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SURVEILLANCE & DIAGNOSTIC METHODS GROUP
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INTRODUCTION FOR THE 1980
SURVEILLANCE AND NOISE DIAGNOSTICS
RESEARCH REVIEW GROUP MEETING

PRESENTED AT THE SURVEILLANCE AND
NOISE DIAGNOSTICS RESEARCH REVIEW
GROUP MEETING IN BETHESDA, MARYLAND
SEPTEMBER 22, 1980

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WE WILL BE REPORTING

THE RESULTS OF OUR WORK FUNDED BY

THE OFFICE OF REGULATORY RESEARCH
DIVISION OF REACTOR SAFETY RESEARCH
PLANT INSTRUMENTATION, CONTROL & POWER
SYSTEMS BRANCH

AND

THE OFFICE OF NUCLEAR REACTOR REGULATION
DIVISION OF SYSTEMS INTEGRATION
CORE PERFORMANCE BRANCH

WE COMPLETED THE FOLLOWING TASKS DURING FY 80

- COMPLETED BWR STOCHASTIC MODEL AND EXTENDED TECHNIQUE TO INCLUDE IN-CORE VIBRATIONS
- COMPLETED LOOSE PARTS MONITORING EXPERIMENTS IN THE EGCR
- OBTAINED BASELINE SIGNATURES FROM B&W, CE AND W PLANTS (COST SHARED WITH NRR FIN B0735)
- COMPLETED STABILITY ANALYSIS OF EPRI PEACH BOTTOM NOISE DATA AND COMPARED RESULTS WITH ORNL CODE PREDICTIONS
- PROVIDED NRR ASSISTANCE IN ASSESSING TWO OPERATING REACTOR PROBLEMS (FUNDING SUPPLIED BY NRR FIN B0092)
- PREPARED A SUMMARY PAPER ON THE USE OF NOISE DIAGNOSTIC AND SURVEILLANCE TECHNIQUES
- CONCLUDED OUR PARTICIPATION ON THE ASME SUBCOMMITTEE ON PIPE VIBRATION MONITORING BY SUMMARIZING OUR METHOD VERIFICATION CALCULATIONS AT A NATIONAL ASME MEETING

WE ALSO COMPLETED

- A REPORT SUMMARIZING THE RESULTS OF THE LOOSE PARTS DETECTION STUDIES AT THE EGCR
- AN EVALUATION OF THE TECHNICAL MERIT FOR EXTENSION OF THE BASELINE SIGNATURE PROGRAM TO INCLUDE SIGNALS OTHER THAN NEUTRON NOISE
- AN EVALUATION OF TIME-SERIES ANALYSIS METHODS FOR POSSIBLE USE IN REACTOR SURVEILLANCE AND DIAGNOSTICS
- A REPORT SUMMARIZING OUR ASSESSMENT OF THE USEFULNESS OF NOISE ANALYSIS IN NUCLEAR PLANTS AND INDUSTRY CAPABILITIES FOR USING NOISE TECHNIQUES (NRR FIN B0735)
- INSTALLATION OF AN AUTOMATIC SURVEILLANCE SYSTEM AT SEQUOYAH-1
- INITIAL DETECTION EFFICIENCY CALCULATIONS FOR SUBCRITICAL REACTIVITY MONITORING BY THE ^{252}Cf SOURCE DRIVEN NEUTRON NOISE METHOD (NRR FIN B0735)

WE'VE PUBLISHED 19 REPORTS AND PAPERS THIS YEAR

1. F. J. Sweeney, "Modeling the Local Component of In-Core Neutron Detector Noise in a BWR," Trans. Amer. Nucl. Soc. 33, 854 (November 1979).
2. F. J. Sweeney, "Sensitivity of Detecting BWR Control Rod Vibrations Using Neutron Noise," Trans. Amer. Nucl. Soc. 33, 793 (November 1979).
3. B. R. Upadhyaya and M. Kitamura, "Monitoring BWR Stability Using Time Series Analysis of Neutron Noise," Trans. Amer. Nucl. Soc. 33, 342, (November 1979).
4. M. Kitamura, "Detection of Sensor Failures in Nuclear Plants Using Analytic Redundancy," Trans. Amer. Nucl. Soc. (June 1980).
5. W. H. Sides, Jr., and K. R. Piety, "Automated Pattern Recognition System for Noise Analysis," Trans. Amer. Nucl. Soc. (June 1980).
6. F. J. Sweeney and J. C. Robinson, "Relative Importance of Attenuation and Reactivity Effects in Explaining Local and Global BWR Neutron Noise," Trans. Amer. Nucl. Soc. (June 1980).
7. J. E. Stoneking and R. C. Kryter, "Screening Procedures for Vibrational Qualification of Nuclear Plant Piping," Proc. Fourth National Congress on Pressure Vessel and Piping Technology, San Francisco, August 1980.
8. F. J. Sweeney, A Theoretical Model of Boiling Water Reactor Neutron Noise, Ph.D. dissertation, The University of Tennessee (1980).
9. B. R. Upadhyaya and M. Kitamura, "Stability Monitoring of Boiling Water Reactors Using Time Series Analysis of Neutron Noise," submitted for publication in Nuclear Science and Engineering.
10. R. C. Kryter et al., "Application of Noise Analysis to Safety-Related Assessment and Reactor Diagnostics," Proc. International Meeting on Thermal Reactor Safety, Conf-800403, Knoxville, April 1980.
11. D. N. Fry, "Application of Noise Analysis to Safety-Related Diagnostics and Assessments," presented at the NRC Seventh Water Reactor Safety Research Information Meeting, National Bureau of Standards, November 1979.
12. W. T. King, Feasibility of ^{252}Cf Source Driven Neutron Noise Measurements in Water Moderated Reactors, Ph.D. dissertation, The University of Tennessee (1980).

CONTINUATION OF REPORTS AND PAPERS PUBLISHED THIS YEAR

13. F. Shahrokhi, Metallic Loose-Parts Detection and Characterization, Ph.D. dissertation, The University of Tennessee (1980).
14. M. Kitamura and B. R. Upadhyaya, "An Improved Time Series Modeling Approach for Diagnosis and Surveillance of Reactors," Proc. International Meeting on Thermal Reactor Safety, Conf-800403, Knoxville, April 1980.
15. J. C. Robinson and D. N. Fry, "Diagnostics at TMI Using Noise Analysis," Proc. International Meeting on Thermal Reactor Safety, Conf-800403, Knoxville, April 1980.
16. R. C. Kryter and D. N. Fry, "Noise Analysis in Nuclear Power Reactors --An Assessment of Usefulness and Industry Capabilities," Letter report for the Office of Nuclear Reactor Regulation (September 1980).
17. F. J. Sweeney et al., "Stochastic Modeling of BWR Neutron Noise," 13th Informal Meeting on Reactor Noise, Cadarach, France, May (1980).
18. W. H. Sides, Jr., "An Automated Noise Analysis System for Improving Plant Performance," NRC-IEEE Conference on Advanced Electrotechnology Applications to Nuclear Power Plants, Washington, DC, January 1980.
19. R. C. Gonzalez, "Application of Pattern Recognition Techniques to Nuclear Reactor Surveillance," Proc. IEEE Conf. Decision and Control, Vol. 2, p 1069-1071, December, 1979.