C. C. Meek, "FSTATE," ANL/RAS 77-49, November 1977.
17. R. W. Ostensen, "FISGAS - A Code for Fission-Gas Migration and Fuel Swelling Behavior in an LMFBR Accident," SAND 78-1790, Nov. 1979.
18. C. A. Hinman and E. H. Randklev, "Ex-Reactor Transient Fission Gas Release Studies, Fuel Pin PNL-10-50 and 55," HEDL-TME 79-52, Sept. 1980.
19. O. D. Slage, et al., "Experiments on Melting and Gas Release Behavior of Irradiated Fuel," HEDL-TME 74-17, 1975.
20. L. Leibowitz, et al., "Properties for LMFBR Safety Analysis," ANL-CEN-RSD-76-1, March 1976.
21. R. N. Koopman, et al., "Final Report for TREAT Transient Overpower Tests R9 and R12," ANL/RAS 80-11, Argonne National Laboratory, April 1980.
22. B. J. Wrona and T. M. Galvin, "Fuel Behavior Slightly Above or Below the Failure Threshold," Trans. ANS, 21, p. 306, 1975.
23. B. W. Spencer, et al., "Summary and Evaluation of R-Series Loss-of-Flow Safety Tests in TREAT," Int. Mtg. on Fast Reactor Safety and Related Physics, Chicago, Ill., October 1976.

24. H. Kwast, "Phenomena Observed During Failure of Fast Reactor Fuel Pins Tested under Loss-of-Cooling Conditions," Int. Mtg. on Fast Reactor Safety Technology, Seattle, WA, August 1979.
25. H. U. Wider, et al., "The PLUTO2 Overpower Excursion Code and a Comparison with EPIC," Int. Meeting on Fast Reactor Safety Technology, Seattle, WA, August 1979.
26. G. Bandyopadhyay and J. A. Buzzell, "Role of Fission Gas and Fuel Melting in Fuel Response During Simulated Hypothetical Loss-of-Flow Transients," Nuclear Technology, 47, January 1980.
27. G. L. Cano, et al., "Visual Investigation of Reactor Fuels Response to Simulated LOF Heating Conditions, First Series," SAND 79-0940, October 1979.
28. J. G. Eberhart, et al., "Final Report on Test L4, A Loss-of-Flow Experiment," ANL-76-130, December 1976.
29. C. E. Dickerman, et al., "Summary of TREAT Experiments on Oxide Core-Disruptive Accidents," ANL-79-13, February 1979.
30. R. G. Palm, et al., "F1 Phenomenological Test on Fuel Motion: Final Report," ANL-78-50, May 1978.
31. R. Simms, et al., "Loss-of-Flow Test L5 on FFTF-Type Irradiated Fuel," ANL-78-24, March 1978.
32. R. Simms, et al., "Interim Report for ANL/RAS Loss-of-Flow Test L6," ANL/RAS 79-20, August 1979.
33. R. Simms, et al., "TREAT Test L7 Simulating an LMFBR Loss-of-Flow Accident with FTR-Type Fuel," ANL/RAS 80-5, Argonne National Laboratory, June 1980.
34. R. Simms, "An Interpretation of Fuel Motion in Recent TREAT Experiments with LMFBR Fuel," ANL/RAS 79-18, July 1979.

35. C. H. Bowers, et al., "Analysis of TREAT Tests L7 and L8 with SAS3D, LEVITATE AND PLUTO2," International Meeting on Fast Reactor Safety Technology, Seattle, WA, August 1979.
36. G. Bandyopadhyay and J. A. Buzzell, "Cladding and Fuel Motion of Irradiated Stainless Steel-Clad Mixed Oxide Fuels in Response to Simulated Thermal Transients," Int. Meeting on Fast Reactor Safety Technology, Seattle, WA, August 1979.
37. R. W. Ostensen and M. F. Young, "Analysis of In-Pile Fuel Disruption Experiments," Trans. ANS, 28, p. 437 (1978).
38. R. W. Ostensen, "Comparison of FISGAS Swelling and Gas Release Predictions with Experiments," Specialist Workshop on Predictive Analysis of Material Dynamics in LMFBR Safety Experiments, Los Alamos, NM, March 1979.
39. D. H. Worledge and G. L. Cano, "Study of the Dispersive Potential of Irradiated Fuel Using In-Core Experiments," Int. Meeting on Fast Reactor Safety Technology, Seattle, WA, August 1979.
40. L. W. Deitrich and R. W. Ostensen, "Assessment of Fission-Gas-Driven Fuel Disruption and Dispersal in a Hypothetical LMFBR Loss-of-Flow Accident," ANL/RAS 77-4, February 1977.
41. "Nuclear Systems Materials Handbook," HEDL-TID-26666, Hanford Engineering Development Laboratory, as of January 1980.
42. B. W. Spencer, et al., "Results of Recent Upper Plenum Injection Tests," Proc. of the International Meeting on Fast Reactor Safety Technology, Seattle, WA, August 1979.
43. B. W. Spencer, et al., "CAMEL TOP/Fuel Sweepout Single-Pin Test C2," ANL/RAS 77-22, July 1977.
44. Reactor Development Program Progress Report, July 1979, ANL-RDP-85, p. 2.21.

45. U.S. Department of Energy Fast Reactor Safety Program Progress Report, October-December 1979, ANL/TMC 80-1, p. 60.
46. B. W. Spencer, et al., "Interim Report on TREAT Test R8, a Seven-Pin-Loss-of-Flow Test with Pressurized Pins," ANL/RAS 78-39, September 1978.
47. T. G. Theofanous, "Multiphase Transients with Coolant and Core Materials in LMFBR Core Disruptive Accident Energetics Evaluation," NUREG/CR-0224, Purdue University, July 1978.
48. W. R. Bohl, "Some Recriticality Studies with SIMMER-II," Proc. Int. Mtg. Fast Reactor Safety Technology, Seattle, WA, August 19-23, 1979.
49. T. E. Kraft, et al., "Simulations of an Unprotected Loss-of-Flow Accident with a 37-pin Bundle in the Sodium Loop Safety Facility," Proc. Intl. Mtg. on Fast Reactor Safety Technology, Seattle, WA, Aug. 19-23, 1979.
50. H. K. Fauske, "Some Comments on Cladding and Early Fuel Relocation in LMFBR Core Disruptive Accidents," Trans. Am. Nucl. Soc., Vol. 21, pp. 322-323, 1975.
51. R. E. Henry, et al., "Wood's Metal Cladding Relocation Experiments," ANL/RAS 77-37, 1977.
52. B. W. Spencer, et al., "Reactor-Material Fuel Freezing Experiments Using Small-Bundle, CRBR-Type Pins," ANL/RAS 79-11, Argonne National Laboratory, July 1979.
53. B. W. Spencer, et al., "Summary and Evaluation of Reactor-Material Fuel Freezing Tests," Proc. Intl. Mtg. on Fast Reactor Safety Technology, Seattle, WA, Aug. 19-23, 1979.
54. F. B. Cheung and L. Baker, Jr., "Transient Freezing of Liquids in Tube Flow," Nucl. Sci. and Eng., Vol. 60, No. 1, May 1976.



55. R. W. Ostensen, et al., "Fuel Flow and Freezing in the Upper Sub-assembly Structure Following an LMFBR Disassembly," Trans. Am. Nuc. Soc., Vol. 18, June 1974.
56. M. Epstein, et al., "Transient Freezing of a Flowing Ceramic Fuel in a Steel Channel," Nuc. Sci. Eng., Vol. 61, 1976.
57. S. W. Eisennawer, et al., "A Study of Heat Transfer from a Flowing Liquid to a Melting Wall," Proc. Intl. Mtg. on Fast Reactor Safety Technology, Seattle, WA, Aug. 19-23, 1979.
58. J. F. Jackson, et al., "Report on the Core Disruption Phase of an Unprotected Flow - Coastdown Accident in FTR," ANL/RAS 74-16, August 1974.
59. G. A. Greene, O. C. Jones, Jr., and N. Abauf, "Boundary Heat Transfer from Volumetrically Boiling Pools: Bubbly and Churn-Turbulent Flow Regimes," Trans. Am. Nuc. Soc., Vol. 33, 1-986, San Francisco, CA, Nov. 1979.
60. M. Epstein and G. M. Hauser, "The Melting of Finite Steel Slabs in Flowing Nuclear Reactor Fuel," Nucl. Eng. and Design, 52, pp. 411-428, 1979.
61. M. Epstein, "Heat Conduction in the  $UO_2$  Cladding Composite Body with Simultaneous Solidification and Melting," Nucl. Sci. Eng., Vol. 51, pp. 84-87, 1973.
62. M. Epstein, L. J. Stachyra and G. A. Lambert, "Transient Solidification in Flow into a Rod Bundle," J. Heat Transfer, Vol. 102, No. 2, May 1980.
63. G. Maurin and M. Amblard, "An Approach of Molten Fuel Relocation Problem: Fuel Freezing," ANS/ENS Int. Topical Mtg. on Nuclear Power Reactor Safety, Brussels, October 16-19, 1978.

64. R. W. Wright, et al., "Summary of Autoclave TREAT Tests on Molten Fuel-Coolant Interactions," Proc. Fast Reactor Safety Mtg., CONF-740401-P1, Beverly Hills, CA, p. 254, April 1974.
65. M. Epstein and D. H. Cho, "Fuel Vaporization and Quenching by Cold Sodium; Interpretation of TREAT Test S11," Proc. Fast Reactor Safety Mtg., CONF-740401-P2, Beverly Hills, CA, April 1974.
66. T. R. Schmidt, "LMFBR Prompt Burst Excursion (PBE) Experiments in the Annular Core Pulse Reactor (ACPR)," Proc. Int. Mtg. on Fast Reactor Safety and Related Physics, CONF-761001, Chicago, IL, October 5-8, 1976.
67. K. O. Reil and M. F. Young, "Prompt Burst Energetics on the Oxide/Sodium System," Proc. Int. Mtg. on Fast Reactor Safety Technology, Seattle, WA, August 19-23, 1979.
68. H. Jacobs, et al., "Fuel-Coolant Interaction Phenomena under Prompt Burst Conditions," Proc. Int. Mtg. on Fast Reactor Safety Technology, Seattle, WA, August 19-23, 1979.
69. A. Amblard and H. Jacobs, "Fuel-Coolant Interactions; the CORECT-II  $\text{UO}_2$ -Na Experiment," Proc. Int. Mtg. on Fast Reactor Safety Technology, Seattle, WA, August 19-23, 1979.
70. R. E. Henry, et al., "Experiments on Pressure-Driven Fuel Compaction with Reactor Materials," Proc. Int. Mtg. on Fast Reactor Safety and Related Physics, CONF-761001, Chicago, IL, October 5-8, 1976.
71. H. Fauske, R. Henry and M. Groimes, "An Assessment of Voiding Dynamics in Sodium-Cooled Fast Reactors," ANL/RAS 74-20, Argonne National Laboratory, August 1974.
72. M. A. Groimes and G. A. Lambert, "Liquid Film Considerations for LMFBR Accident Analysis," Proc. ANS/ENS Int. Conf., Washington, D.C., November 17-21, 1980.

73. S. J. Hakim and J. M. Kennedy, "Development of Transition Phase Code," ANL-RDP-70, p. 6.74, April 1978.
74. M. Ledinegg, "Instability of Flow During Natural and Forced Circulation," *Die Wärme*, 61(8) 91, 1938.
75. F. J. Martin, "Bottled Transition Phase Analysis-Preliminary Report," HEDL-TME 78-64, Hanford Engineering Development Laboratory, Richland, WA, April 1980.
76. H. K. Fauske, "Boiling Flow Regime Maps in LMFBR HCDA Analysis," *Trans. Am. Nuc. Soc.*, Vol. 22, 385-386 San Francisco, California, Nov. 1975.
77. T. Ginsberg, O. C. Jones, Jr., and J. C. Chen, "Volume-Heated Boiling Pool Flow Behavior and Application to Transition Phase Accident Conditions," BNL-NUREG-24984, Brookhaven National Laboratory, Upton, New York, Oct. 1978.
78. M. Farahat, R. E. Henry and J. Santori, "Fuel Dispersal Experiments with Simulant Fluids," *Proc. Int. Mtg. on Fast Reactor Safety and Related Physics*, USERDA Report CONF-761001, Vol. IV, pp. 1707-1714, 1976.
79. T. Ginsberg, O. C. Jones and J. C. Chen, "Flow Behavior of Volume-Heated Boiling Pools: Implications with Respect to Transition Phase Accident Conditions," *Nucl. Tech.*, Vol. 46, pp. 391-398, 1979.
80. K. W. Orth, et al., "Hydrodynamic Aspects of Volume Boiling," ANL/RAS 80-6, March 1980.
81. F. A. Koontz, "Volumetric Boiling - A Fundamental Study of the Phenomena Pertaining to LMFBR Safety," M.S. Thesis, Purdue University, August 1977; see also Reference 47.

82. W. R. Gustavson, J. C. Chen and M. S. Kazimi, "Heat Transfer and Fluid Dynamic Characteristics of Internally Heated Boiling Pools," BNL-NUREG-50722, Brookhaven National Laboratory, September 1977.
83. J. D. Gabor, et al., "Heat Transfer from Heat-Generating Boiling Pools," Nat. Heat Transfer Conf., St. Louis, MO, August 1976.
84. M. Epstein, "Transient Behavior of a Volume-Heated Boiling Pool," ASME Winter Meeting, Paper No. 75-WA/HT-31, Houston, TX, December 1975.
85. G. A. Green, O. C. Jones, and N. Abuat, "Comparison of Measured and Calculated Average Void Fraction in Volume-Boiling Pools with Inclined Boundaries," ANS Transactions 33, San Francisco, CA, Nov. 1979.
86. V. K. Dihl, et al., Proc. Int. Mtg. on Fast Reactor Safety and Related Physics, CONF-761001, Vol. 3, pp. 1172-1182, 1976.
87. R. W. Ostensen, Trans. Am. Nucl. Soc., Vol. 27, p. 662, 1977.
88. M. Epstein, "Stability of a Submerged Frozen Crust," J. of Heat Transfer, Vol. 99, pp. 527-537, 1977.
89. A. Yim, M. Epstein, S. G. Bankoff, G. A. Lambert and G. M. Hauser, "Freezing Melting Heat Transfer in a Tube Flow," Int. J. Heat Mass Transfer, Vol. 21, pp. 1185-1198, 1978.
90. M. J. Swedish, M. Epstein, J. H. Linehan, G. A. Lambert, G. M. Hauser and L. J. Stachyra, "Surface Ablation in the Impingement Region of a Liquid Jet," AIChE Journal, Vol. 25, pp. 630-638, 1979.
91. A. W. Cronenberg and H. K. Fauske, "UO<sub>2</sub> Solidification Phenomena Associated with Rapid Cooling in Liquid Sodium", J. Nucl. Materials, Vol. 52, pp. 24-32, 1974.
92. J. Frenkel, "Kinetic Theory of Liquids," Dover, Chapter VII, 1952.

93. K. Koide, et al., "Behavior of Bubbles in Large-Scale Bubble Column," J. of Chem. Eng. of Japan, Vol. 12, No. 2, April 1979.
94. T. Ginsberg, "Role of Condensation on Dispersion of Closed Boiling  $\text{UO}_2$  Systems," Am. Nuc. Soc. Trans., Vol. 26, pp. 363-364, June 1977.
95. H. Kato, N. Nishiwaki and M. Hirata, "On the Turbulent Heat Transfer by Free Convection from a Vertical Plate," J. Heat Mass Transfer, Vol. 11, pp. 1117-1126, 1968.
96. L. Baker, Jr., R. E. Paw, and F. A. Kulacki, "Post-Accident Heat Removal - Part I: Heat Transfer Within an Internally Heated Non-Boiling Liquid Layer," Nucl. Sci. Eng., 61, 222, 1976.
97. L. Boon-Long, T. W. Lester, and R. E. Faw, "Convective Heat Transfer in an Internally Heated Horizontal Fluid Layer with Unequal Boundary Temperatures," Intl. J. Heat Mass Transfer, 22, 437, 1979.
98. R. J. Henninger and R. E. Alcouffe, "Effects of Fuel-Sodium Film Interaction and Delayed Fission Gas Release on Extended Fuel Motion in a High-Power LMFBR Subassembly," Trans. Am. Nucl. Soc., Vol. 34, p. 524, June 1980.
99. H. K. Fauske, "Some Aspects of Liquid-Liquid Heat Transfer and Explosive Boiling," Proc. Fast Reactor Safety Mtg., CONF-740401, Beverly Hills, CA, April 2-4, 1974.
100. D. H. Cho and M. Epstein, "Work Potential from a Mechanical Disassembly of the Voided FFTF Core," Argonne National Laboratory, ANL/RAS 74-17, August 1974.
101. C. R. Bell, et al., "Advances in the Mechanistic Assessment of Post-Disassembly Energetics," Proc. of the International Meeting on Fast Reactor Safety Technology, Seattle, WA, August 1979.
102. R. J. Tobin and D. J. Cagliostro, "Effects of Vessel Internal Structures on Simulated HCDA Bubble Expansions," SRI International Technical Report No. 5, November 1978.

103.

T. G. Theofanous and M. Saito, "The Termination Phase of Core Disruptive Accidents in LMFBRs," PNE-79-146, School of Nuclear Engineering, Purdue University, W. Lafayette, Indiana, December 1979.

References

1. "Assessment of LMFBR Primary Control Rod Systems Test Program," T-SCT-LHC-80-20, Westinghouse Electric Corporation, Advanced Reactors Division.
2. "Integrated Test Program Plan for the Large Breeder Reactor Secondary Control Rod Unit," GEFR-00519(DR), General Electric Company, Advanced Reactor Systems Department.
3. "Reliability Assessment of CRBRP Reactor Shutdown System," WARD-D-0018, (November 1975).
4. W. S. Woodward and R. J. Baloh, "Common-Cause Failure Assessment Specification for the CRBRP Reactor Shutdown System," CRBRP-ARD-0195, Westinghouse Electric Corporation, (July 1978).
5. "An Update of the Preliminary Reliability Prediction for CRBRP Shutdown Heat Removal System," NEDM-14082, General Electric Company, January 1976.
6. D. H. Cho, et al., "Analysis of CAMEL C2 Single-pin Fuel Sweepout Test," ANL/RAS 78-33, June 1978.
7. R. Simms, et al., "An Interpretation of Fuel Motion in Recent TREAT Experiments with LMFBR Fuel," ANL/RAS 79-18, July 1979.
8. R. Simms, et al., "Fuel Motion in Experiments Simulating LMFBR Loss-of-Flow Accidents," ANL/RAS 80-25, November 1980.
9. A. DeVolpi, et al., "Fast Neutron Hodoscope at TREAT: Methods of Quantitative Determination of Fuel Dispersal," ANL/RAS 80-17, August 1980.
10. J. M. Kramer, "Comparison and Evaluation of Transient Fuel Pin Behavior Codes," ANL/RAS 80-22, September 1980.
11. D. R. Ferguson, et al., "A Study of the LOA-2 Termination Potential of the LOF Accident in LMFBRs," Proceedings of the International Meeting on Fast Reactor Safety Technology, Seattle, WA, August 19-23, 1979.
12. R. Simms, et al., "TREAT Experimental Data Base Regarding Fuel Dispersals in LMFBR Loss-of-Flow Accidents," ANS on Reactor Safety Aspects of Fuel Behaviour Topical Meeting, Sun Valley, Idaho, August, 1981.
13. R. G. Palm, et al., "F1 Phenomenological Tests on Fuel Motion: Final Report," ANL-78-50 (May 1978).
14. R. G. Palm, et al., "F2 Phenomenological Test on Fuel Motion: Final Report," ANL/RAS 80-24 (October 1980).
15. R. G. Palm, "LOF-Initiation Experiments F3 and F4," in USDOE Fast Reactor Safety Program Progress Report, Oct-Dec, 1980, ANL/TMC 81-1.
16. G. R. Fenske, G. Bandyopadhyay, "Summary Report on DEH Experiment on Irradiated Mixed Oxide Fuel," ANL/MSD 81-2, 1981.



## References (Continued)

17. A. M. Tentner and H. U. Mider, "LEVITATE - A Mechanistic Model for the Analysis of Fuel and Cladding Dynamics Under LOF Conditions for SAS4A," Proc. Int. Mtg. Fast Reactor Safety, Seattle, Wash. (1979).
18. "ANL Safety Experiments Program Plan," ANL/RAS 80-3, June 1980.
19. A. E. Klickman, et al., "TREAT Experiment Plan for U.S.-DOE LMFBR Safety Program," Transactions ANS/ENS Topical Meeting: Reactor Safety Aspects of Fuel Behavior, Sun Valley, Idaho, August 1981.
20. F. J. Martin, "Bottled Transition Phase Analysis-Preliminary Report," HEDL-TME-78-64, April 1980.
21. M. Epstein, et al., "Incipient Stratification and Mixing in Aerated Liquid-Liquid or Liquid-Solid Mixtures," Chem. Eng. Sci., Vol. 36, pp. 734-737, 1981.
22. W. R. Bohl, et al., "An Analysis of Transient Undercooling and Transient Overpower Accidents without Scram in the Clinch River Breeder Reactor," ANL/RAS 75-29, July 1975.
23. E. E. Morris and T. Y. C. Wei, "An Assessment of the Unprotected LOF Accident in the CDS Phase II Heterogeneous Core Design," ANL/RAS 81-1, December 1980.
24. A. Padilla, Jr. and F. J. Martin, "Transition Phase Issues," HEDL-TC1865, December 1979.
25. S. J. Hakim, et al., "TRANSIT: A Multi-field, Multi-phase Computer Code for the Analysis of the Transition Phase in a FBR," ANL/RAS 78-28, August 1978.
26. L. R. Smith, et al., "SIMMER-II: A Computer Program for LMFBR Disrupted Core Analysis," NUREG/CR-0453, October 1978.
27. B. W. Spencer, et al., "Reactor Material Fuel Freezing Experiments Using Small-Bundle, CRBR-type Pins," ANL/RAS 79-11, July 1979.
28. M. Farahat, et al., "Experimental Simulation of Boiled-up Fuel Pools," ANL/RAS 78-24, June 1978.
29. J. D. McCormack and R. K. Hilliard, "Aerosol Measurement Techniques and Accuracy in CSTF," HEDL-SA-1981 FP, April 1980.
30. H. A. Morewitz, et al., "Experiments on Sodium Fires and their Aerosols," Nuclear Engineering and Design, Vol. 42, 1977.
31. H. A. Morewitz, et al., "Attenuation of Air Born Debris from LMFBR Accidents," Nuclear Technology, Vol. 46, 335, Dec. 1979.
32. "Annual Technical Progress Report-Reactor Safety-Government Fiscal Year 1979," ESG-DOE-13294, April 15, 1980, RI ESG.



### References (Continued)

33. A. K. Postma and R. K. Owen, "Comparison of Aerosol Behavior During Sodium Fires in the CSTF with the HAA-3B Code," HEOL-SA-1982 FP, April 1980.
34. "Nuclear Aerosols," CSNI/SOAR No. 1, OECD Nuclear Energy Agency, June 1979.
35. "Proceedings of the CSNI Specialists Meeting on Nuclear Aerosols in Reactor Safety," NUREG/CR-1724, October 1980, Oak Ridge National Laboratory.
36. E. L. Gluekier and L. Baker, Jr., "Post-accident heat removal in LMFBRs," Symposium on the Thermal and Hydraulic Aspects of Reactor Safety, Vol. 2: Liquid Metal Fast Breeder Reactors, Edited by J. C. Jones, Jr. and S. G. Bankoff, 1977, p. 283-323.
37. R. D. Peak, "Users Guide to CACECO Containment Analysis Code," HEDL-TME 79-22, June 1979.
38. R. S. Hubner, et al., "HAA-3 Users Report," AI-AEC-13088, Atomics International, March 1973.
39. "Hypothetical Core Disruptive Accident Considerations in CRBRP--Vol. 2: Assessment of Thermal Margin Beyond the Design Base," CRBRP-3, March 1980.
40. L. Baker, et al., "Core Debris Accommodation Program Plan," USDOE, July 1981.
41. S. E. Seeman, "MIDAS Documentation," TC-2073, Hanford Engineering Development Laboratory, September 1981.
42. S. M. Divakaruni, et al., "Safety Status Information System: A Critical Parameter Display Study," GEFR-00569(DR), General Electric Company, Advanced Reactor Systems Department, August 1981.
43. "Man-Machine Interface Program Plan for the LMFBR Safety Program," FRSTMC, 1981.
44. "LMFBR Safety Program Plan," Office of Reactor Research and Technology, U.S. Department of Energy, August 1980.
45. W. R. Bohl, et. al., "An Analysis of the Unprotected Loss-of-Flow Accident in the Clinch River Breeder with an End-of-Equilibrium-Cycle Core," ANL/RAS 77-15, 1977.
46. R. Simms, et al., "TREAT Experimental Data Base Regarding Fuel Dispersals in LMFBR Loss-of-Flow Accidents," ANS on Reactor Safety Aspects of Fuel Behavior Topical Meeting, Sun Valley, Idaho, August 1981.

References (Continued)

47. H. U. Wider, et. al., "The PLUTO2 Overpower Excursion Code and a Comparison with EPIC," Proc. Int. Mtg. Fast Reactor Safety, Seattle, Wash., 1979.
48. A. J. Page, et. al., "Preliminary Data Report for TREAT Test J1," ANL/RAS 79-27, 1979.
49. B. W. Spencer, et. al., "Fuel Motion in the CAMEL TOP-Simulation LMFBR Safety Tests," Int. Mtg. Fast Reactor Safety, Seattle, Wash., 1979.
50. R. J. Henninger, et al., "An Analysis of Selected Transient Undercooling Accidents Without Scram for the Clinch River Breeder Reactor with a Parfait Core," ANL/RAS 77-16, May 1977.
51. "An Assessment of HCDA Energetics in the CRBRP Heterogeneous Reactor Core," CRBRP-GEFR-00523, November 1981.
52. J. E. Cahalan, "Homogeneous/Heterogeneous LMFBR Core Design Safety and Licensing Trade-offs," ANL/RAS 80-2, February 1980.
53. "Hypothetical Core Disruptive Accident Considerations in CRBRP--Vol. 1: Energetics and Structural Margin Beyond the Design Base (Rev. 3)," CRBRP-3, August 1981.
54. J. E. Cahalan, et al., "The Status and Experimental Basis of the SAS4A Accident Analysis Code System," Proceedings of the International Meeting on Fast Reactor Safety Technology, Seattle, WA, August 19-23, 1979.
55. "CRBRP Safety Study--An Assessment of Accident Risks in the CRBRP," CRBRP-1, March 1977.
56. "Reactor Safety Study, Main Report," WASH-1400 (NUREG-75/014), October 1975.
57. J. A. Hartung, "Risk Allocation Status Report," N323TI000056, Rockwell International Energy Systems Group, August 1980.
58. "Single Plant Risk Model Development and Application," GEFR-00573(DR), Advanced Reactor Systems Department, General Electric Company, August 1981.
59. W. E. Knee, et al., Third European Reliability Data Bank Seminar, NCFR-R24, July 1980.
60. N. M. Greene, et al., A Data Base for Fast Reactor Safety Computer Codes - General Description, ORNL-5477/Vol. 1, January 1979.