

OFFICE OF NUCLEAR REGULATORY RESEARCH



STATUS SUMMARY REPORT

RESEARCH RESULTS UTILIZATION

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PDR NUREG
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TABLE OF CONTENTS

<u>PAGE NO.</u>	<u>DESCRIPTION</u>
1	1.0 INTRODUCTION
3	2.0 RESEARCH INFORMATION LETTERS (RIL'S) AND SCHEDULING POST RIL ACTIVITIES
3	2.1 LIST OF ISSUED RIL'S
5	2.2 POTENTIAL APPLICABILITY OF RESEARCH RESULTS IN THE REGULATORY PROCESS
30	3.0 PROJECTED NEAR TERM RESEARCH INFORMATION LETTERS

1.0 INTRODUCTION

THIS REPORT ON "RESEARCH RESULTS UTILIZATION" PROVIDES STATUS AND CONTROL INFORMATION CONCERNING THE UTILIZATION OF RESEARCH RESULTS IN THE REGULATORY POLICIES AND PRACTICES OF THE NRC.

RESEARCH INFORMATION LETTERS -- (RIL'S) ARE PREPARED BY RES TO TRANSMIT RESEARCH RESULTS TO NRC USER OFFICES UPON COMPLETION OF A SUBSTANTIAL, COHERENT AND REASONABLY COMPLETE BODY OF EXPERIMENTAL AND/OR ANALYTICAL RESEARCH WORK. A RIL MAY COVER MATERIAL DEVELOPED FROM MORE THAN ONE RESEARCH PROJECT. THE USER/PROGRAM OFFICE(S) IN THE NRC REVIEW THE INFORMATION CONTAINED IN THE RIL AND CONSIDER ITS UTILIZATION IN THE REGULATORY PROCESS. SECTION 2.0 OF THIS REPORT LISTS THE RIL'S ISSUED TO DATE, TOGETHER WITH AN IDENTIFICATION OF THE RESEARCH PROGRAM MANAGER AND THE RESEARCH PROGRAM ELEMENT WHICH GENERATED THE RIL. THE POTENTIAL APPLICABILITY OF EACH RIL TO THE REGULATORY PROCESS IS ALSO IDENTIFIED HERE, AND COMMENTS FROM THE COGNIZANT RES AND USER OFFICE STAFF ARE SUMMARIZED WHICH RELATE TO THE EXPECTED IMPACT OF THE REPORTED RIL'S ON THE REGULATORY PROCESS. WHENEVER DEEMED APPROPRIATE BY MUTUAL AGREEMENT BETWEEN RES AND OTHER INVOLVED PROGRAM OFFICES, A POSITION PAPER MAY BE PREPARED TO INFORM THE COMMISSION ABOUT THE POTENTIAL APPLICATION OF RESEARCH RESULTS. BRIEFINGS MAY BE CONDUCTED FOR THE COMMISSION, THE ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS) OR OTHER APPROPRIATE GROUPS. PRESS RELEASES MAY ALSO BE MADE, AS APPROPRIATE. THESE EVENTS ARE SCHEDULED AND TRACKED IN THIS SECTION.

A LISTING OF ALL RIL'S THAT MAY BE GENERATED IN THE NEAR FUTURE (2 OR 3 YEARS) IS PRESENTED IN SECTION 3.0. THE SUBJECT, TITLE, IMPACT, TARGET DATE, AND RESEARCH REVIEW GROUP NUMBER, TITLE AND CHAIRMAN ARE SHOWN FOR EACH RIL.

RES IS RESPONSIBLE FOR DISTRIBUTING EACH NEW RIL TO COGNIZANT OFFICES AS THEY ARE ISSUED. RES AND OTHER COGNIZANT PROGRAM OFFICES ARE OBLIGATED TO COLLECT, REVIEW, AND FORWARD APPROPRIATE INFORMATION RELATING TO RILS AND ASSOCIATED FOLLOW-UP ACTIONS TO MPA. MPA IS RESPONSIBLE FOR REFLECTING NEW INFORMATION IN THIS PUBLICATION AND PRODUCTION AND DISTRIBUTION OF THIS PUBLICATION ON A QUARTERLY SCHEDULE.

ALL COMMENTS SHOULD BE FORWARDED IN WRITING TO: DIRECTOR, MPA
MAIL STOP 12105 MNBB
ATTN: C. FITZGERALD

SUMMARY OF IMPACT OF RILIS ON THE REGULATORY PROCESS

RIL#	INCREASED UNDERSTANDING OF PHENOMENON	TECH BASIS LICENSING REVIEW	REGU- LATION	REG. GUIDES	TECH SPECS	STD. DEVELOP.	STANDARD FORMAT & CONTENT	STANDARD REVIEW PLAN	INSPC. PROGRAM	LICENSEE REPORTING REQUIREMENT
1	YES	-	-	-	-	-	-	-	-	-
2	SOME	POSSIBLE	YES	POSS.	-	-	-	-	-	-
3	YES	-	-	-	-	-	-	-	-	-
4	YES	YES	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-
6	SOME	-	-	-	-	-	-	-	-	-
7	YES	-	-	-	-	-	-	-	-	-
8	YES	POSSIBLE	POSS.	POSS.	-	-	POSS.	-	-	-
9	YES	POSSIBLE	POSS.	POSS.	-	-	POSS.	-	-	-
10	YES	YES	-	-	-	-	-	-	-	-
11	POSS.	POSSIBLE	-	-	-	-	-	-	-	-
12	YES	YES	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-
14	YES	-	-	YES	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-
16	YES	YES	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-	-	-
18	POSS.	POSSIBLE	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-	-	-
20	-	-	-	YES	-	YES	-	-	-	-
21	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-

* - CURRENTLY BEING REVIEWED BY USER OFFICE(S)

0 - AWAITING COMMISSION APPROVAL ON PROPOSED ACTION PLAN FOR CHANGING ECCS RULE

2.1 LIST OF ISSUED RIL'S

RESEARCH INFORMATION LETTERS ISSUED BY RES TO DATE ARE LISTED BELOW IN TABLE 2.1, TOGETHER WITH THE DATE OF ISSUE, ASSOCIATED RESEARCH PROGRAM ELEMENT AND PROGRAM MANAGER.

PAGE NO.	RIL NO.	DATE ISSUED	RESEARCH INFORMATION LETTER TITLE	RES PROGRAM ELEMENT	PROJECT MANAGER
6	1	3/19/74	ORNL V-5 INTERMEDIATE VESSEL TEST RESULTS	PRIMARY SYS INTEG.	E. K. LYNN
7	2	5/20/74	SEISMOTECTONIC MAP OF THE EASTERN UNITED STATES	SITE SAFETY	J. HARBOUR
8	3	6/7/74	ORNL V-7 INTERMEDIATE VESSEL TEST RESULT	PRIMARY SYS INTEG.	E. K. LYNN
9	4	9/10/74	MAP SHORING REGENCY OF FAULTING IN COASTAL SOUTHERN CALIFORNIA	SITE SAFETY	J. HARBOUR
10	5	6/28/76	CONFIRMATORY PRESSURE VESSEL TEST UNDER PNEUMATIC LOADING	PRIMARY SYS INTEG.	E. K. LYNN
11	6	10/12/76	A CRITIQUE OF THE BOARD-HALL MODEL FOR THERMAL DETONATIONS IN THE UO ₂ -NA SYSTEM	FAST BREEDER REACTOR	R. WRIGHT
12	7	8/25/76	THE SIMMER CORE FOR ANALYSIS OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS IN LMFR'S	FAST BREEDER REACTOR	R. CURTIS
13	8	1/31/77	DECAY HEAT DATA APPLICABLE TO LOCA EVALUATION	FUEL BEHAVIOR	R. DISALVO
14	9	3/14/77	HIGH TEMPERATURE OXIDATION OF ZIRCALOY FUEL CLADDING IN STEAM	FUEL BEHAVIOR	M. PICKLESIMER
15	10	2/25/77	PRESSURE VESSEL FAILURE PROBABILITY PREDICTION (OCTAVIA CODE)	RISK ASSESSMENT	W. VESELY
16	11	9/15/77	IEEE NUCLEAR RELIABILITY DATA MANUAL	RISK ASSESSMENT	J. JOHNSON
17	12	6/16/77	MODIFICATIONS TO PRESSURE VESSEL FAILURE PROBABILITY PREDICTION (OCTAVIA CODE)	RISK ASSESSMENT	W. VESELY
18	13	11/11/77	RES/DUAL STRESSES IN WELDS	PRIMARY SYS INTEG.	E. K. LYNN
19	14	11/9/77	PHYSICAL SEPARATION CRITERIA FOR ELECTRICAL CABLE TRAYS (HORIZONTAL OPEN SPACE CONFIG.)	SYSTEMS ENG.	R. FEIT
20	15	12/1/77	CHARACTERIZATION OF BWR FEEDWATER NOZZLE CORNER CRACKS	PRIMARY SYSTEMS	E. K. LYNN
21	16	12/1/77	WARM PRESTRESSING	PRIMARY SYSTEMS	E. K. LYNN
22	17		POWER BURST FACILITY (GPBF) SINGLE ROD-POWER COOKING MISMATCH (PCM) TEST RESULTS	FUEL BEHAVIOR	R. VAN HOUTEN
23	18	11/9/77	FRANTIC COMPUTER CODE	RISK ASSESSMENT	F. GOLDBERG

PAGE NO.	REL. NO.	DATE ISSUED	RESEARCH INFORMATION LETTER TITLE	RES. PROGRAM ELEMENT	PROJECT MANAGER
24	19	1/31/78	GO METHODOLOGY ASSESSMENT	RISK ASSESSMENT	J. PITMAN
25	20	1/24/78	A STUDY OF PHYSICAL PROTECTION EQUIPMENT	SAFEGUARDS	E. RICHARD
26	21	3/24/78	CRITICAL REVIEW OF SODIUM HYDROXIDE AEROSOL TOXICITY	RISK ASSESSMENT	N. CULLINGFORD
27	23	4/10/78	"EASI" ADVERSARY SEQUENCE EVALUATION MODEL (COMPUTER GRAPHICS VERSION)	SAFEGUARDS	R. ROBINSON
28	24	4/10/78	"FESEM" ADVERSARY SEQUENCE EVALUATION MODEL	SAFEGUARDS	R. ROBINSON
29	25	3/21/78	FRIP-53	FUEL BEHAVIOR	G. MARINO

2.2. POTENTIAL APPLICABILITY OF RESEARCH RESULTS IN THE REGULATORY PROCESS

COMMENTS ARE OFFERED FROM RES AND FROM COGNIZANT USER OFFICES ON THE NATURE OF THE REPORTED RESULTS AND THEIR POTENTIAL (OR ACTUAL) APPLICABILITY TO ANY PART OF THE REGULATOR'S PROCESS, INCLUDING: A) TECHNICAL DATA SUPPORTING LICENSING REVIEWS OR REGULATORY JUDGMENT, B) EVALUATION CODES, C) INFORMATION APPLICABLE TO REGULATORY GUIDES OR STANDARDS, AND D) INFORMATION SUPPORTING JUDGMENTS REGARDING REGULATORY POLICY.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OR RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL # 1 DATE ISSUED: 3/19/74 RES PROGRAM ELEMENT: PRIMARY SYSTEM INTEGRITY
 RIL TITLE ORNL V-5 INTERMEDIATE VESSEL TEST RESULT. (ORNL HSST PROGRAM)
 SPONSORING OFFICE(S): RES RRG: #20-VESSEL INTEGRITY RESEARCH PR ECT MGR: E. K. LYNN

RES COMMENTS: EXPERIMENTAL EVIDENCE THAT A "SAFE" FAILURE MODE (LEAK-BEFORE-BREAK) FOR REACTOR PRESSURE VESSELS MAY EXIST WAS REPORTED FOR THE FIRST TIME. TESTS ON THE V-5 INTERMEDIATE VESSEL AT ORNL DEMONSTRATED THAT A LEAK OCCURRED INSTEAD OF A FRACTURE BREAK WHEN THE VESSEL WAS HEATED TO 190 F AND PRESSURIZED TO 26-600 PSI. FURTHER ANALYTICAL STUDY TO GENERALIZE THIS RESULT IS UNDERWAY.

POST RIL ACTIVITIES	USLR OFFICE REVIEW	DISCUSSION MEETING HELD	POSITION PAPER COMPLETED	COMMISSION BRIEFING HELD	ACRS BRIEFING HELD	PRESS RELEASE ISSUED	RESULTS IMPLEMENTED
OFFICE RESPONSIBLE.....	NRR/SD	---	---	---	---	---	NRR
SCHEDULED COMPLETION DATE...	---	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	N/A
ACTUAL COMPLETION DATE.....	9/9/77	---	---	---	---	---	N/A

COMMENTS FROM NRR BY: D. EISENHUT ON: 09/09/77 -
 DESCRIBE APPLICATION TO REGULATORY PROCESS: THE RESULTS OF THIS TEST ADDED TO THE STAFF'S UNDERSTANDING OF FRACTURES ORIGINATING AT FLAWS IN NOZZLE CORNERS OF HEAVY SECTION STEEL VESSELS. EVALUATION OF THE FINAL TEST REPORT FROM ORNL (NOT YET SUBMITTED) WILL BE NECESSARY TO JUDGE THE APPLICABILITY OF THE RESULTS TO A REACTOR VESSEL AND WHETHER DIFFERENCES BETWEEN THE TEST VESSEL AND REACTOR VESSEL CAN BE ACCOUNTED FOR BY ANALYSIS.
 DESCRIBE IMPACT OF RESULTS: WHILE ADDING TO OUR UNDERSTANDING OF VESSEL FAILURE MODES, THERE HAS BEEN NO DEFINITIVE IMPACT ON LICENSING AT THIS TIME.
 COMMENTS/REMARKS: THE OPINIONS EXPRESSED IN THE RIL REGARDING LEAK-BEFORE-BREAK ARE STILL SPECULATIVE.

COMMENTS FROM SD BY: P. RANDALL ON: 02/21/78 -
 (NOTE - THESE COMMENTS ARE 4 YEARS AFTER RIL WAS ISSUED.)
 RESULTS WILL PROVIDE PART OF DATA BASE FOR DEVELOPMENT OF R.G. ON TREATMENT OF FLAWS AT DISCONTINUITIES. LEAK-BEFORE-BREAK RESULT IS ENCOURAGING BUT CANNOT BE REGARDED AS A DEMONSTRATION THAT SOME WILL OCCUR IN A REACTOR VESSEL.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL # 2 DATE ISSUED: 5/20/74 RES PROGRAM ELEMENT: SITE SAFETY

RIL TITLE: SEISMOTECTONIC MAP OF THE EASTERN UNITED STATES

SPONSORING OFFICE(S): RES

REG: #54-GEOLOGY & SEISMIC CHARACTERISTICS RESEARCH PROJECT MGR: J. HARBOUR

RES COMMENTS: RIL 2 REPORTS A COMPILATION OF EARTHQUAKE FAULT DATA FOR THE EASTERN UNITED STATES. THESE DATA ARE USED BY LICENSE APPLICANTS IN PREPARATION OF MATERIAL FOR PRELIMINARY SAFETY ANALYSIS REPORTS.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE..	REVIEW	LEAD	COMPLETED	HOLD	HOLD	ISSUED	NRR
ACTUAL COMPLETION DATE.....	NRR/SD	---	---	---	---	---	1974
		UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	1974
		---	---	---	---	---	1974

COMMENTS FROM NRR BY: W. GAMMILL ON: 9/27/77 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: THIS RESEARCH DEVELOPED LIMITED SEISMOTECTONIC PROVINCES MAPPING OF THE EASTERN UNITED STATES AIMED AT IMPLEMENTING APPENDIX A REQUIREMENTS FOR DETERMINING SEISMIC DESIGN FOR NUCLEAR FACILITIES.
DESCRIBE IMPACT OF RESULTS: THE RESEARCH ADDED VERY LITTLE TO OUR KNOWLEDGE OF EARTHQUAKE PROCESSES IN THE EASTERN UNITED STATES WHICH COULD BE USED TO IMPLEMENT APPENDIX A REQUIREMENTS.
COMMENTS/REMARKS: CURRENT EARTHQUAKE MONITORING AND TECTONIC STUDIES SHOULD BE SYNTHESIZED TO DEVELOP AN APPLICABLE SEISMOTECTONIC MAP.

COMMENTS FROM SD BY: G. ROBBINS ON: 2/17/78 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: SEE ABOVE.
DESCRIBE IMPACT OF RESULTS: RESULTS INDICATED THAT THE BASIS FOR TECTONIC PROVINCE CONCEPT IN APPENDIX A TO 10 CFR PART 100 IS QUESTIONABLE. REPORT BEING USED IN CONSIDERATION OF REVISIONS TO APPENDIX A TO CFR 100.
COMMENTS/REMARKS: APPENDIX A NEEDS REVISION IN THIS AREA IF RIL #2 RESULTS IN PUBLICATION OF A SEISMO-TECTONIC MAP. IT WOULD PROBABLY BE REFERENCED IN A REVISION OF R.G. 4.7. GENERAL SITE SUITABILITY CRITERIA FOR NUCLEAR POWER STATIONS.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 3 DATE ISSUED: 8/7/76 RES PROGRAM ELEMENT: PRIMARY SYSTEM INTEGRITY

RIL TITLE: ORNL V-7 INTERMEDIATE VESSEL TEST RESULT. (ORNL HSST PROGRAM)

SPONSORING OFFICE(S): RES RRG: #20-VESSEL INTEGRITY RESEARCH PROJECT MSR: E. K. LYNN

RES COMMENTS: ADDITIONAL EXPERIMENTAL EVIDENCE IS DEMONSTRATED THAT A "SAFE" FAILURE MODE FOR REACTOR PRESSURE VESSELS MAY EXIST, NAMELY, "LEAK-BEFORE-BREAK". THESE RESULTS SUPPORT EARLIER RESULTS REPORTED IN RIL 21. IN THIS TEST, THE FLOW WAS 13-INCHES LONG AND 5-INCHES DEEP IN THE 6-INCH THICK PRESSURE VESSEL WALL. THE VESSEL WAS ABLE TO SUSTAIN TWICE THE DESIGN LOAD PRIOR TO PENETRATION OF THE FLOW THROUGH THE REMAINING THIN LIGAMENT OF VESSEL MATERIAL. THIS RESEARCH CONTRIBUTES TO OUR UNDERSTANDING OF VESSEL FAILURE MODE. THIS INCREASED UNDERSTANDING SUPPORTS THE NRR STAFF IN ITS REVIEW EFFORTS.

POST RIL ACTIVITIES	USER OFFICE REVIEW	DISCUSSION MEETING HELD	POSITION PAPER COMPLETED	COMMISSION		ACRS		PRESS		RESULTS IMPLEMENTED
				HELD	UNSCHED	HELD	UNSCHED	HELD	UNSCHED	
OFFICE RESPONSIBLE.....	NRR/SD	---	---	---	UNSCHED	---	---	---	---	NRR
SCHEDULED COMPLETION DATE..	---	UNSCHED	---	---	UNSCHED	---	---	---	---	N/A
ACTUAL COMPLETION DATE.....	9/9/77	---	---	---	---	---	---	---	---	N/A

COMMENTS FROM NRR BY: P. EISENHUT ON: 9/9/77 -
 DESCRIBE APPLICATION TO REGULATORY PROCESS: THE TEST RESULTS HAVE BEEN USEFUL IN ESTIMATING THE MARGIN OF SAFETY, IN TERMS OF FLAW SIZE, FOR A LARGE FLAW IN A HEAVY SECTION STEEL VESSEL TESTED AT UPPER SHELF TEMPERATURES. WHILE CRACK ADVANCEMENT THROUGH THE REMAINING WALL LIGAMENT WAS IN THE STABLE TEARING MODE, PRODUCING A LEAK, AND PRESSURE TO CAUSE LEAKAGE WAS MORE THAN TWICE THE VESSEL DESIGN PRESSURE, THESE RESULTS MAY HAVE BEEN MODIFIED BY THE SPECIAL EFFECTS OF THE TEST GEOMETRY.
 DESCRIBE IMPACT OF RESULTS: WHILE ADDING TO OUR UNDERSTANDING OF VESSEL FAILURE MODES, THERE HAS BEEN NO DEFINITIVE IMPACT ON LICENSING AT THIS TIME.
 COMMENTS/REMARKS: THE OPINIONS EXPRESSED IN THE RIL REGARDING LEAK-BEFORE-BREAK ARE STILL SPECULATIVE.

COMMENTS FROM SD BY: P. RANDALL ON: 9/21/77 -
 TYPE - THESE COMMENTS ARE 4 YEARS AFTER THE RIL WAS ISSUED.)
 I WOULD AGREE WITH THE ABOVE COMMENTS.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #1 4 DATE ISSUED: 9/10/74 RES PROGRAM ELEMENT: SITE SAFETY

RIL TITLE: MAP SHOWING REGENCY OF FAULTING IN COASTAL SOUTHERN CALIFORNIA

SPONSORING OFFICE(S): RES RRG: #54-GEOLOGY & SEISMIC CHARACTERISTICS RESEARCH PROJECT MGR: J. HARBOUR

RES COMMENTS: RIL 4 COVERED FAULTING IN COASTAL SOUTHERN CALIFORNIA AND IS REFERRED TO BY RIL WHEN CONSIDERING SEISMIC SAFETY QUESTIONS REGARDING PLANTS IN THE AREA COVERED.

	USER OFFICE	DISCUSSION MEETING	POSITION PAPER	COMMISSION BRIEFING	ACRS BRIEFING	PRESS RELEASE	SULTS ELEMENTED
POST RIL ACTIVITIES	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	
OFFICE RESPONSIBLE.....	NRR/SD	---	---	---	---	---	NRR
SCHEDULED COMPLETION DATE..	---	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	1975
ACTUAL COMPLETION DATE.....	9/27/77	---	---	---	---	---	1975

COMMENTS FROM NRR BY: W. GAMMILL DN: 9/27/77 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: TO BE USED IN SELECTING SITES FOR NUCLEAR FACILITIES AND FOR REGIONAL INPUT TO STAFF REVIEW OF NUCLEAR FACILITY APPLICATIONS.

DESCRIBE IMPACT OF RESULTS: WORK PROVIDED NEW KNOWLEDGE OF THE DISTRIBUTION OF ACTIVE FAULTS IN COASTAL CALIFORNIA. HAS PROVIDED INPUT TO OUR REVIEW OF DIABLO CANYON AND OTHER SITES.

COMMENTS/REMARKS: WORK HAS LARGELY BEEN COMPLETED. NO EXTENSION IS ANTICIPATED.

COMMENTS FROM SD BY: G. ROBBINS DN: 02/17/78 - NO IMPACT.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #1 5 DATE ISSUED: 6/28/76 RLS PROGRAM ELEMENT: PRIMARY SYSTEM INTEGRITY
 RIL TITLE: CONFIRMATORY PRESSURE VESSEL TEST UNDER PNEUMATIC LOADING. (CORNUL HSST PROGRAM)
 SPONSORING OFFICE(S): RES RRG: #20-VESSEL INTEGRITY RESEARCH PROJECT MGR: E. K. LYNN

RES COMMENTS: RIL'S 1, 3 & 5 REPORTED THE RESULTS FROM THE HEAVY SECTION STEEL TECHNOLOGY PROGRAM WHICH SHOWED THAT THE ANALYTICAL METHODS FOR PREDICTING FLAW INITIATION AND CRACK ARREST IN REACTOR PRESSURE VESSELS HAVE BEEN WELL VALIDATED. THESE VALIDATED ANALYTICAL METHODS (LINEAR ELASTIC FRACTURE MECHANICS AND ELASTIC-PLASTIC FRACTURE MECHANICS) ALLOW A PREDICTION OF THOSE CONDITIONS UNDER WHICH FLAWS IN PRESSURE VESSEL STEELS CAN CAUSE FAILURE OF THE VESSEL. THIS PROVIDES THE NRR STAFF WITH A NEW TECHNIQUE FOR SETTING SAFE LIMITS FOR NORMAL OPERATION AND FOR ABNORMAL AND ACCIDENT SITUATIONS TO REDUCE THE LIKELIHOOD OF PRESSURE VESSEL FAILURE.

POST RIL ACTIVITIES	OFFICE RESPONSIBLE	DISCUSSION MEETING HELD	POSITION PAPER COMPLETED	COMMISSION BRIEFING HELD	ACRS BRIEFING HELD	PRESS RELEASE ISSUED	RESULTS IMPLEMENTED
SCHEDULED COMPLETION DATE	NRR/SD	---	---	---	---	---	NRR
ACTUAL COMPLETION DATE	12/16/77	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE 1976

COMMENTS FROM NRR BY: J. KNIGHT ON: 12/16/77 -
 DESCRIBE APPLICATION TO REGULATORY PROCESS: THE INTERMEDIATE TEST VESSELS, ITV-7 AND ITV-7A UNDER SUSTAINED LOADING DEMONSTRATED THAT BOTH THE VESSELS RESPONDED TO PNEUMATIC LOADING ESSENTIALLY AS THEY HAD TO HYDRAULIC LOADING. EARLIER EXPERIENCE OF A RAPID CRACK EXTENSION IN THE GAS PIPE LINE WAS INHIBITING THE ACRS COMMITTEE ABOUT THE RESULTS OF ITV-TEST UNDER HYDRAULIC LOADING. HENCE, THE PNEUMATIC LOAD TEST WAS SUGGESTED.
 DESCRIBE IMPACT OF RESULTS: THESE TESTS SHOW THAT THE VESSELS UNDER SUSTAINED LOADING BEHAVED SIMILARLY TO HYDRAULIC LOADING, AND THE RESULTS ARE APPLICABLE TO THE EVALUATION OF THE BEHAVIOR OF REACTOR PRESSURE VESSELS UNDER SUSTAINED LOAD. THE TWO VESSEL TESTS THAT RUPTURED, WITHSTOOD PRESSURE 2.15 TO 2.75 TIMES DESIGN PRESSURE. THE TEST PRESSURES WERE ABOVE ASME B 3 P V CODE ALLOWABLE FOR FAULTED CONDITIONS.
 COMMENTS/REMARKS: TESTS DEMONSTRATE THE LEAK WITHOUT BURST.

COMMENTS FROM SD BY: P. RANDALL ON: 02/21/78 -
 THIS TEST RESULT AND THE ONE ON V-7 (RIL #3) ARE USEFUL IN SHOWING THAT BURST STRAIN IN FAILURES ON THE UPPER SHELVE OF TOUGHNESS ARE CLOSELY RELATED TO RATIO U/T (CRACK DEPTH/THICKNESS).

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

REL 8: 6 DATE ISSUED: 10/12/76 RES PROGRAM ELEMENT: FAST BREEDER REACTORS

REL TITLE: A CRITIQUE OF THE BOARD-HALL MODEL FOR THERMAL DETONATIONS IN THE UO₂-NA SYSTEM

SPONSORING OFFICE(S): NRR RRS: #24-THERMAL-MECHANICAL INTERACTION RESEARCH PROJECT MGR: R. WRIGHT

RES COMMENTS: THIS CRITIQUE OF THE BOARD-HALL THEORY FOR THERMAL EXPLOSIONS IN A URANIUM OXIDE-SODIUM SYSTEM REINFORCED THE BELIEF THAT SUCH DETONATIONS ARE OF LOW PROBABILITY. THE CRITIQUE HAS BEEN USED AS AN AID IN ANSWERING ACRS CONCERNS ABOUT THE POSSIBILITY OF ENERGETIC FUEL-COOLANT INTERACTIONS IN ADVANCED REACTORS AND WAS EMPLOYED IN SUPPORTING NRR'S POSITION IN THE EVALUATION OF THE PRELIMINARY SAFETY ANALYSIS REPORT FOR THE CLINCH RIVER BREEDER REACTOR.

	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
POST REL ACTIVITIES	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
OFFICE RESPONSIBLE.....	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	NRR
SCHEDULED COMPLETION DATE..	NRR	--	--	--	--	--	1977
ACTUAL COMPLETION DATE....	--	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	1977
		--	--	--	--	--	

COMMENTS FROM NRR BY: R. DENISCH, SPEIS, ON: 9/9/77 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: ESTIMATES OF THERMAL DETONATION ENERGIES ARE DIRECTLY RELEVANT IN LICENSING DECISIONS RELATED TO CONTAINMENT REQUIREMENTS FOR LMFR, PARTICULARLY KINETIC ENERGY RELEASE. SYSTEM DAMAGE AND RADIO-ACTIVITY RELEASES. THE REL TRANSMITTED A CRITIQUE OF THE BOARD AND HALL (OXAEA) THEORY FOR THERMAL EXPLOSIONS IN THE UO₂-SODIUM SYSTEM. THIS INDEPENDENT THEORETICAL ASSESSMENT IS USEFUL IN REINFORCING THE CURRENT NRR BELIEF THAT SUCH DETONATIONS ARE OF LOW PROBABILITY AND THAT FURTHER EXPERIMENTAL EFFORT IS REQUIRED.

DESCRIBE IMPACT OF RESULTS: THE RESULTS OF THE CRITIQUE ARE MINIMAL IN THIS ON-GOING TECHNOLOGICAL EXPLORATION, EXCEPT AS NOTED ABOVE IN REINFORCING THE IDENTIFIED PRECEPTIONS AND NEED FOR EXPERIMENTS. SUCH WORK, INDEPENDENT ASSESSMENTS OF IDENTIFIED AND POTENTIAL SIGNIFICANT SAFETY ISSUES, SHOULD CONTINUE.

COMMENTS/REMARKS: THE INITIAL EFFORT OF AN EXPERIMENTAL AND ANALYTICAL EVALUATION OF THE BOARD AND HALL MODEL OF THERMAL EXPLOSIONS WAS UNDERTAKEN BY DPM AT THE REQUEST OF THE ACRS (ACRS REQUEST DATED JULY 9, 1975 FOR BOARD AND HALL REVIEW). NOTE DPM RESPONSE TO THIS REQUEST IN A LETTER FROM R. P. DENISE TO M. LIBARKIN, ACRS, DATED OCTOBER 24, 1975. THE PHENOMENON IS APPLICABLE IN THE ONGOING REVIEW OF THE FFTF REACTOR.

NRR HAS BEEN IN CONTINUING CONTACT WITH RES STAFF ON THE RESEARCH PROGRAMS PERTAINING TO INVESTIGATIONS ON THE BOARD AND HALL EFFECT, AND THE GENERAL SUBJECT OF THERMAL EXPLOSIONS, AND MAINTAINS COGNIZANCE OF SUCH WORK IN THE U.S. AND OTHER COUNTRIES.

RIL # 7 DATE ISSUED: 8/25/76 RES PROGRAM ELEMENT: FAST BREEDER REACTORS

RIL TITLE: THE SIMMER CODE FOR ANALYSIS OF HYPOTHETICAL CORE DISRUPTIVE ACCIDENTS IN LMFR'S

SPONSORING OFFICE(S): NRR RES: #48-SIMMER CODE RESEARCH PROJECT MGR: R. CURTIS

RES COMMENTS: THE SIMMER CODE IS DESIGNED TO PREDICT THE MOTION OF FAST REACTOR CORES DURING POTENTIAL CORE DISRUPTIVE ACCIDENTS. A TRIAL VERSION OF THIS CODE WAS MADE AVAILABLE TO NRC'S LICENSING STAFF AND HAS SUPPORTED NPC BRANCH POSITIONS ON THE ANALYSIS OF CORE DISRUPTIVE ACCIDENTS FOR CLINCH RIVER BREEDER REACTOR LICENSING CONSIDERATIONS. SIMMER IS RECOGNIZED AS AN IMPORTANT FIRST STEP IN THE DEVELOPMENT OF A MECHANISTIC CODE CAPABLE OF DESCRIBING PHENOMENA NEEDED TO ASSESS CORE DISRUPTIVE ACCIDENTS IN LIQUID METAL FAST BREEDER REACTORS.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE..	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	NRR
ACTUAL COMPLETION DATE.....	NRR	---	---	---	---	---	1976
	---	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	1976
	9/9/77	---	---	---	---	---	---

COMMENTS FROM NRR BY: P. DENISE/T. SPEER'S ON 9/9/77 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: THE SUBJECT RIL ANNOUNCED THE AVAILABILITY OF THE SIMMER-1 CODE. THE SIMMER-1 CODE IS RECOGNIZED BY NRR AS AN IMPORTANT FIRST STEP IN THE DEVELOPMENT OF A MECHANISTIC CODE CAPABLE OF DESCRIBING REACTIVITY, TRANSITION PHASE PHENOMENA, AND WORK ENERGY PARTITION, ALL VITAL TO ASSESSING CORE DISRUPTIVE ACCIDENTS IN LMFRS.

DESCRIBE IMPACT OF RESULTS: THERE IS NO IMPACT SINCE RESULTS USING THE SIMMER-1 CODE ARE NOT SUFFICIENTLY SUBSTANTIATED TO BE USED DIRECTLY IN THE LICENSING DECISIONS FOR LMFR'S. IT IS ANTICIPATED THAT FURTHER CODE DEVELOPMENT, AND THE PERFORMANCE OF EXPERIMENTS WHICH CONFIRM THE COMPUTATIONAL MODELS, WILL YIELD A TOOL WHICH WILL BE USEFUL IN REACHING SIGNIFICANT LICENSING DECISIONS.

COMMENTS/REMARKS: NRR VIEWS THE SIMMER PROGRAM AS AN IMPORTANT LONG TERM EFFORT TO DESCRIBE THERMAL AND MECHANICAL CORE DISRUPTION ACCIDENT SEQUENCES. NRR ALSO SEES NEAR-TERM BENEFIT IN USING SIMMER TO BETTER UNDERSTAND KEY PHENOMENA, AND THE INTEGRATION OF THESE PHENOMENA INTO AN ACCIDENT SEQUENCE. SIMMER ALSO HAS THE BENEFIT OF BEING LARGELY INDEPENDENT OF ERDA SPONSORED WORK. NRR HAS BEEN IN CONSTANT COMMUNICATION WITH ARSR AND HAD INITIATED A SMALL T.A. EFFORT WHICH MAKES USE OF SIMMER. NRR STAFF HAVE ATTENDED SIMMER WORKSHOPS AND BRIEFINGS ON 9/14-15/76, 4/19/77 AND 7/21-22/77. NRR CORRESPONDENCE RELATED TO SIMMER AND SIMMER-RELATED WORK CONDUCTED BY RSR:

1. TO SAUL LEVINE, RES FROM B. RUSCHE, NRR, "LMFR SAFETY RESEARCH PROGRAM PLAN", 3/15/77.
2. TO L. S. RUBENSTEIN FROM R. P. DENISE, "DEGREE OF SUPPORT FOR RESEARCH PROGRAMS FOR ADVANCED REACTORS", 7/6/77 (CC. TO C. KELLER).
3. TO E. G. CASE FROM R. P. DENISE, "NRR COMMENTS TO ACRS ON ARSR PROGRAM", 7/15/77.
4. TO SAUL LEVINE, RES. FROM E. CASE, NRR, "RES INFORMATION ON THE UNDERSTANDING OF CDA ENERGISTICS IN LMFR'S".

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 8 DATE ISSUED: 1/31/77 RES PROGRAM ELEMENT: FUEL BEHAVIOR

RIL TITLE: DECAY HEAT DATA APPLICABLE TO LOCA EVALUATION

SPONSORING OFFICE(S): RES ERG: #11-DECAY HEAT RESEARCH PROJECT MGR: R. DISALVO

RES COMMENTS: RECENT CALCULATIONS AND EXPERIMENTS WERE PERFORMED TO DETERMINE A BEST ESTIMATE OF THE VALUE OF THE RESIDUAL (DECAY) HEAT GENERATED IN NUCLEAR FUEL AFTER SHUTDOWN. THE VALUE CHOSEN FOR RESIDUAL HEAT RATE PLAYS A VERY IMPORTANT PART IN PREDICTING THE PERFORMANCE OF ECC SYSTEMS. RESULTS INDICATE THAT THE DECAY HEAT RATE CURRENTLY USED HAS A 27% MARGIN OVER THE NEWLY DETERMINED VALUE. THIS INDICATES A SIGNIFICANT CONSERVATISM IN CURRENT LICENSING BASES AND THEY ARE NOW BEING REEXAMINED. RIL'S 8 & 9 ARE BOTH UNDER REVIEW BY NRR FOR POSSIBLE INCLUSION IN A MODIFICATION TO THE EMERGENCY CORE COOLING SYSTEMS (ECCS) RULE PROVIDED IN APPENDIX K OF 10 CFR 50. THESE RIL'S REPORTED ON COMPLETED RESEARCH PROJECTS IN FISSION PRODUCT DECAY HEAT AND ZIRCALOY OXIDATION WHICH RESULTED IN DATA BASES AND CORRELATIONS WHICH INDICATE THAT THOSE IN CURRENT USE IN THE ECCS RULE ARE HIGHLY CONSERVATIVE. A COMMISSION PAPER WAS PREPARED (SECV 77-368) ON JULY 1, 1977. PRESENT STAFF PROGRESS ON A PROPOSED ACTION PLAN REGARDING POSSIBLE MODIFICATION TO THE ECCS RULE. THE COMMISSION PAPER (SECV 7826) PRESENTING THE PROPOSED ACTION PLAN WAS PREPARED ON JANUARY 18, 1978.

	USER OFFICE	DISCUSSION MEETING	POSITION PAPER	COMMISSION BRIEFING	ACRS BRIEFING	PRESS RELEASE	RESULTS
	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	IMPLEMENTED
<u>POST RIL ACTIVITIES</u>							
OFFICE RESPONSIBLE.....	NRR,SD	--	--	NRR	NRR,SD,RES	NRR,SD,RES	NRR
SCHEDULED COMPLETION DATE..	--	UNSCHED	DEFERRED	9/8/77	--	--	1978
ACTUAL COMPLETION DATE....	9/9/77	--	--	9/10/77	7/26/77	9/9/77	--

COMMENTS FROM NRR BY: D. ROSS ON: 9/19/77 -

DISCUSS APPLICATION TO REGULATORY PROCESS: 1. NEW DATA IS BEING CONSIDERED AS PARTIAL BASIS FOR MODIFICATION OF PRESENT ECCS RULE (10 CFR 50.46 AND APPENDIX K). PROPOSED OPTIONS FOR RULE CHANGE INCLUDE ACCEPTABILITY OF NEW DECAY HEAT DATA IN ECCS LICENSING CALCULATIONS.

2. NEW DATA WILL BE INCORPORATED IN "BEST ESTIMATE" ANALYSIS CODES. THESE CODES ARE INTENDED TO BE USED IN PROBABILISTIC ASSESSMENT OF SAFETY MARGINS.

DISCUSS IMPACT OF RESULTS: 1. NEW DATA CONFIRMS MARGINS ALLOTTED IN PRESENT ECCS RULE ARE CONSERVATIVE.

2. IF ACCEPTED FOR USE IN LOCA LICENSING CALCULATIONS, VENDORS COULD USE ADDITIONAL MARGIN IN DESIGN. (IE., INCREASE PEAK KW/FT, ETC.).

COMMENTS/REMARKS: OPTIONS FOR CHANGING PRESENT ECCS RULE PRESENTLY UNDER STUDY BY STAFF. INITIATIONS OF RULE CHANGE MUST BE DECIDED BY THE COMMISSION.

COMMENTS FROM SD BY: V. PANGIERA ON: 9/1/77 -

IF PROPOSED PLAN FOR ECCS RULE CHANGE IS APPROVED BY THE COMMISSION, SD, IN COORDINATION WITH NRR AND RES, WILL IMPLEMENT THE RULE CHANGE PROCESS.

RILE: 9 DATE ISSUED: 3/14/77 RES. PROGRAM ELEMENT: FUEL BEHAVIOR

RIS TITLE: HIGH TEMPERATURE OXIDATION OF ZIRCALOY FUEL CLADDING IN STEAM

SPONSORING OFFICE(S): RES

RRG: #0-ZIRCALOY CLADDING

RESEARCH PROJECT MGR: M. L. PICKLESIMER

RES. COMMENTS: THE REPORTED RESULTS IMPROVE OUR UNDERSTANDING OF THE BEHAVIOR OF ZIRCALOY FUEL CLADDING IN AN ENVIRONMENT REPRESENTED BY A LOSS OF COOLANT ACCIDENT (LOCA). THEY INDICATE THAT THERE WOULD BE SIGNIFICANTLY LESS DEPTH OF ENRICHMENT IN THE FUEL CLADDING WALL, CALCULATED FOR ANY POSTULATED LOCA AND MORE WALL MATERIAL WILL BE LEFT WHICH IS CAPABLE OF SUSTAINING LOADS LATER IN THE SEQUENCE OF SUCH AN ACCIDENT. THIS INFORMATION TOGETHER WITH DATA ON THE RATE OF GROWTH OF OXIDE AND OXYGEN - STABILIZED LAYERS IN CLADDING, PROVIDES A MORE SCIENTIFIC BASE FOR ESTABLISHING FUEL CLAD ENRICHMENT CRITERIA FOR EMERGENCY CORE COOLING SYSTEM ACCEPTANCE. THESE RESULTS CONFIRM THAT THERE IS A DEGREE OF CONSERVATISM IN THE EVALUATION MODEL BEING USED BY THE REGULATORY STAFF FOR CALCULATING THE OXIDATION OF ZIRCALOY DURING A POSTULATED LOCA. THIS INFORMATION IS BEING CONSIDERED AS A PARTIAL BASIS FOR MODIFICATION OF THE PRESENT ECCS RULE (10CFR 50, APPENDIX K). RIL'S 3 & 9 ARE BOTH UNDER CONSIDERATION BY NRR FOR POSSIBLE INCLUSION IN A MODIFICATION TO THE EMERGENCY CORE COOLING SYSTEMS (ECCS) RULE PROVIDED IN APPENDIX K OF 10 CFR 50. THESE RIL'S REPORTED ON COMPLETED RESEARCH PROJECTS IN FISSION PRODUCT DECAY HEAT AND ZIRCALOY OXIDATION WHICH RESULTED IN DATA BASES AND CORRELATIONS WHICH INDICATE THAT THESE IN CURRENT USE IN THE ECCS RULE ARE HIGHLY CONSERVATIVE. A COMMISSION PAPER WAS PREPARED (SECY 77-368) ON JULY 1, 1977, PRESENT STAFF PROGRESS ON A PROPOSED ACTION PLAN REGARDING POSSIBLE MODIFICATION TO THE ECCS RULE, AND THE COMMISSION PAPER (SECY 70-26) PRESENTING THE PROPOSED ACTION PLAN WAS PREPARED ON JANUARY 10, 1978. RIL 49 HAS BEEN REVIEWED BY NRR, NUS, IE, AND SO. THIS MATERIAL WAS INCLUDED IN THE BRIEFING OF THE ACRS FULL COMMITTEE BY NRR IN SEPTEMBER, 1977, CONCERNING A POSSIBLE REVISION OF APPENDIX K OF 10 CFR 50. THE ACRS DISCOURAGED A REVISION OF THE ECCS RULE AT THIS TIME.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBILITY	OFFICER	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	
9/28/77	NRR/SO	UNUSCH	DEFERRED	NRR	UNUSCH	UNUSCH	NRR
9/28/77	---	---	---	9/10/77	---	---	1978
---	---	---	---	---	---	---	1978

COMMENTS FROM NRR BY: D. ROSS, DNL 9/28/77 --
 DISCUSS APPLICATION TO REGULATORY PROCESS: 1. NEW DATA MAY BE CONSIDERED AS PARTIAL BASIS FOR MODIFICATIONS OF PRESENT ECCS RULE (10 CFR 50, APPENDIX K).

2. NEW DATA MAY BE USED IN "BEST ESTIMATE" CODES. THESE CODES ARE INTENDED TO BE USED IN PROBABILISTIC ASSESSMENTS OF SAFETY MARGINS.

DESCRIPTIVE SUMMARY OF RESULTS: 1. NEW DATA CONFIRMS MARGIN ALLOTTED IN PRESENT ECCS RULE IS CONSERVATIVE.

2. IF ACCEPTED FOR USE IN LOCA LICENSING CALCULATIONS, VENDORS COULD USE ADDITIONAL MARGIN IN DESIGN (I.E., INCREASE PEAK K₁/K₂).

COMMENTS/REMARKS: OPTION FOR CHANGING PRESENT ECCS RULE WAS DISCOURAGED BY ACRS. INITIATION OF RULE CHANGE MUST BE DECIDED BY THE COMMISSION.

COMMENTS FROM SO BY: Y. YACOBURA, DNL 2/22/78 --

IF PROPOSED PLAN FOR ECCS RULE CHANGE IS APPROVED BY THE COMMISSION, SO, IN COORDINATION WITH NRR AND RES, WILL IMPLEMENT THE RULE CHANGE PROCESS.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 10 DATE ISSUED: 2/25/77 RES PROGRAM ELEMENT: RISK ASSESSMENT/PRIMARY SYSTEMS INTEGRITY

RIL TITLE: PRESSURE VESSEL FAILURE PROBABILITY PREDICTION

SPONSORING OFFICE(S): RES RRG: #20-VESSEL INTEGRITY RESEARCH PROJECT MGR: W. VESELY

RES COMMENTS: OCTAVIA IS A COMPUTER CODE FOR PREDICTING FAILURE PROBABILITIES IN REACTOR PRESSURE VESSELS AS A FUNCTION OF TEMPERATURES AND PRESSURES THAT MIGHT OCCUR DURING STARTUP AND SHUTDOWN OPERATIONS. EFFECTS OF MATERIAL PROPERTIES AND OPERATING AGE WERE ALSO INCLUDED. THE RESULTS INDICATED THAT EXISTING SAFETY MARGINS COULD BE SIGNIFICANTLY REDUCED WITH CONTINUED AGING (RESULTING IN RADIATION EMBRITTLEMENT) OF THE REACTOR VESSEL. IF THE RATE OF OCCURRENCE OF OVERPRESSURE EVENTS CONTINUES TO BE SIMILAR TO THAT PREVIOUSLY OBSERVED. FURTHER IMPROVEMENTS IN THE CODE ARE REPORTED ON IN RIL 12. THESE RESULTS WERE USED BY NRR DURING THIS PAST YEAR IN REVIEWING THE PROBABILITY OF FAILURE OF REACTOR PRESSURE VESSELS DUE TO SUCH EVENTS AND TO GIVE GUIDANCE ON PLANT IMPROVEMENTS THAT MAY BE NEEDED. THEY MAY ALSO BECOME THE BASIS FOR REVISING REGULATORY GUIDES OR STANDARDS.

	USER OFFICE	DISCUSSION MEETING	POSITION PAPER	COMMISSION BRIEFING	ACRS BRIEFING	PRESS RELEASE	RESULTS
POST RIL ACTIVITIES	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	IMPLEMENTED
OFFICE RESPONSIBLE.....	NRR/SD	---	---	---	---	---	NRR
SCHEDULED COMPLETION DATE..	---	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	1977
ACTUAL COMPLETION DATE.....	9/9/77	---	---	---	---	---	1977

COMMENTS FROM NRR BY: D. EISENHUT ON: 9/9/77 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: THE OCTAVIA COMPUTER CODE HAS BEEN USED TO EVALUATE THE PROBABILITY OF REACTOR VESSEL FAILURE FROM OVERPRESSURE TRANSIENTS WHICH CAN OCCUR DURING PUR OPERATION. THE RESULTS OF THE ANALYSES INDICATED THAT EXISTING SAFETY MARGINS COULD BE SIGNIFICANTLY REDUCED WITH CONTINUED NEUTRON IRRADIATION OF THE REACTOR VESSEL IF THE HISTORICAL FREQUENCY OF OVERPRESSURE EVENTS CONTINUED.

DESCRIBE IMPACT OF RESULTS: THE ANALYSES ENABLED NRR TO CONFIRM, IN A MORE RIGOROUS, QUANTITATIVE MANNER, INITIAL LICENSING DECISIONS TO REDUCE THE FREQUENCY AND MAXIMUM PRESSURE OF THE TRANSIENTS. THESE DECISIONS RESULTED IN MODIFICATIONS TO OPERATING PROCEDURES FOR REDUCING THE FREQUENCY OF TRANSIENTS AND THE INSTALLATION OF PHYSICAL DEVICES TO LIMIT PRESSURES IN OPERATING PLANTS TO THOSE SPECIFIED BY THE PRESSURE-TEMPERATURE LIMITATIONS IN THE TECHNICAL SPECIFICATIONS.

COMMENTS/REMARKS: NONE

COMMENTS FROM SD BY: P. RANDALL ON: 02/21/78 -

RESULTS TO DATE SEEM TO BE AN INCOMPLETE PROBABILITY ANALYSIS BUT REPRESENT A USEFUL PRODUCT FOR ANALYZING ACCIDENT CONDITIONS WHERE NO REQUIRED SAFETY MARGINS HAVE BEEN ESTABLISHED.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL # 11 DATE ISSUED: 9/15/77 RES. PROGRAM ELEMENT: RISK ASSESSMENT
 RIL TITLE: IEEE NUCLE-R RELIABILITY DATA MANUAL
 SPONSORING OFFICE(S): RES ARG: NONE RESEARCH PROJECT MGR: J. JOHNSON

RES. COMMENTS: A FAILURE RATE DATA MANUAL WAS DEVELOPED WHICH CAN BE USED IN RISK AND RELIABILITY ANALYSIS OF REACTOR SYSTEMS. THE MANUAL CONTAINS FAILURE RATES AND FAILURE MODE INFORMATION FOR OVER 1,000 ELECTRICAL, ELECTRONIC AND SENSING COMPONENTS USED IN NUCLEAR POWER PLANTS. A METHOD IS GIVEN FOR COLLECTING AND PRESENTING RELIABILITY DATA FOR QUANTITATIVE RELIABILITY AND AVAILABILITY EVALUATIONS OF SAFETY-RELATED NUCLEAR PLANT SYSTEMS. UNCERTAINTY BOUNDS ARE ALSO GIVEN FOR EACH ESTIMATE OF A COMPONENT FAILURE RATE. THIS WORK IS PART OF A CONTINUING EFFORT TO ESTABLISH AN INTERIM DATA BASE FOR USE IN MEETING NRC NEEDS IN THE ELECTRICAL AND ELECTRONIC AREA UNTIL SIGNIFICANT OPERATING DATA ON COMPONENTS USED IN THE NUCLEAR INDUSTRY BECOME AVAILABLE.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE..	RELVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	NRR
ACTUAL COMPLETION DATE.....	NRR	--	--	--	--	--	4/30/78
	--	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	--
	10/25/77	--	--	--	--	--	--

COMMENTS FROM NRR BY: R. TEDESCHI ON: 10/25/77 --

DESCRIBE APPLICATION TO REGULATORY PROCESS: THE SUBJECT RIL ANNOUNCED THE AVAILABILITY OF A FAILURE RATE DATA MANUAL. THIS DATA SUPPLEMENTS OTHER SOURCES OF RELIABILITY DATA SUCH AS THE REACTOR SAFETY STUDY. SUCH DATA ARE BEING USED IN RELIABILITY STUDIES THAT SUPPORT OR PROVIDE THE BASES FOR LICENSING REQUIREMENTS. DESCRIBE IMPACT OF RESULTS: THE FIRST STUDIES USING THIS DATA HAVE NOT YET BEEN COMPLETED AND THEREFORE THE IMPACT CANNOT YET BE DETERMINED.

COMMENTS/REMARKS: THIS DATA MANUAL PROVIDES THE STRUCTURE FOR INCORPORATING NEW OR REVISED DATA AS IT BECOMES AVAILABLE. THE MANUAL NOW CONTAINS UNDIFFERENTIATED HARD AND SOFT DATA WHICH IS A SERIOUS IMPEDIMENT TO THE APPLICATION OF THIS DATA. THEREFORE, CONTINUING WORK IS REQUIRED TO INCREASE THE CONTENT OF HARD DATA BY INCORPORATING THE DATA DEVELOPED THROUGH SUCH PROGRAMS AS NRPDS.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 12 DATE ISSUED: 6/16/77 RES. PROGRAM ELEMENT: RISK ASSESSMENT/PRIMARY SYSTEMS INTEGRITY

RIL TITLE: MODIFICATIONS TO PRESSURE VESSEL FAILURE PROBABILITY PREDICTION (OCTAVIA CODE)

SPONSORING OFFICE(S): RES PRG: NONE RESEARCH PROJECT MGR: M. VESELY

RES COMMENTS: MODIFICATIONS IN THE OCTAVIA COMPUTER CODE REPORTED IN RIL #10 WERE MADE. THESE MODIFICATIONS INCLUDE A CAPABILITY TO HANDLE RESIDUAL STRESS IN A REACTOR PRESSURE VESSEL WHICH CAN EITHER BE CONSTANT, OR VARY WITH FLAW SIZE; THE CODE USER CAN IMPOSE AN UPPER BOUND ON THE VESSEL TOUGHNESS AND THE CODE HAS THE CAPABILITY TO HANDLE UNCERTAINTIES IN THE TOUGHNESS. USING THE MODIFIED OCTAVIA CODE, THE MEDIAN FAILURE PROBABILITY FOR THE SURPY REACTOR PRESSURE VESSEL WAS CALCULATED TO BE 5 X 10-7 PER VESSEL YEAR FOR AN OPERATING TEMPERATURE OF 110 C AND THE CURRENT AGE OF APPROXIMATELY 2.5 YEARS. THE FAILURE PROBABILITY INCREASES TO 3 X 10-5 PER VESSEL YEAR AFTER 40 YEARS.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	
OFFICE RESPONSIBLE.....	NRR/SD	--	--	--	--	--	NRR
SCHEDULED COMPLETION DATE..	8/16/77	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	1977
ACTUAL COMPLETION DATE.....	9/23/77	--	--	--	--	--	1977

COMMENTS FROM NRR BY: D. EISENHUT ON: 9/23/77 -
 DESCRIBE APPLICATION TO REGULATORY PROCESS: (SEE RIL #10)
 DESCRIBE IMPACT OF RESULTS: (SEE RIL #10)
 COMMENTS/REMARKS: THIS IS A MODIFICATION OF RESULTS TRANSFERRED BY RIL #10, 02-25-77.

COMMENTS FROM SD BY: P. RANDALL ON: 02/21/78 - SEE COMMENTS FOR RIL #10.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 13 DATE ISSUED: 11/11/77 RES PROGRAM ELEMENT: PRIMARY SYSTEMS INTEGRITY

RIL TITLE: RESIDUAL STRESSES IN WELDS

SPONSORING OFFICE(S): RES RRG:#20-VESSEL INTEGRITY RESEARCH PROJECT MGR: E. K. LYNN

RES COMMENTS: A VERIFIED MODEL IS PRESENTED FOR PREDICTING RESIDUAL STRESSES RESULTING FROM THE WELDING OF PIPES, AND THE ESTIMATION OF RESIDUAL STRESSES RESULTING FROM WELD REPAIRS OF REACTOR PRESSURE VESSELS. THE MODEL CAN BE USED IN THE LICENSING PROCESS TO AID IN THE EVALUATION OF CRACKING THAT HAS OCCURRED IN GIRTH-BUTT WELDS IN PIPING. IT SHOULD ALSO PROVE TO BE USEFUL IN ANY SAFETY EVALUATION OF PROPOSED REPAIRS BY WELD BUILDUP IN THE CORNER REGIONS OF PRESSURE VESSEL NOZZLES AFTER CRACKS HAVE BEEN REMOVED, AND IN VESSEL WELD REPAIRS.

	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	
POST RIL ACTIVITIES	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	IMPLEMENTED
OFFICE RESPONSIBLE.....	NRR/SD	---	---	---	---	---	---
SCHEDULED COMPLETION DATE..	3/31/78	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED
ACTUAL COMPLETION DATE.....	2/21/78	---	---	---	---	---	---

COMMENTS FROM NRR BY: J. KNIGHT ON: N/A - NO RESPONSE RECEIVED

COMMENTS FROM SD BY: H. CORR ON: 02/21/78 -

THE WISDOM OF ESTIMATING RESIDUAL STRESS FROM PIPE MODELS IS QUESTIONED, PARTICULARLY WHEN 1/2 BEAD WELD REPAIR STUDIES ARE GOING ON IN PARALLEL AT ORNL.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL # 14 DATE ISSUED: 11/9/77 RES PROGRAM ELEMENT: SYSTEM ENGINEERING

RIL TITLE: PHYSICAL SEPARATION CRITERIA FOR ELECTRICAL CABLE TRAYS (HORIZONTAL OPEN SPACE CONFIGURATION)

SPONSORING OFFICE(S): RES RRG: 823-ELECTRICAL SIDS & FIRE PROTECTION RESEARCH PROJECT MGR: R. FEIT

RES COMMENTS: THE ADEQUACY OF THE REQUIRED SPACING OF ELECTRICAL CABLE TRAYS AT NUCLEAR POWER PLANTS WAS EXAMINED TO PREVENT THE SPREAD OF CABLE FIRES. RESULTS INDICATE THAT CURRENTLY USED CRITERIA FOR CABLE TRAY SEPARATION APPEAR TO BE ADEQUATE FOR ELECTRICALLY-INITIATED FIRES, BUT THAT CHANGES MAY BE REQUIRED FOR FIRES DUE TO EXTERNAL IGNITION SOURCES. THIS WORK IS APPLICABLE TO A VERIFICATION OF REGULATORY GUIDE 1.75, "PHYSICAL INDEPENDENCE OF ELECTRIC SYSTEMS". EXPOSURE FIRE TESTING EMPLOYING EXTERNAL FUEL SOURCES WAS CONDUCTED TO PROVIDE DATA FOR THE DEVELOPMENT OF CURRENT NRC STAFF POSITION AS DOCUMENTED IN THE APPENDIX A TO THE BRANCH TECHNICAL POSITION APCS 9.5-1, "GUIDELINES FOR FIRE PROTECTION FOR NUCLEAR POWER PLANTS" AND IN THE DRAFT REGULATORY GUIDE 1.120, "FIRE PROTECTION GUIDELINES FOR NUCLEAR POWER PLANTS."

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	AC'S	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE.. 1/9/78	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	--
ACTUAL COMPLETION DATE..... 04/26/78	NRR,SD	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE

COMMENTS FROM NRR BY: R. TEDESCHI ON: 04/26/78

DESCRIBE APPLICATION TO REGULATORY PROCESS: THE RIL PROVIDES RESULTS OF A COMPLETED PORTION OF THE NRC FIRE PROTECTION RESEARCH PROGRAM CONDUCTED AT THE SANDIA LABORATORIES REGARDING THE EFFECTS OF CABLE TRAY SEPARATION ON THE PROPAGATION OF ELECTRICALLY INITIATED AND EXPOSURE FIRES.

DESCRIBE IMPACT OF RESULTS: THE INTRODUCTORY PARAGRAPH OF RIL #14 STATES THAT THE RESULTS OF THE SANDIA PROGRAM INDICATE THAT "CURRENTLY USED CRITERIA FOR CABLE TRAY SEPARATION APPEAR TO BE ADEQUATE FOR ELECTRICALLY INITIATED FIRES BUT THAT CHANGES MAY BE REQUIRED FOR FIRES DUE TO EXTERNAL IGNITION SOURCES." THIS IS NOTED IN A CONVERSATION ON NOVEMBER 11, 1977 THAT THE SPECIFIC POINT RAISED IN THAT PARAGRAPH IS DIRECTED TO THE ADEQUACY OF SOLE RELIANCE ON THE SEPARATION CRITERIA OF REGULATORY GUIDE 1.75 FOR PROTECTION AGAINST EXPOSURE FIRES. THE FIRE PROTECTION CRITERIA DEVELOPED BY THE STAFF SINCE THE BROWNS FERRY FIRE HAVE RECOGNIZED THAT RELIANCE SHOULD NOT BE PLACED SOLELY ON THE SEPARATION CRITERIA OF REGULATORY GUIDE 1.75. OUR STAFF REPORTED DATED NOVEMBER 9, 1977 ON "THE QUESTION OF WHETHER THE PETITION OF THE UNION OF CONCERNED SCIENTISTS RAISES MATTERS THAT REQUIRE IMMEDIATE COMMISSION ACTION." INDICATES THE STAFF POSITION THAT THE IEEE-384 AND THE REGULATORY GUIDE 1.75 SEPARATELY SET GUIDELINES, AND THE IEEE-384 FIRE RETARDANCY STANDARDS FOR SAFETY CABLES, BY THEMSELVES ARE NOT SUFFICIENT TO PROTECT AGAINST EXPOSURE FIRES. CONSEQUENTLY WE REQUIRE ADDITIONAL MEASURES FOR FIRE PROTECTION SUCH AS: FIRE BARRIERS BETWEEN REDUNDANT DIVISION CABLE TRAYS; FIRE RETARDANT COATINGS ON CABLES; ALTERNATE FIRE DETECTION SYSTEMS; AUTOMATIC FIRE EXTINGUISHING SYSTEMS; ADMINISTRATIVE PROCEDURES; AND TRAINING PROGRAMS. THIS POSITION HAS BEEN HELD BY THE STAFF SINCE THE BROWNS FERRY FIRE AND IS REFLECTED IN OUR STANDARD REVIEW PLAN SECTION 9.5.1 (BRP 9.5-1), DATED MAY 1976, AND REVISION 1 TO THAT GUIDE ISSUED FOR COMMENT NOVEMBER 7, 1977. THUS, EXPOSURE FIRES ARE REQUIRED TO BE CONSIDERED IN THE FIRE PROTECTION PROGRAMS FOR BOTH OPERATING PLANTS AND PLANTS IN THE LICENSING PROCESS. IT SHOULD BE NOTED THAT THE RIL ACKNOWLEDGES THAT FURTHER TESTING WITH ELECTRICALLY INITIATED CABLE TRAY FIRES UNDER DIFFERENT CONDITIONS MAY RESULT IN FULLY DEVELOPED FIRES.

WE CONCLUDE, AS DOES RIL #14, THAT THESE RESEARCH RESULTS CONFIRM THE NEED FOR PROTECTION MEASURES IN ADDITION TO THE SEPARATION CRITERIA. SINCE SUCH MEASURES ARE INCLUDED IN OUR PRESENT CRITERIA WE CONCLUDE THAT THE INFORMATION IN RIL #14 DOES NOT INDICATE THE NEED FOR CHANGES IN OUR FIRE PROTECTION GUIDELINES, BUT THAT IT CONFIRMS THE NEED FOR OUR PLANS TO UPDATE REGULATORY GUIDE 1.75.

COMMENTS/REMARKS: NONE

COMMENTS FROM SD BY: D. SULLIVAN ON: N/A - NO RESPONSE RECEIVED

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #1 15 DATE ISSUED: 12/1/77 RES PROGRAM ELEMENT: PRIMARY SYSTEMS INTEGRITY
 RIL TITLE: CHARACTERIZATION OF BWR FEEDWATER NOZZLE CORNER CRACKS
 SPONSORING OFFICE(S): RES REG: #20-VESSEL INTEGRITY RESEARCH PROJECT MGR: E. K. LYNN

RES COMMENTS: PRESSURE LOADING OF CRACKS IN THE INSIDE CORNER OF FEEDWATER INTAKE NOZZLES FOR BAILING WATER REACTOR (BWR) PRESSURE VESSELS HAVE BEEN CHARACTERIZED. THE CHARACTERIZATION ESTABLISHED THE RELATIONSHIP BETWEEN STRESS-GENERATED PRESSURE AND MEASURABLE CRACK PARAMETERS, IN ORDER TO DETERMINE THE GROWTH OF THE CRACK AND ITS CRITICAL SIZE. THESE RESULTS CAN BE USED TO CHECK THE CALCULATIONS BASED ON INTERNAL PRESSURES FOR THE SAFETY ANALYSIS OF BWR FEEDWATER NOZZLE CORNER CRACKS DURING SUBSEQUENT COMBINED COOLING AND UNLOADING. IT HAS BEEN SHOWN THAT UNDER THE MOST SEVERE CONDITIONS, THE CRACK CAN PENETRATE NO MORE THAN 1/3 OF THE PRESSURE VESSEL WALL. THIS MEANS THAT THE VESSEL WILL ALWAYS BE CAPABLE OF RETAINING EMERGENCY COOLING WATER, THUS KEEPING THE CORE COAL AND PROVIDING FOR A SAFE SHUTDOWN. THUS, VESSEL FAILURE IS NOT POSSIBLE FOLLOWING WARM PRESTRESSING UNDER CONDITIONS WHERE COLD EMERGENCY CORE COOLING WATER IS INJECTED INTO THE HOT PRESSURE VESSEL FOLLOWING A LOSS OF COOLANT ACCIDENT.

POST-ALL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE..	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	
ACTUAL COMPLETION DATE.....	NR/50	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED
	3/31/78	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED
	2/21/78	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED	UNRECORDED

COMMENTS FROM NLR BY: D. EISENHUT ON: 2/21/78

DESCRIBE APPLICATION TO REGULATORY PROCESS: NLR CONCURS THAT THESE DATA CAN BE USED FOR PARTIAL VERIFICATION OF THE APPROXIMATE METHODS USED BY GE IN ESTIMATING THE STRESS INTENSITY FACTORS APPLICABLE TO FEEDWATER AND CRD NOZZLE CRACKS IN BWR REACTOR VESSELS. THEY CAN ALSO BE USED FOR VERIFICATION OF MORE SOPHISTICATED METHODS OF EVALUATION (SUCH AS FINITE ELEMENT ANALYSIS) IF AND WHEN SUCH METHODS ARE DEVELOPED.
 DESCRIBE IMPACT OF RESULTS: WE HAVE MADE A COMPARISON BETWEEN THE GE STRESS INTENSITY CURVE (FIG. 3-26 OF NRC-21400) FOR THE ONE CASE WHERE A DIRECT COMPARISON CAN BE MADE -- NAMELY, AT AN A/T RATIO SLIGHTLY GREATER THAN 0.50, AS PROVIDED BY FIG. 7 OF THE PROGRESS REPORT. FOR THIS ONE CASE, THERE IS ALMOST EXACT AGREEMENT BETWEEN THE GE CURVE AND THE VPI TEST RESULTS. THE GE CURVE, WHEN CONVERTED TO NORMALIZED STRESS INTENSITY FACTORS, WILL ALSO PRODUCE A CURVE AS A FUNCTION OF A/T RATIO WHICH IS QUALITATIVELY SIMILAR TO THAT OF FIG. 7 OF VPI REPORT VPI-E-76-25; IN THIS CASE, EXACT CORRESPONDENCE IS NOT TO BE EXPECTED BECAUSE OF THE MATERIAL DIFFERENCE IN THE DIAMETER-TO-THICKNESS RATIOS OF VESSELS INVOLVED. THE CLOSE AGREEMENT BETWEEN THE GE CURVE AND THE TEST RESULT FOR THE ONE CASE WHERE A VALID COMPARISON CAN BE MADE PROVIDES ASSURANCE THAT THE STRESS INTENSITY FACTORS USED BY GE IN THEIR EVALUATION ARE REASONABLE APPROXIMATIONS.
 COMMENTS/REMARKS: WE ENCOURAGE THE COMPLETION OF THIS WORK AND PARTICULARLY THE DEVELOPMENT OF VERIFIED ANALYTICAL METHODS WHICH WILL PROVIDE AN ASSURED MEANS FOR FUTURE CALCULATION OF SIF'S FOR CRACKS IN COMPLEX GEOMETRIES (SUCH AS THROUGH THE USE OF FINITE ELEMENT ANALYSIS).

COMMENTS FROM SD BY: E. RIVENDANT ON: N/A - NO RESPONSE RECEIVED

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 16

DATE ISSUED: 12/1/77

RES PROGRAM ELEMENT: PRIMARY SYSTEMS INTEGRITY

RIL TITLE: WARM PRESTRESSING

SPONSORING OFFICE(S): RES

RRS: #20-VESSEL INTEGRITY

RESEARCH PROJECT MGR: E. K. LYNN

RES COMMENTS: THE EFFECT OF COLD EMERGENCY CORE COOLING WATER ON HOT REACTOR PRESSURE VESSELS WAS CONSIDERED. THE RESULTING THERMAL SHOCK COULD, UNDER "WORST CASE" CONDITIONS, LEAD TO THE PREDICTION THAT FLAWS IN THE STEEL PRESSURE VESSEL WOULD EXTEND. RESULTS REPORTED HERE PROVIDE A VERIFICATION OF THE "WARM PRESTRESSING" EFFECT WHICH CAN PRECLUDE CRACK EXTENSION WHEN IT OTHERWISE WOULD HAVE BEEN PREDICTED. TO DESCRIBE THIS EFFECT, ONCE A CRACK IS LOADED WHILE THE MATERIAL IS VERY TOUGH, NO RAPID EXTENSION WILL OCCUR.

	USER OFFICE	DISCUSSION MEETING	POSITION PAPER	COMMISSION BRIEFING	ACPS BRIEFING	PRESS RELEASE	RESULTS IMPLEMENTED
POST RIL ACTIVITIES	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	
OFFICE RESPONSIBLE.....	NRP/SD	---	---	---	---	---	---
SCHEDULED COMPLETION DATE..	2/1/78	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED
ACTUAL COMPLETION DATE.....	2/14/78	---	---	---	---	---	---

COMMENTS FROM NRP BY: D. CISENHUT ON: 2/14/78 -

DESCRIBE APPLICATION TO REGULATORY PROCESS: IF "WARM PRESTRESSING" AS DESCRIBED IN THE RIL IS OPERATIVE ON HIGHLY IRRADIATED REACTOR VESSEL STEELS, THIS MECHANISM COULD PROVIDE ADDITIONAL MARGIN IN THE RPV TO ACCOMMODATE THERMAL SHOCK ASSOCIATED WITH ECCS INJECTION DURING A LARGE LOCA.

DESCRIBE IMPACT OF RESULTS: BY LIMITING CONCERNS REGARDING THERMAL SHOCK TO REACTOR VESSELS TO THOSE TRANSIENTS THAT INVOLVE REPRESSURIZATION OF THE VESSEL, VENDOR ANALYSES AND NRC EVALUATIONS WOULD BE SIMPLIFIED. IT WOULD ALSO PROVIDE AT LEAST A PARTIAL ANSWER TO THE QUESTIONS POSED IN REG. GUIDE 1.2, "THERMAL SHOCK TO REACTOR VESSEL."

COMMENTS/REMARKS: NRP HAS DISCUSSED THE TECHNICAL ASPECTS COVERED BY THIS RIL WITH RES PERSONNEL, AND HAVE SCHEDULED ADDITIONAL MEETINGS TO FURTHER DISCUSS TECHNICAL DETAILS. A DETAILED TECHNICAL EVALUATION OF THE RESEARCH DESCRIBED IN THE RIL AND THE NRP ASSESSMENT OF ITS RANGE OF APPLICABILITY WILL BE COMPLETED BY MAY 1, 1978.

COMMENTS FROM SD BY: C. RIVENBARK ON: N/A - NO RESPONSE RECEIVED

22

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 18 DATE ISSUED: 11/9/77 RES PROGRAM ELEMENT: RISK ASSESSMENT

RIL TITLE: FRANTIC COMPUTER CODE

SPONSORING OFFICE(S): RES REC: NONE RESEARCH PROJECT MGR: F. GOLDBERG

RES COMMENTS: THE FRANTIC COMPUTER CODE IS USED TO CALCULATE THE UNAVAILABILITY OF ANY SYSTEM MODEL. COMPREHENSIVE SURVEILLANCE TESTING EVALUATIONS FOR A SYSTEM ARE POSSIBLE WITH THE INCORPORATION OF TEST DOWNTIMES, TEST INEFFICIENCIES, AND TEST-CAUSED FAILURES IN THE ANALYSIS OF SYSTEM MODELS. THE FRANTIC CODE HAS POTENTIAL SIGNIFICANT APPLICATION IN EVALUATING TECHNICAL SPECIFICATIONS ON TESTING AND ALLOWED DOWNTIMES FOR REACTOR SAFETY SYSTEMS. THE EVALUATIONS CAN BE OF A GENERIC NATURE, OR CAN BE APPLIED TO SPECIFIC PLANT SYSTEMS IF APPLICABLE DATA ARE AVAILABLE.

	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	
POST RIL ACTIVITIES							
OFFICE RESPONSIBLE.....	NRR/50	--	--	--	--	--	NRR
SCHEDULED COMPLETION DATE..	1/9/78	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	2/1/78
ACTUAL COMPLETION DATE....	12/6/77	--	--	--	--	--	1/15/78

COMMENTS FROM NRR BY: D. EISENHUT ON: 12/6/77 --

DESCRIBE APPLICATION TO REGULATORY PROCESS: THE SUBJECT RIL ANNOUNCED THE AVAILABILITY OF THE FRANTIC COMPUTER CODE. THIS COMPUTER CODE IS RECOGNIZED BY NRR AS AN IMPORTANT TOOL TO QUANTIFY SYSTEM UNAVAILABILITIES. THE FRANTIC COMPUTER CODE IS BEING USED BY SCIENCE APPLICATIONS, INC. TO PERFORM SENSITIVITY STUDIES ON ALLOWABLE OUTAGE TIMES FOR ECCS COMPONENTS AS A PORTION OF THE EFFORT UNDER CONTRACT NO. NRC-03-07-059.

DESCRIBE IMPACT OF RESULTS: THE CONTRACT EFFORT HAS NOT BEEN COMPLETED SO THAT THE OVERALL IMPACT CANNOT BE DETERMINED AT THIS TIME. HOWEVER, THE AVAILABILITY OF THE FRANTIC COMPUTER CODE HAS EXPEDITED THE PERFORMANCE OF SENSITIVITY STUDIES.

COMMENTS/REMARKS: DOR EXPECTS TO UTILIZE THE FRANTIC COMPUTER CODE, EITHER DIRECTLY OR UNDER TECHNICAL ASSISTANCE CONTRACTS, TO QUANTIFY SYSTEM UNAVAILABILITIES ON SPECIFIC OPERATING PLANTS AS THE NEED ARISES. THE CALCULATIONAL RESULTS WILL AID IN DETERMINING APPROPRIATE LICENSING ACTION.

COMMENTS FROM SD BY: G. RIVENBARK ON: N/A -- NO RESPONSE RECEIVED

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL #: 19 DATE ISSUED: 1/31/78 RES. PROGRAM ELEMENT: RISK ASSESSMENT RESEARCH PROJECT MGR: J. PITMAN
 RIL TITLE: GO METHODOLOGY ASSESSMENT
 SPONSORING OFFICE(S): RES REG: NONE

RES COMMENTS: GO PROVIDES A METHOD FOR SYSTEM MODELING AND A COMPUTER CODE TO CALCULATE A PREDICTION OF SYSTEM RELIABILITY. THE STUDY DEMONSTRATES THAT THIS METHOD PROVIDES EQUIVALENT RESULTS TO THOSE OBTAINED FROM FAULT TREE ANALYSIS, WHICH WAS USED IN THE REACTOR SAFETY STUDY. THE MODEL RESEMBLES THE SYSTEM SCHEMATIC OR PIPING DIAGRAM WHICH REDUCES THE BURDEN OF MODELING ALL SYSTEM COMPONENTS. GO HAS A POTENTIAL SIGNIFICANT USE AS A MEANS OF DETERMINING SYSTEM RELIABILITY OR AS A DIVERSE METHOD FOR VERIFYING SYSTEM ANALYSIS PERFORMED USING FAULT TREE OR SIMILAR MODELING TECHNIQUES.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE	OFFICE REVIEW	MEETING HELD	PAPER COMPLETED	BRIEFING HELD	BRIEFING HELD	RELEASE ISSUED	IMPLEMENTED
OFFICE RESPONSIBLE..... NRR/SD							
	MMSS						
SCHEDULED COMPLETION DATE.. 3/31/78		UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED
ACTUAL COMPLETION DATE.....							

COMMENTS FROM NRR BY: L. RUBENSTEIN ON: N/A - NO RESPONSE RECEIVED.

COMMENTS FROM SD BY: G. RIVENBARY ON: N/A - NO RESPONSE RECEIVED

COMMENTS FROM MMSS BY: B. HATTEN ON: N/A - NO RESPONSE RECEIVED.

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL # 20 DATE ISSUED: 1/24/78 RES PROGRAM ELEMENT: SAFEGUARDS
 RIL TITLE: A STUDY OF PHYSICAL PROTECTION EQUIPMENT
 SPONSORING OFFICE(S): IAE RRG: #71-PHYSICAL PROT. EQUIP. RESEARCH PROJECT MGR: E. RICHARD

RES COMMENTS: THE PURPOSE OF THIS STUDY WAS TO PROVIDE THE NRC INSPECTOR, LICENSING REVIEWER AND FIELD EVALUATOR WITH NEW AND IMPROVED METHODS FOR EVALUATING PHYSICAL PROTECTION EQUIPMENT THAT IS IN USE OR PROPOSED FOR USE AT LICENSED NUCLEAR FACILITIES. THE FIVE MAJOR PRODUCTS OF THIS STUDY ARE:
 1. A CATALOG OF PHYSICAL PROTECTION EQUIPMENT.
 2. A GUIDE FOR EVALUATION OF PHYSICAL PROTECTION EQUIPMENT.
 3. A BOOK OF REFERENCE MATERIALS (RELEVANT TO THE EQUIPMENT CATALOG AND THE EVALUATION GUIDE).
 4. A SET OF GUIDELINES FOR DEVELOPING A METHODOLOGY TO MEASURE LEVELS OF EFFECTIVENESS FOR A FIXED-SITE PHYSICAL PROTECTION SYSTEM.
 5. A SUMMARY REPORT, INCLUDING RECOMMENDATIONS FOR FURTHER WORK.

ALL OF THE ABOVE PRODUCTS HAVE BEEN DISTRIBUTED TO THE VARIOUS NRC REGIONAL OFFICES ARE ARE PRESENTLY BEING USED BY INSPECTORS AS BASIC REFERENCE DOCUMENTS FOR EVALUATING PHYSICAL PROTECTION EQUIPMENT INSTALLED AT LICENSED NUCLEAR FACILITIES. DATA FROM THESE DOCUMENTS WERE ALSO USED IN THE DEVELOPMENT OF A NEW NRC REGULATORY GUIDE ON INTERIOR INTRUSION DETECTION ALARM SYSTEMS BY THE OFFICE OF STANDARDS DEVELOPMENT. OTHER FEDERAL AGENCIES HAVE REQUESTED THE RESULTS OF THIS STUDY AS A MEANINGFUL COMPENDIUM OF AVAILABLE PHYSICAL PROTECTION EQUIPMENT AND EVALUATION EQUIPMENT TECHNIQUES. THE RESULTS OF THIS STUDY WILL BE USED IN PHASE II OF THIS SAFEGUARDS RESEARCH PROGRAM AS A BASIS FOR EXPANDING AND IMPROVING THE DATA AVAILABLE TO NRC STAFF REGARDING THE CHARACTERISTICS AND EFFECTIVENESS OF COMBINATIONS OF PHYSICAL PROTECTION EQUIPMENT, AND THEIR ASSOCIATED ADMINISTRATIVE AND OPERATIONAL PROCEDURES. THE DIVISION OF DOCUMENT CONTROL HAS BEEN REQUESTED TO PRINT THESE REPORTS FOR DISTRIBUTION ONLY TO OTHER AGENCIES AND NRC STAFF.

POST-PIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE REVIEW	MEETING HELD	PAPER COMPLETED	BRIEFING HELD	BRIEFING HELD	RELEASE ISSUED	IMPLEMENTED
	NRR/NMSS/SD/IE	--	--	--	--	--	--
SCHEDULED COMPLETION DATE..	3/31/78	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED
ACTUAL COMPLETION DATE....	--	--	--	--	--	--	--

COMMENTS FROM IAE BY: E. SMITH ON: N/A - NO RESPONSE RECEIVED.

COMMENTS FROM SD BY: P. JONES ON: 02/22/78 -
 HAVE AND WILL USE DATA IN THESE REPORTS IN PREPARATION AND REVISION OF NUREG'S AND R.G.'S IN AREA OF SECURITY EQUIPMENT.

COMMENTS FROM NMSS BY: B. WATLER ON: N/A - NO RESPONSE RECEIVED

COMMENTS FROM NRR BY: L. RUBENSTEIN ON: N/A - NO RESPONSE RECEIVED

RIL # 21 DATE ISSUED: 3/24/78 RES PROGRAM ELEMENT: RISK ASSESSMENT

RIL TITLE: CRITICAL REVIEW OF SODIUM HYDROXIDE AEROSOL TOXICITY

SPONSORING OFFICE(S): RES REG: NONE RESEARCH PROJECT MGR: M. CULLINGFORD

RES COMMENTS: THIS WORK CONSISTED PRIMARILY OF A REVIEW OF RELEVANT LITERATURE (WITH SOME PRELIMINARY SUPPORTIVE ANALYSIS) PERTAINING TO THE TOXICITY OF SODIUM HYDROXIDE (NAOH). ONE INSIGHT HAS BEEN THAT SODIUM IN THE HYDROXIDE (FOUN, FOLLOWING AN INCIDENT INVOLVING SODIUM RELEASE, MAY NOT EXIST IN SUFFICIENT AMOUNTS TO WARRANT FURTHER ATTENTION. IN ADDITION, THE CHEMICAL SPECIES THAT WOULD BE PRESENT IN APPRECIABLE QUANTITIES (NA2CO3) MAY NOT BE OF CONCERN IN TERMS OF HEALTH EFFECTS.

THE PRINCIPAL FINDINGS WHICH SUBSTANTIATE THE ABOVE INSIGHTS ARE:

(A) FOR RELATIVE HUMIDITIES EXCEEDING 35%, IT APPEARS THAT NAOH DROPLETS IN THE ATMOSPHERE WILL BE TRANSFORMED TO SODIUM CARBONATE DECAHYDRATE IN LESS THAN A MINUTE IF THE NAOH AEROSOL CONCENTRATION IS LESS THAN OR EQUAL TO ABOUT 100 NG/M3. THIS TRANSFORMATION WILL TAKE LONGER IF THE RELATIVE HUMIDITY IS LESS THAN 35%.

(B) THE ALKALINITY OF A SODIUM CARBONATE SOLUTION WILL BE SUBSTANTIALLY LESS THAN THAT OF A SODIUM HYDROXIDE SOLUTION OF THE SAME NORMALITY; THUS, CARBONATE AEROSOLS WILL BE LESS HAZARDOUS, PER SODIUM ATOM, THAN HYDROXIDE AEROSOLS.

(C) THE TRANSFORMATION FROM THE SODIUM HYDROXIDE TO SODIUM CARBONATE DECAHYDRATE INCREASES THE AERODYNAMIC DIAMETER OF THE AEROSOL BY APPROXIMATELY 40%. THIS INCREASE IN DIAMETER SHIFTS SOME OF THE AEROSOL OUT OF THE RESPIRABLE RANGE AND THUS LOWERS THE RESPIRABLE FRACTION OF THE AEROSOL. HYDROXIDE OR CARBONATE PARTICLES ENTERING THE UPPER RESPIRATORY TRACT WILL ABSORB WATER AND GROW SO THE RESPIRABLE FRACTION WILL DECREASE.

POST RIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	BRIEFING	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE	MEETING	PAPER	DRAFTING	HELD	HELD	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE.. 5/29/78	REVIEW	HELD	COMPLETED	HELD	HELD	HELD	ISSUED	---
ACTUAL COMPLETION DATE.....	NRR	UNCOMPLETED	UNCOMPLETED	UNCOMPLETED	UNCOMPLETED	UNCOMPLETED	UNCOMPLETED	UNCOMPLETED

COMMENTS FROM NRR BY: L. RUBINSTEIN ON: N/A - RESPONSE DUE 5/24/78

PROGRAM OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RIL # 23 DATE ISSUED: 3/21/78 RES PROGRAM ELEMENT: FUEL BEHAVIOR

RIL TITLE: "EASI" ADVERSARY SEQUENCE EVALUATION MODEL (COMPUTER GRAPHICS VERSION)

SPONSORING OFFICE(S): NMSS PRG: 41-SAFEGUARDS RESEARCH RESEARCH PROJECT MGR: R. ROBINSON
REVIEW GRP

RES COMMENTS: RESEARCH HAS BEEN COMPLETED ON DEVELOPING A GRAPHICS DISPLAY VERSION OF A COMPUTER MODEL CALLED ESTIMATE OF ADVERSARY SEQUENCE INTERRUPTION (EASI), AND RESPONDS TO AN EXPRESSED NEED FOR EVALUATIVE METHODS FOR FIXED-SITE THEFT AND SABOTAGE PREVENTION SYSTEMS. DOCUMENTATION HAS ALREADY BEEN MADE AVAILABLE THROUGHOUT NRC CONCERNING PROGRAMMABLE POCKET CALCULATOR VERSIONS OF THE EASI MODEL.

THE OBJECTIVE OF THE "EASI" METHOD IS TO PROVIDE A USABLE EVALUATION METHOD WHICH CAN SERVE AS EITHER A PHYSICAL PROTECTION SYSTEM DESIGN AID OR AS A DECISION AID IN THE LICENSING AND INSPECTION PROCESS. THE EAS. GRAPHICS PROGRAM ALLOWS THE USER TO INPUT FACILITY AND ADVERSARY PATH ATTRIBUTES AT A COMPUTER GRAPHICS TERMINAL, AND OBTAIN AS OUTPUT A CRT "PERSPECTIVE VIEW" LINE PLOT. THE METHOD CAN TREAT BOTH THEFT AND SABOTAGE OBJECTIVES BY THREATS OF INSIDERS, OUTSIDERS, AND COMBINATIONS OF EACH GROUP.

THE RESULTS OF THE EASI ANALYSIS ARE EXPRESSED IN TERMS OF THE PROBABILITY THAT THE PHYSICAL PROTECTION SYSTEM CAN RESPOND IN TIME TO INTERRUPT AN ADVERSARY ALONG A PHYSICAL PATH (ACTION SEQUENCE). TO SUPPLEMENT THE EASI CALCULATIONS, EASI GRAPHICS PROVIDES THE ANALYST WITH A SELECTION OF SIX TWO-DIMENSIONAL AND EIGHT THREE-DIMENSIONAL PLOTS. THESE PLOTS ALLOW THE USER TO EXAMINE THE SENSITIVITIES OF VARIOUS COMPONENTS ALONG THE ADVERSARY'S PATH AND TO STUDY THE EFFECT ON THE PROBABILITY OF INTERRUPTION OF VARYING THE PERFORMANCE OF THESE COMPONENTS.

IT IS RECOMMENDED THAT THE EASI METHOD BE USED BY NMSS AND OTHER OFFICES AS AN ANCILLARY AID IN DEVELOPING PERFORMANCE-ORIENTED REGULATIONS OR IN CARRYING OUT A COMPREHENSIVE EVALUATION PROGRAM.

POST PIL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE.....	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE.. 6/10/78	PLIVER	HELD	COMPLETED	HELD	HELD	ISSUED	---
ACTUAL COMPLETION DATE.....	NMSS	---	---	---	---	UNSCHE	UNSCHE

COMMENTS FROM NMSS BY: B. HATTER ON: N/A - RESPONSE DUE 6/10/78

QTL #: 24 DATE ISSUED: 6/10/78 RES. PROGRAM ELEMENT: SAFEGUARDS

FILE TITLE: "FESEM" ADVERSARY SEQUENCE EVALUATION MODEL

SPONSORING OFFICE(S): NMSS
 REG: 41-SAFEGUARDS RESEARCH
 REVIEW GROUP
 RESEARCH PROJECT MSR: R. ROBINSON

RES COMMENTS: RESEARCH HAS BEEN COMPLETED ON THE FORCIBLE ENTRY SAFEGUARDS EFFECTIVENESS MODEL (FESEM). IN RESPONSE TO A NEED FOR EVALUATIVE METHODS FOR FIXED-SITE THEFT AND SABOTAGE PREVENTION SYSTEMS.

THE PURPOSE OF THIS STUDY WAS TO DEVELOP A METHODOLOGY FOR ANALYZING FIXED-SITE SECURITY SYSTEMS AS TO THEIR EFFECTIVENESS AGAINST A FORCIBLE ATTACK BY AN ADVERSARY INTENT ON CREATING AN ACT OF SABOTAGE OR THEFT. THE MODEL PROVIDES A FRAMEWORK FOR PERFORMING INEXPENSIVE EXPERIMENTS RELATED TO FIXED-SITE SECURITY SYSTEMS, FOR TESTING ALTERNATIVE DECISIONS, AND FOR DETERMINING THE RELATIVE COST EFFECTIVENESS ASSOCIATED WITH THESE DECISION POLICIES.

THE RESULTS OF THE FESEM ANALYSIS INCLUDE ESTIMATES OF THE PROBABILITY OF SABOTAGE OR THEFT WINS (AND LOSSES) BASED ON ATTACK FORCE SIZE, ATTACK MOBILITY, AND TYPE OF ATTACK; COLLECTED STATISTICS ASSOCIATED WITH EACH VARIABLE (E.G., NUMBER OF WINS BY DEFENDERS AND BY ATTACKERS FOR SUCCESSFUL SABOTAGE OR THEFT, ALARM TYPES FOR ALL RUNS, TIME REQUIRED FOR SUCCESSFUL SABOTAGE OR COMPLETION OF THEFT, ETC.).

THE PROGRAM IS CURRENTLY AVAILABLE FOR NRC USE VIA AN ACCESS CODE NUMBER TO SANDIA'S COMPUTER. A TRAINING PROGRAM WAS GIVEN IN FEBRUARY 1977 TO INTERESTED NRC PERSONNEL AND POTENTIAL USERS.

IT IS RECOMMENDED THAT THE FESEM MODEL BE USED BY NMSS AND OTHER OFFICES AS AN ANCILLARY AID IN FORMULATING REGULATORY REQUIREMENTS, LICENSING, INSPECTION AND OTHER MONITORING OPERATIONS.

POST	USER	DISCUSSION MEETING HELD	POSITION PAPER COMPLETED	COMMISSION BRIEFING HELD	ACRS BRIEFING HELD	PRESS RELEASE ISSUED	RESULTS IMPLEMENTED
OFFICE RESPONSIBLE	HMSS	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED	UNSCHED
SCHEDULED COMPLETION DATE	6/18/78						
ACTUAL COMPLETION DATE							

COMMENTS FROM NMSS BY: B. HATTEB ON: N/A - RESPONSE DUE 6/10/78

PROGRAM 4 OFFICE COMMENTS ON POTENTIAL UTILIZATION OR VALUE OF RESEARCH RESULTS IN THE REGULATORY PROCESS

RLL # 25 DATE ISSUED: 3/21/78 RES PROGRAM ELEMENT: SAFEGUARDS

RLL TITLE: FRAP-53

SPONSORING OFFICE(S): NMSS

PRG: #12-FUEL BEHAVIOR

RESEARCH PROJECT MGR: G. MARINO

RES COMMENTS: FRAP-53 IS A BEST-ESTIMATE COMPUTER CODE THAT CALCULATES THE THERMAL AND MECHANICAL RESPONSE CHARACTERISTICS OF A NUCLEAR FUEL ROD OPERATING UNDER STEADY-STATE POWER CONDITIONS, AND WAS DEVELOPED TO PROVIDE ACCURATE INITIAL VALUES OF FUEL-ROD PARAMETERS FOR INPUT INTO TRANSIENT ANALYSIS CODES SUCH AS FRAP-T AND RELAP. IT IS CAPABLE OF SUPPLYING THE HOT-STATE VALUES OF SUCH QUANTITIES AS:

1. STORED ENERGY
2. RADIAL TEMPERATURE DISTRIBUTIONS AT GIVEN AXIAL LOCATIONS
3. TOTAL FISSION GAS RELEASE
4. ROD INTERNAL GAS PRESSURE AND COMPOSITION
5. CLAD DEFORMATION
6. AMOUNT OF PELLET-CLAD INTERACTION (PCI)
7. FUEL DEFORMATION (SWELLING, DENSIFICATION, RELOCATION, AND THERMAL EXPANSION)
8. FUEL-CLAD GAP SIZE AND GAP CONDUCTANCE
9. CLAD-CORROSION AND HYDRIDING.

ALL OF THESE QUANTITIES ARE STRONGLY DEPENDENT UPON THE OPERATING HISTORY OF THE ROD, AND EACH WILL HAVE A LARGE EFFECT ON THE PREDICTED AND MEASURED RESPONSE OF A FUEL ROD DURING A TRANSIENT. THE CODE, THEREFORE, HAS BEEN DESIGNED TO PROVIDE THESE AND OTHER QUANTITIES FOR ANY GIVEN POWER HISTORY AS INITIAL CONDITIONS TO THE TRANSIENT CODES.

THE VERIFICATION OF THE FRAP-53 CODE HAD TWO MAJOR OBJECTIVES: (1) TO DETERMINE THE CODE PERFORMANCE IN PREDICTING THE AVAILABLE, QUALIFIED, EXPERIMENTAL DATA, AND (2) TO IDENTIFY THOSE AREAS THAT REQUIRE MORE SOPHISTICATED MODELING OR MORE EXPERIMENTAL DATA. THE CODE PERFORMANCE AND DATA WERE ANALYZED USING STATISTICAL METHODS. THUS, ALL OF THE MAJOR RESPONSE VARIABLES ARE PRESENTED ALONG WITH THEIR CORRESPONDING STANDARD ERROR BOUNDS. THE VERIFICATION PROCEDURE USED INFORMATION FROM OVER 700 FUEL RODS CONTAINING A WIDE RANGE OF OPERATING AND DESIGN PARAMETERS

POST RLL ACTIVITIES	USER	DISCUSSION	POSITION	COMMISSION	ACRS	PRESS	RESULTS
OFFICE RESPONSIBLE	OFFICE	MEETING	PAPER	BRIEFING	BRIEFING	RELEASE	IMPLEMENTED
SCHEDULED COMPLETION DATE	REVIEW	HELD	COMPLETED	HELD	HELD	ISSUED	--
ACTUAL COMPLETION DATE	NRP/SD	UNSCHE	UNSCHE	UNSCHE	UNSCHE	UNSCHE	--
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COMMENTS FROM NRP BY: L. RUBENSTEIN ON: N/A - RESPONSE DUE 5/21/78
COMMENTS FROM SD BY: B. HATLER ON N/A - RESPONSE DUE 5/21/78

3. PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (TARGET DATES ARE FISCAL YEARS)

TEMP. NUMB.	SUBJECT/TITLE/IMPACT	TARGET DATE	PRG. # AND NAME	PRG. CHAIRMAN
T133	PROCEDURES FOR DETERMINING CYCLIC TRIAXIAL STRENGTH OF SANDS AND CLAY. SUPPORTS LICENSING REVIEW.	QTR 3, 78	54-GEOLOGY & SEISMIC CHAR.	J. HARBOUR
T137	RELAP 4 MOD 6. EX-ANDC CES. ESTIMATE ANALYSIS OF BUR LOCA INTO THE CEFLOOD.	QTR 3, 78	14-REFERENCE SYSTEM CODE	S. FABIC
T129	VERIFY FRAP T3. PROVIDES R-R WITH ABILITY TO ANALYZE FUEL BEHAVIOR DURING REACTOR VARIATIONS FROM NORMAL OPERATIONS.	QTR 3, 8	12-FUEL BEHAVIOR	W. V. JOHNSTON
T140	UNIRRADIATED CRACK ARREST. ADDS CONFIDENCE TO LOWER BOUND KIR CURVE.	QTR 3, 78	30-VESSEL INTEGRITY	E. K. LYNCH
T141	REACON MOD 2. PROVIDES NRR WITH A BEST ESTIMATE ANALYSIS CAPABILITY TO INVESTIGATE INITIAL LOADS ON CONTAINMENT COMPARTMENTS AND LONG TERM LOADS AFTER LOCA.	QTR 3, 78	15-CONTAINMENT CODE	S. FABIC
T135	MARC STRUCTURAL ANALYSIS PROGRAMS. INSTRUCTIONS ON THE CAPABILITIES AND USE OF THE MARC PROGRAM HAS BEEN AND WILL AGAIN BE PRESENTED IN A 5 DAY COURSE TAUGHT BY THE MARC ANALYSIS CORP. STAFF.	QTR 3, 78	71-STRUCTURAL ANALYSIS TRANSPORTATION SAFETY	W. LAHS
T146	SUPER SYSTEM CODE (LOOP). PERMITS INDEPENDENT ANALYSIS OF SYSTEMS TRANSIENTS.	QTR 3, 78	32-SYSTEMS CODES & ACCIDENT ANALYSIS	P. M. WOOD
T149	RELEASE BRENDA. PROVIDES A QUICK RUNNING INDEPENDENT ANALYSIS OF SYSTEM TRANSIENTS.	QTR 3, 78	32-SYSTEMS CODES & ACCIDENT ANALYSIS	P. M. WOOD
T131	MELT CONCRETE INTERACTION - HELPS REDUCE UNCERTAINTIES IN RISK ASSESSMENT ANALYSES.	QTR 3, 78	NONE	R. DISALVO
T135	SENSITIVITY TESTS OF AERIAL PHOTOGRAPHIC TECHNIQUES. DETERMINE THE EFFECTIVENESS OF REMOTE SENSING TECHNIQUES FOR DETECTING VEGETATIVE STRESS IN THE VICINITY OF OVERLAPPING SALT WATER COOLING TOWERS. ESTABLISH SENSITIVITY BY CORRELATING THE RESULTS OF AERIAL PHOTOGRAPHY WITH GROUND BASED MONITORING PROGRAMS AND WITH THE PREDICTIONS OF DRIFT DISPERSION MODELS. DEVELOP & RECOMMEND APPLIED REMOTE SENSING PROGRAMS THAT COULD BE USED ROUTINELY TO REPLACE ALL OR PART OF THE FIELD SURVEYS CURRENTLY BEING USED TO MONITOR VEGETATIVE STRESS AROUND COOLING TOWERS.	QTR 3, 78	72-AERIAL REMOTE SENSING TECH.	D. BARNA

PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (CONTINUED)

TEMP. NUMBER	SUBJECT/TITLE/IMPACT	TARGET DATE	PRG. # AND NAME	PRG. CHAIRMAN
1143	INFORMATION REPORT ON THE SAFETY ANALYSIS OF THE PU AIR TRANSPORTABLE CONTAINER. THIS REPORT WILL PROVIDE A COMPENDIUM OF ALL ANALYSIS AND TESTING PERFORMED TO SUPPORT IN HRC SAR ON THE PWT CONTAINER. INFORMATION FROM THE DRAFT OF THIS REPORT WILL BE CURRENTLY BEING USED AS THE BASIS FOR THE HRC SAR. STRUCTURAL, HEAT TRANSFER, CONTAINMENT, SHIELDING, CRITICALITY, OPERATING PROCEDURES, ACCEPTANCE & MAINTENANCE, AND QUALITY CONTROL INCLUDING A COMPLETE SET OF DRAWINGS AND SPECIFICATIONS) SECTIONS ARE INCLUDED.	QTR 3, 78	NONE	W. LAHS
1122	EMERGENCY PLANNING	QTR 4, 78	31-EMERGENCY PLANNING	R. BLOND
1140	ASSESSMENT OF AGRICULTURAL LAND IN	QTR 4, 78	75-SOCIOECONOMIC IMPACTS	D. BARNA
1146	INSTITUTIONAL RADWASTE CHARACTERIZATIONS. RIT WILL BE A REPORT WHICH WILL PRESENT DATA ON SOURCE CHARACTERISTICS AND VOLUMES OF LOW LEVEL WASTE GENERATED IN THE MEDICAL ACADEMIC USES OF RADIOISOTOPES. DATA WILL BE USED IN ESTABLISHING STANDARDS FOR PACKAGING AND DISPOSAL OF LOW LEVEL WASTES.	QTR 4, 78	NONE	C. BARTLETT
1119	PRELIMINARY REPORT ON WASTE MANAGEMENT RISK ASSESSMENT METHODOLOGY DEVELOPMENT	QTR 4, 78	40-HIGH LEVEL WASTE DISPOSAL	M. C. COLLINGSFORD
1154	SODIUM GUIDE AEROSOL PROPERTY MEASUREMENTS. REASSESSMENT OF AEROSOL RELATED MARGINS IN EVALUATION MODEL FOR SITING.	QTR 4, 78	45-AEROSOL RELEASE & TRANSPORT	J. LARKIN
1135	EVALUATION OF GENERAL ATOMIC CODES. PROVIDES LICENSING WITH BETTER BASIS FOR RESPONSE TO GPC EVALUATIONS OF FORT ST. VRAIN (FSV).	QTR 4, 78	38-GCR ACCIDENT DELINEATION AND ANALYSIS	B. SCHAMBERBER
1136	SIMMER-II RELEASED. REASSESSMENT OF WORK ENERGY TO BE ACCOMMODATED IN NDC.	QTR 4, 78	68-SIMMER CODE	R. LORTIS
1152	PROMPT BURST ENERGY & FUEL EQUATION-OF-STATE. ANALYSIS OF MCDA DAMAGE POTENTIAL LOCAL-ECOS THERMAL SHOCK ANALYSIS OF THIS ACCIDENT CLASS INCLUDING EFFECTS OF WRM PRESCREENING.	QTR 4, 78	29-THERMAL-MECHANICAL	R. W. WRIGHT E. K. LYNN
1139	LAND USE AND LAND VALUE CHANGES OVER TIME AT NUCLEAR PLANTS. EXAMINE & DOCUMENT THE SHIFTS IN LAND USE THAT TOOK PLACE OVER TIME. FROM PRE-INSTALLATION TO THE PRESENT, IN THE VICINITY OF THREE NUCLEAR ELECTRIC GENERATING PLANTS. DETERMINE.	QTR 1, 79	75-SOCIOECONOMIC IMPACTS	D. BARNA

TEMP. CODE	SUBJECT/TITLE/IMPACT	TARGET DATE	REQ. # AND NAME	PRG. CHAIRMAN
740	REVISION OF NUCLEAR SAFETY GUIDE TID 7016. THE NUCLEAR SAFETY GUIDE PRESENTS DATA AND METHODS FOR EVALUATION OF NUCLEAR CRITICALITY FOR A WIDE RANGE OF SYSTEM GEOMETRIES AND MATERIALS. THE SECOND EDITION INCORPORATES MORE RECENT DATA SOURCES AND IMPROVED ANALYSIS METHODS ALLOWING FOR WIDER APPLICATION THAN IN PREVIOUS EDITIONS.	QTR 4, 79	NONE	D. SOLB'RG
742	CORRA-OF-ANALYSIS. PROVIDES NRP WITH INDEPENDENT EVALUATION OF UMI PERFORMANCE DATA.	QTR 1, 79	16-ADVANCED SYSTEM CODE	S. FABIC
748	BUILD-MAKE DIFFUSION MODELS. COMPARES QTR 1, 79 FIELD AND KIND TUNNEL MODELS TO VALIDATE LICENSING DATA BASE.	QTR 1, 79	62-LMP RISK ASSESSMENT	J. MURPHY
751	FISSION GAS RELEASE MODEL VERIFIED. ADDS TRANSIENT FISSION GAS RELEASE QUANTIFICATION TO FRAP-T ENHANCING A-IDENT CALCULATIONS.	QTR 1, 79	5-FISSION PRODUCT RELEASE	P. DISALVO
754	INITIAL IN-PILE CORE MELT RETENTION TESTS.	QTR 1, 79	27-POST ACCIDENT HEAT REMOVAL	R. M. WEIGHT
758	GENERIC REVIEW OF THE IMPACT OF CONSERVATION, RATE STRUCTURE & LOAD MANAGEMENT ALTERNATIVES ON THE NEED FOR POWER. PREPARE A REFERENCE DOCUMENT WHICH REVIEWS & SYNTHESIZES RECENT EVIDENCE & EVALUATES FUTURE PROSPECTS REGARDING THE IMPACT OF ALTERNATIVE ENERGY CONSERVATION PROGRAMS, RATE STRUCTURE DESIGN, LOAD MANAGEMENT STRATEGIES, AND CO-GENERATION SYSTEMS ON THE NEED FOR POWER.	QTR 1, 79	75-SOCIOECONOMIC IMPACTS	D. BARWA

PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (CONTINUED)

TEMP. NUMB.	SUBJECT/TITLE/IMPACT	TARGET DATE	PRG. # AND NAME	PRG. CHAIRMAN
T53	URANIUM OXIDE AEROSOL TESTS (INSPP). RE-ASSESSMENT OF AEROSOL TRANSPORT RELATED MARGINS IN EVALUATION MODEL FOR SITING.	QTR 1, 79	25-AEROSOL RELEASE & TRANSPORT	M. SILBERBERG
T78	CABLE COATING MATERIAL TESTS. CONFIRMS DESIGNS IN CURRENT V OPERATING PLANTS AND PORTIONS OF REG OP DE 1.129.	QTR 1, 79	23 FIRE PROTECTION	R. FEIT
T74	RADIATION (SOURCE TERM) SIMULATOR TESTS. CONFIRMS PORTIONS OF REG GUIDE 1.89.	QTR 1, 79	77-QUALIFICATION, TESTING, EVALUATION	R. FEIT
T72	VALIDATION OF SIMMER NEUTRONICS. PERMITS GREATER CONFIDENCE IN MARGIN AVAILABLE IN MCDA ANALYSIS.	QTR 1, 79.	33-CRITICAL EXPERIMENTS	P. M. WOOD
T128	WRAP IN/OUT - INCORPORATES INTEGRATED AND AUTOMATED IMPROVEMENTS INTO A LICENSING CODE PACKAGE.	QTR 1, 79	NONE	NONE
T126	IF APPLICATION OF WASH-1400 METHODOLOGY	EARLY 79	62-LWR RISK ASSESSMENT	J. PITTMAN
T125	CORE MELTDOWN SENSITIVITY STUDY	QTR 2, 79	62-LWR RISK ASSESSMENT	M. CUNNINGHAM
T118	CONSEQUENCE MODEL (INDIVIDUAL SITE ASSESSMENT, FINAL MODEL UPDATE, CRAC USER'S MANUAL, AND COMPARISON TO SAFETY REVIEW METHODS IN 10 CFR 100)	QTR 2, 79	39-CONSEQUENCE MODELING	R. BLOD
T39	LOW FLOW RATE CORRELATION. MAY REMOVE THE CURRENT RESTRICTION IN APPENDIX K OF STEAM COOLING BELOW 1 INCH/SIC AND REPLACE WITH CORRELATION.	QTR 2, 79	5-REFLOOD HEAT TRANSFER	E. R. DAVIDSON
T52	PHYSICAL SEPARATION CRITERIA (HORIZ. CLOSED SPACE). CONFIRMS PORTIONS OF REG. GUIDE 1.75.	-QTR 2, 79	23-ELECTRICAL SYS & FIRE PROT.	R. FEIT
T60	FIELD VALIDATE ELECTROCHEMICAL TEST. UPDATES REG. GUIDE TO PRECLUDE SENSITIZED STAINLESS STEEL IN SERVICES.	QTR 2, 79	22-CORROSION	J. MUSCARA
T69	CODE RECOMMENDATIONS FOR MULTIPLE INTER-ACTING NOZZLES. PROVIDES NEW DESIGN RULES FOR SUCH AS SAFETY INJECTION NOZZLES.	QTR 2, 79	20-VESSEL INTEGRITY	E. R. LYNN

TEMP. NUM.	SUBJECT/TITLE/IMPACT	TARGET DATE	RFS. # AND NAME	RFC CHAIRMAN
1136	ENVIRONMENTAL IODINE SPECIES BEHAVIOR. STUDY THE PHYSICAL & BIOLOGICAL TRANSPORT OF CHEMICAL FORMS TO RADIOIODINES RELEASED TO THE ENVIRONMENT FROM AN OPERATING NUCLEAR STATION. DETERMINE THE INFLUENCE OF WET DEPOSITION (RAIN OR DEW) FOR METEOROLOGICAL MODELS & THE IODINE-AIR-GRASS-MILK PATHWAYS. PERFORM LABORATORY TESTS TO DETERMINE IF METHYLOIDE IS DEPOSITED ON GRASS UNDER WET DEPOSITION CONDITIONS. DETERMIN ENVIRONMENTAL PATHWAYS OF TRITIUM AND CARBON-14 RELEASED FROM NUCLEAR STATIONS.	QTR 2, 79	43-AQUATIC TRANSPORT & FATE	P. R. REED
1137	MONITORING OF RADIOIODINE FROM CONTAMINANT ACCIDENTS. TO DETERMINE THE PRACTICALITY OF USING AVAILABLE CIVIL DEFENSE INSTRUMENTS TO ASSESS PUBLIC HEALTH IMPACTS OF AN ACCIDENTAL RELEASE OF RADIOIODINE FROM NUCLEAR STATIONS. TO ASSESS INSTRUMENTATION CAPABILITIES (PARTICLE COLLECTION EFFICIENCY, PARTICULATE CONTRIBUTIONS, AND INSTRUMENT RELIABILITY) BY EVALUATING A PORTABLE FIELD RADIOIODINE COLLECTION SYSTEM AND A DETECTION SYSTEM USING A CUV-700 GM SURVEY INSTRUMENT.	QTR 2, 79	74-TERRESTRIAL RADIOECOLOG	P. R. REED
1147	REACTOR WASTEWATER. YOUR REPORTS WILL SUMMARIZE 3 YRS. OPERATING EXPERIENCE IN USE OF EVAPORATION, FILTRATION AND ION EXCHANGE EQUIPMENT AND SOLID WASTE MANAGEMENT SYSTEMS IN NUCLEAR POWER PLANTS. DATA WILL BE USED IN LICENSING EVALUATIONS OF APPLICANTS' EFFLUENT CONTROL SYSTEMS DESIGNS.	QTR 2, 79	NONE	D. SOLBERG
1127	LIQUID PATH	QTR 2, 79	62-LWR RISK ASSESSMENT	J. MURPHY
1147	REVIEW CORRELATION. MAY REMOVE APPENDIX K. DISTRIBUTIONS BY RETURN OF NUCLEATE ROLLING WITH A CORRELATION.	QTR 2, 79	3-PWR-BDHT 4-BWR-BDHT	E. M. DAVIDSON E. H. DAVIDSON
1147	ASSESSMENT OF SOURCES OF DOCUMENTATIONAL RADIATION EXPOSURE AT NUCLEAR POWER PLANTS. IDENTIFY EXPOSURE REDUCTION TECHNIQUES AND RECOMMEND DESIGN FEATURES TO KEEP OCCUPATIONAL EXPOSURES AS LOW AS REASONABLY ACHIEVABLE. TO BE USED IN ASSESSING THE EFFECTIVENESS OF REGULATORY	QTR 2, 79	76-OCCUPATIONAL EXPOSURES AND PROTECTION	J. FOULKE

PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (CONTINUED)

TEMP. NOTE	SUBJECT/TITLE/IMPACT	TARGET DATE	REG. # AND NAME	REG. CHAIRMAN
T02	TRANSIENT CHF CORRELATION, NO CHANGE IN APPENDIX K BUT MAY REPLACE CURRENT CORRELATION.	QTR 3, 79	3-PWR-BDHT 4-PWR-BDHT	E. H. DAVIDSON E. H. DAVIDSON
T40	LWR LOCA TRIC RELEASED. PROVIDES NRR WITH ADVANCED BUR AND PWR COOLANT SYSTEMS CODE TO ESTABLISH MARGINS OF SAFETY.	QTR 3, 79	14-ADVANCED SYSTEM CODE	N. ZUBER
T43	VERIFY RALAP 4 MOD 4. VERIFIES PWR BEST ESTIMATE ANALYSIS THRU REFLOOD.	QTR 3, 79	17-VERIFICATION	L. S. TONG
T70	HYDROELASTIC EFFECTS STUDIES. FOR PSS (PRESSURE SUPPRESSION SYSTEMS) CONTAINMENTS	QTR 3, 79	15-CONTAINMENT CODE	S. FABIC
T79	MECHANICAL PROPERTIES REPORT. PROVIDES INDEPENDENTLY VERIFIED IRRADIATED ZIRCALOY DATA FOR USE IN LICENSING CALCULATIONS.	QTR 3, 79	8-ZIRCALOY CLADDING	M. L. PICKLESIMER
T84	SOURCE TERM CORRELATION. CONFIRMS CONSERVATISM OF REL. GUIDE ASSUMPTIONS FOR ACCIDENT ANALYSIS.	QTR 3, 79	13-FUEL MELT	R. DISALVO
T100	VERIFY FRAPCON - PROVIDES NRR WITH DE AND EM CAPABILITY TO ANALYZE STEADY STATE FUEL BEHAVIOR.	QTR 3, 79	12-FUEL BEHAVIOR	M. V. JOHNSTON
T132	PROGRAM OUTLINE FOR HUMAN FACTORS TRAINING - PROVIDE RECOMMENDATIONS TO SE REGARDING INSPECTION & INVESTIGATION.	QTR 2, 79	NONE	NONE
T154	EXO TRANSIENT CHF TESTS COMPLETE. SUPPORT EXISTING CORRELATION CN RECOMMEND A NEW CORRELATION.	QTR 3, 79	2-BUR-BDHT	E. H. DAVIDSON
T141	DOSE TO CONSTRUCTION WORKERS AT OPERATING REACTOR SITES. PROVIDE VALUES FOR THE RADIATION DOSES RECEIVED BY CONSTRUCTION WORKERS AT OPERATING REACTOR SITES. TO BE USED IN ENVIRONMENTAL STATEMENT FOR CONSTRUCTION OF REACTORS ADJACENT TO OPERATING UNITS.	QTR 3, 79	74-OCCUPATIONAL EXPOSURES AND PROTECTION	J. FOULKE
T44	WLD REPAIR INTEGRITY. PROVIDES BACK-GROUND TO PERMIT OR DENY VESSEL WELD REPAIRS.	QTR 3, 79	20-VESSEL INTEGRITY	E. K. LYNN
T74	TROR 1 (BE) RELEASED. PROVIDES LICENSING WITH A FAST RUNNING BEST ESTIMATE CODE FOR SENSITIVITY STUDIES.	QTR 3, 79	16-ADVANCED SYSTEM CODE	N. ZUBER

PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (CONTINUED)

TEMP. NO.	SUBJECT/TITLE/IMPACT	TARGET DATE	REG. # AND NAME	REG. CHAIRMAN
175	CONDUIT & BARRIER GUIDE LINES. TO FORM BASIS FOR NEW GUIDES.	QTR 3, 79	23-FIRE PROTECTION	R. FEIT
176	FAILURE ANALYSIS METHODS FOR CELL LINERS. ASSESSMENT OF CONTAINMENT INTEGRITY UNDER ACCIDENT LOADS.	QTR 3, 79	20-PRIMARY SYSTEM INTEGRITY	T. J. WALKER
179	WRAP EM/PWR - INCORPORATES INTEGRATED AND AUTOMATED IMPROVEMENTS INTO A LICENSING CODE PACKAGE.	QTR 3, 79	NONE	NONE
183	THERMAL SHOCK AND STEAM LINE BREAK ANALYSIS. PROVIDES A LICENSING PROCEDURE FOR THERMAL SHOCK ANALYSIS. MAY RESULT IN TECH. SPEC. CHANGES.	QTR 4, 79	20-VESSEL INTEGRITY	E. K. LYNN
184	VERIFY FRAP 14. ADDS TO FRAP 13; A) PRELIMINARY CAPABILITY FOR MULTI-ROD GEOMETRY AND B) CAPABILITY TO EVALUATE STATISTICAL VARIATIONS IN MODELS.	QTR 4, 79	12-FUEL BEHAVIOR	W. V. JOHNSTON
177	BEACON MOD 3. INTEGRATES SEVERAL PACKAGES IN BEACON INCLUDING PSS POOL DYNAMICS, ICE CONDENSER, AND H2 CONCENTRATION ANALYSIS.	QTR 4, 79	15-CONTAINMENT CODE	S. FABIC
181	TRANSIENT ECC BYPASS CORRELATION. MAY CHANGE APPENDIX K FROM USE OF "END OF BYPASS" MODEL AND MD ECC PRIOR TO EOB, TO NEW CORRELATION.	QTR 4, 79	6-ECC BYPASS	A. SERRIZ
180	MELTDOWN RELEASE CORRELATION. CONFIRMS CONSERVATISM OF REG. GUIDE ASSUMPTIONS FOR ACCIDENT ANALYSIS.	QTR 4, 79	13-FUEL MELT	R. DISALVO
181	INTERFACE SHEAR TRANSFER TEST. MAY IMPACT SEISMIC DESIGN REQUIREMENTS FOR REINFORCED CONCRETE CONTAINMENTS, OR CONFIRM EXISTING REQUIREMENTS.	QTR 4, 79	55-ENVIRON. STRUCTURAL DESIGN	J. HARBOUR
185	ATLAS TRAC VERSION. PROVIDES ADVANCED CAPABILITY TO ANALYZE PINS IN LWR'S.	QTR 4, 79	14-ADVANCED SYSTEM CODE	N. ZUBER
187	EVALUATE NEED FOR DIAGONAL REINFORCING BARS. MAY IMPACT SEISMIC DESIGN REQUIREMENTS FOR REINFORCED CONCRETE CONTAINMENTS, OR CONFIRM EXISTING REQUIREMENTS.	QTR 4, 79	55-ENVIRON. STRUCTURAL DESIGN	J. HARBOUR
188	LOS ALAMOS FUEL MODEL RELEASED. RE-ASSESSMENT OF FUEL FAILURE LOCATION OF WEDA ANALYSIS.	QTR 4, 79	40-SIMMER CODE	R. CURTIS

PROJECTED NEAR-TERM KESLAPCH INFORMATION LETTERS (CONTINUED)

TEMP. SUBJ.	SUBJECT/TITLE/IMPACT	TARGET DATE	REQ. # AND NAME	REQ. CHAIRMAN
T89	MIX AEROSOL TESTS. AEROSOL MODEL VALIDATION.	QTR 4, 79	25-AEROSOL RELEASE & TRANSPORT	M. SILBERBERG
T90	POST CHF HEAT TRANSFER CORRELATION VERIFICATION COMPLETE. SUPPORTS OR REPLACED CURRENT CORRELATIONS.	QTR 4, 79	3-PWR-BDHT 4-BWR-BDHT	L. H. DAVIDSON E. H. DAVIDSON
T92	SEISMIC RISK MODELING	QTR 4, 79	?	T. BUHL
T94	17 X 17 REFLOOD HEAT TRANSFER CORRELATION VERIFIED. MAY REQUIRE NEW SECTION OF APPENDIX K TO ADDRESS THIS GEOMETRY.	QTR 4, 79	5-REFLOOD HEAT TRANSFER	E. H. DAVIDSON
T95	FSV DESIGN BASIS TRANSIENTS. DEPENDS UPON QTR 1, 80 THE RESULTS OBTAINED.	QTR 1, 80	30-OCR ACCIDENT DELINEATION AND ANALYSIS	B. SCHAMBERGER
T84	UNI-ECCS TESTS. PROVIDES NRR BASIS FOR UNI LICENSING DECISIONS AND MAY REQUIRE NEW SECTION IN APPENDIX K.	QTR 1, 80	2-SEMISCLE	M. W. LANNING
T65	PERMITTLEMENT CRITERIA. MAY REPLACE EXISTING CRITERIA IN APPENDIX K.	QTR 1, 80	8-ZIRCALOY CLADDING	M. L. PICKLESIMER
T94	INOR 1 (EM) RELEASED. PROVIDES LICENSING WITH ADVANCED EVALUATION MODEL CODE FOR AUDIT CALCULATIONS.	QTR 1, 80	14-ADVANCED SYSTEM CODE	N. ZUBER
T95	VEP "PAC-2. GIVES CONFIDENCE THRU COM WITH LOFT, GERMAN AND JAPANESE TEST DATA.	QTR 1, 80	17-VERIFICATION	L. S. TONG
T96	VERIFY HEAT TRANSFER CORRELATION. CONFIDENCE IN THE CORRELATION IS INCREASED THRU COMPARISON WITH WOULD WIDE TEST DATA.	QTR 1, 80	17-VERIFICATION	L. S. TONG
T97	PELAP 4 MOD 7. USE CONVENIENT FOR LOCA CODE	QTR 1, 80	16-REFERENCE SYSTEM CODE	S. FABIC
T100	PROBABILITY AND CONSEQUENCES OF STEAM EXPLOSIONS. POSSIBLY WILL PROVIDE A QUANTITATIVE PREDICTION OF STEAM EXPLOSIONS MOSTLY APPLICABLE TO FLOATING PLANTS.	QTR 1, 80	13-FUEL MGT	R. DISALVO
T101	UPDAYS. XIR CURVE-DUCTILE SHELF TOUGHNESS. PROVIDES BASIS FOR HEAT UP - COOLDOWN CURVES IN OPERATING PLANTS.	QTR 1, 80	20-VESSEL INTEGRITY	E. K. LYNN

PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (CONTINUED)

TEMP. BUBBL.	SUBJECT/INITIAL-IMPACT	TARGET DATE	REG. #	IND. NAME	REG. CHAIRMAN
T102	UPDATE KIR CURVE-CRACK ARREST. BASIS FOR SEVERE ACCIDENT ANALYSIS ARREST EVALUATION.	QTR 1, 80	20-VESSEL INTEGRITY	E. K. LYNN	E. K. LYNN
T104	REACTOR PRESSURE VESSEL SURVEILLANCE PROCEDURE. PROVIDES BACKGROUND TO ACCURATELY EVALUATE SURVEILLANCE COMMITMENT AND PROVIDE SAFE LIFEPLANS.	QTR 1, 80	20-VESSEL INTEGRITY	E. K. LYNN	E. K. LYNN
T107	IMPROVED LOOSE PARTS MONITORING. PROVIDES QTR 1, 29 INPUT TO REG. GUIDE REQUIREMENT CHANGE AND TO LICENSING REVIEW.	QTR 1, 80	69-NOISE SURVEILLANCE AND DIAGNOSTICS	W. FARMER	W. FARMER
T109	EVALUATE METHOD TO CALCULATE COASTAL DISPERSION. MAY IMPACT ON LICENSING EVALUATION OF CLOSE-IN ACCIDENTAL RELEASE CONCENTRATIONS.	QTR 1, 80	62-LWR RISK ASSESSMENT	J. MURPHY	J. MURPHY
T149	EXTINGUISHING SYSTEM EVALUATION	QTR 1, 80	23-FIRE PROTECTION	R. FEIT	R. FEIT
T150	DETECTION SYSTEM EVALUATION	QTR 1, 80	23-FIRE PROTECTION	R. FEIT	R. FEIT
T151	AGING MODEL	QTR 1, 80	77-QUALIFICATION TESTING EVALUATION	R. FEIT	R. FEIT
T155	DATA BASE. INCORPORATES REACTOR DESIGN AND OPERATING DATA BASES IN PELAP 5.	QTR 2, 80	NONE	NONE	NONE
T105	INCORPORATE IMPROVED UT IN CODE. IMPROVED QTR 2, 80 CONFIDENCE IN EVALUATION OF FLOW SIG-NIFICANCE FROM ACCURATE FLOW SHAPE AND SIZE.	QTR 2, 80	21-NON-DESTRUCTIVE EXAMINATION	J. MUSCARA	J. MUSCARA
T106	VALIDATE ACOUSTICS EMISSION FLAM CORRELA-TION. VALIDATES THE DETECTION, IDENTIFICATION & ELIMINATION OF FLAWS DURING WELDING - LATER EVALUATION NOT NEEDED.	QTR 2, 80	21-NON-DESTRUCTIVE EXAMINATION	J. MUSCARA	J. MUSCARA
T110	COMNIX CODE (TWO-PHASE). REASSESSMENT OF COOLABILITY OF SUBASSEMBLY UNDER NATURAL CONVECTION.	QTR 2, 80	32-SYSTEMS CODES AND ACCIDENT ANALYSIS	P. M. WOOD	P. M. WOOD
T111	CREEP FATIGUE INTERACTION TESTS AND CODE. "CERTIFIES DESIGN RULES FOR LONG TERM PRIMARY SYSTEM INTEGRITY."	QTR 2, 80	28-PRIMARY SYSTEM INTEGRITY	T. J. WALKER	T. J. WALKER

PROJECTED NEAR-TERM RESEARCH INFORMATION LETTERS (CONTINUED)

TEMP. NUMB.	SUBJECT/TITLE/IMPACT	TARGET DATE	REG. # AND NAME	REG. CHAIRMAN
T112	CONTAINMENT PRESSURE PULSE ANALYSIS METHODS. CONCLUSIONS MAY EFFECT THE LICENSING POSITION ON DEPRESSURIZATION ACCIDENTS.	QTR 2, 80	3A-CCR STRUCTURAL	R. D. SCHARBERGER
T145	FRAGILITY LIMITS FOR ELECTRICAL EQUIPMENT. C & R 3, 80 MAY BE BASIS FOR REG. GUIDE OR EFFECT DESIGN CRITERIA.	QTR 3, 80	7D-PLANT STRUCTURES	J. RICHARDSON
T199	8 X 8 BUNDLE TESTS. CONFIRMS ABILITY TO LIMIT PROPAGATION AND MAINTAIN LODABLE GEOMETRY.	QTR 3, 80	8-ZIRC/LOY CLADDING	M. L. PICKLESIMER
T167	CYCLIC CRACK GROWTH RATE EVALUATION. NEW CURVE FOR ASME XI CRACK GROWTH RATE.	QTR 4, 80	2D-VESSEL INTEGRITY	E. K. LYNN
T168	RECOMMEND OPTIMIZED PIPING SYSTEM DESIGN. GUIDELINES FOR SAFER PIPING SYSTEMS	QTR 4, 80	2D-VESSEL INTEGRITY	E. K. LYNN
T198	SMALL CLUSTER TESTS. CONFIRMS ABILITY TO LIMIT PROPAGATION AND MAINTAIN LODABLE GEOMETRY.	QTR 4, 80	1D-PEF EXPERIMENTAL PROGRAMS	R. VAN HOUTEN
T105	SAFETY RELATED OPERATOR ACTING CRITERIA. HAY IMPACT ENGINEERED SAFETY SYSTEMS	QTR 4, 80	24-HUMAN ENGINEERING	M. S. FARMER

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