

NUREG-0606  
Vol. 6, No. 3  
August 17, 1984

# UNRESOLVED SAFETY ISSUES SUMMARY

AQUA BOOK

UNITED STATES NUCLEAR REGULATORY COMMISSION



8409260639 840831  
PDR NUREG  
0606 R PDR

NUREG-0606  
Vol. 6, No. 3  
August 17, 1984

---

---

# UNRESOLVED SAFETY ISSUES SUMMARY

## AQUA BOOK

---

---

Manuscript Completed: August 1984  
Date Completed: August 1984

Compiled by: Judy Butts

OFFICE OF NUCLEAR REACTOR REGULATION  
U. S. NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555



## FOREWORD

THE UNRESOLVED SAFETY ISSUES SUMMARY IS DESIGNED TO PROVIDE THE MANAGEMENT OF THE NUCLEAR REGULATORY COMMISSION WITH A QUARTERLY OVERVIEW OF THE PROGRESS AND PLANS FOR COMPLETION OF GENERIC TASKS ADDRESSING UNRESOLVED SAFETY ISSUES REPORTED TO CONGRESS PURSUANT TO SECTION 210 OF THE ENERGY REORGANIZATION ACT OF 1974 AS AMENDED. THIS SUMMARY UTILIZES DATA COLLECTED FROM THE OFFICE OF NUCLEAR REACTOR REGULATION, OFFICE OF NUCLEAR REGULATORY RESEARCH, AND THE NATIONAL LABORATORIES AND IS PREPARED BY THE OFFICE OF NUCLEAR REACTOR REGULATION.

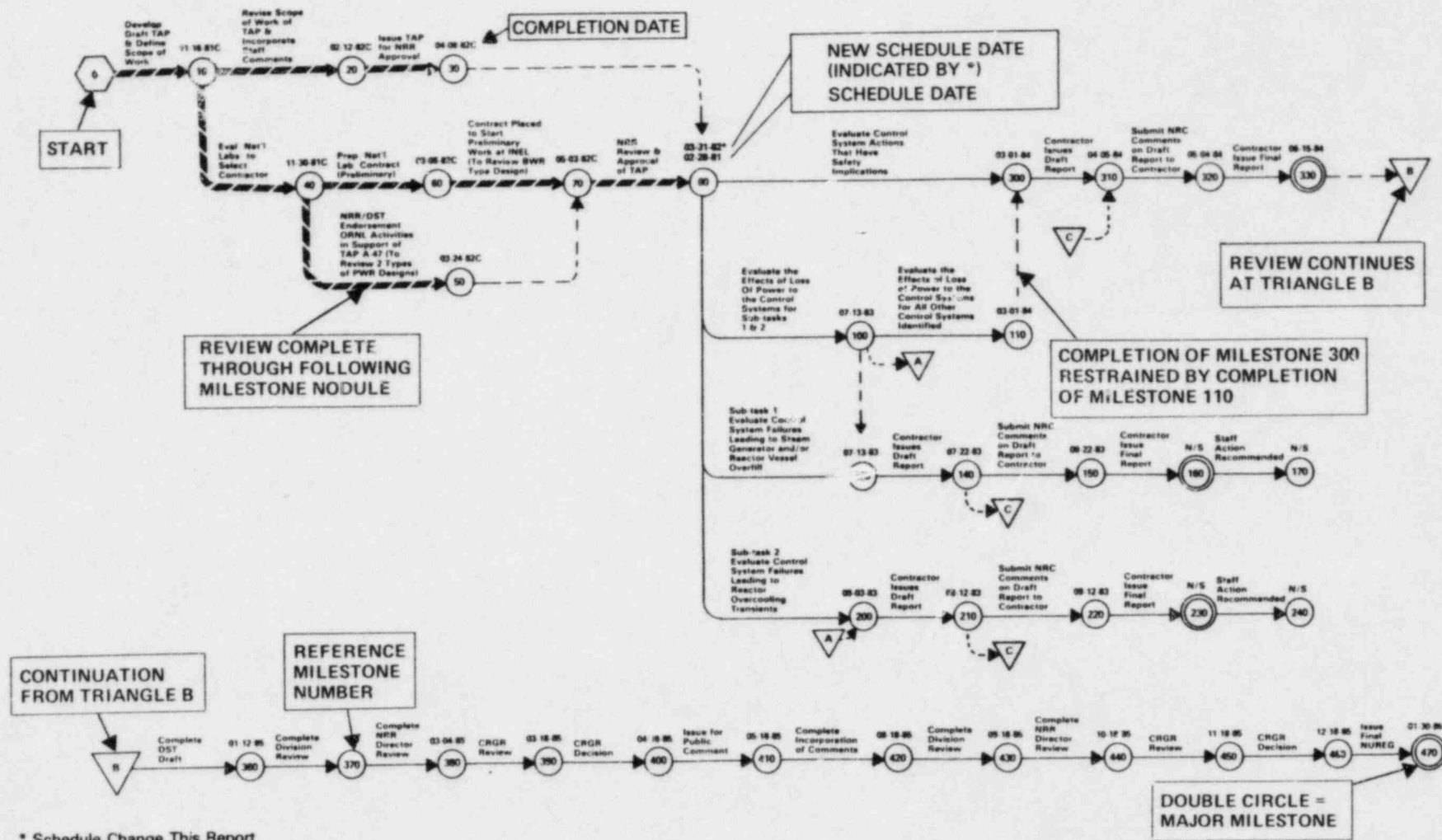
THE DEFINITION OF WHAT CONSTITUTES COMPLETION OF AN UNRESOLVED SAFETY ISSUE (USI) INCLUDES THE IMPLEMENTATION OF THE TECHNICAL RESOLUTION. THIS IS IN ACKNOWLEDGEMENT OF THE FACT THAT REAL SAFETY BENEFITS OCCUR ONLY AFTER THE IMPLEMENTATION HAS TAKEN PLACE. IMPORTANT ELEMENTS OF THIS IMPLEMENTATION PHASE ARE:

- (1) THE PROVISION OF A PUBLIC COMMENT PERIOD FOLLOWING THE ISSUANCE OF A DRAFT NUREG REPORT INCORPORATING THE STAFF'S TECHNICAL RESOLUTION FOLLOWED BY A DISCUSSION AND DISPOSITION OF THE COMMENTS RECEIVED IN A FINAL NUREG REPORT.
- (2) THE PROVISION FOR INCORPORATION OF THE TECHNICAL RESOLUTION INTO THE NRC'S REGULATIONS, STANDARD REVIEW PLAN, REGULATORY GUIDES, OR OTHER NRC OFFICIAL GUIDANCE OR REQUIREMENTS, AS APPROPRIATE.
- (3) THE PROVISION FOR APPLICATION OF THE TECHNICAL RESOLUTION TO INDIVIDUAL OPERATING PLANTS IN THE FORM OF HARDWARE OR DESIGN CHANGES, TECHNICAL SPECIFICATION CHANGE, AND/OR CHANGE TO OPERATING PROCEDURES AND TRAINING, AS APPROPRIATE.

THE MILESTONE CHARTS FOR EACH USI SHOW THE CURRENT SCHEDULE AS OF THE DATE OF PUBLICATION. IF A MILESTONE DATE HAS CHANGED SINCE THE LAST REPORT, THE OLD DATE WILL BE SHOWN WITH THE NEW DATE IMMEDIATELY ABOVE IT. THE NEW DATE WILL BE MARKED WITH AN ASTERISK WITH A FOOTNOTE INDICATING THAT A SCHEDULE CHANGE HAS BEEN MADE. THE PROGRAM STATUS TABLE WHICH BEGINS ON PAGE 3 OF THIS NUREG SHOWS THE COMPLETION DATE STATED IN THE LATEST APPROVED TASK ACTION PLAN AND THE CURRENT SCHEDULED COMPLETION DATE. THE MILESTONE AT THE END OF EACH ACTION PLAN WHICH REPRESENTS THE INITIATION OF THE IMPLEMENTATION OF THE IMPLEMENTATION PROCESS BOTH WITH RESPECT TO INCORPORATION OF THE TECHNICAL RESOLUTION IN THE NRC OFFICIAL GUIDANCE OR REQUIREMENTS AND ALSO THE APPLICATION OF CHANGES TO INDIVIDUAL OPERATING PLANTS. THE SCHEDULE FOR IMPLEMENTATION WILL NOT NORMALLY BE INCLUDED IN THE TASK ACTION PLAN(S) FOR THE RESOLUTION OF A USI SINCE THE NATURE AND EXTENT OF THE ACTIVITIES NECESSARY TO ACCOMPLISH THE IMPLEMENTATION CANNOT NORMALLY BE REASONABLY DETERMINED PRIOR TO THE DETERMINATION OF A TECHNICAL RESOLUTION. THE PROGRESS AND STATUS FOR IMPLEMENTATION OF UNRESOLVED SAFETY ISSUES FOR WHICH A TECHNICAL RESOLUTION HAS BEEN COMPLETED ARE REPORTED SPECIFICALLY IN A SEPARATE TABLE PROVIDED IN THIS SUMMARY. MORE DETAIL ON THE STATUS OF IMPLEMENTATION IN PROGRESS ON A SPECIFIC UNRESOLVED SAFETY ISSUE WHERE THE TECHNICAL RESOLUTION REQUIRES CHANGES TO INDIVIDUAL OPERATING PLANTS IS PROVIDED IN NUREG-0748, "OPERATING REACTORS LICENSING ACTIONS SUMMARY" WHICH IS PUBLISHED MONTHLY.

KARL KNIEL, CHIEF OF THE GENERIC ISSUES BRANCH, DIVISION OF SAFETY TECHNOLOGY/NRR, IS RESPONSIBLE FOR MANAGING THE GENERIC TASKS INCLUDED IN THIS SUMMARY.

EXAMPLE PAGE



\* Schedule Change This Report  
N/S = Not Scheduled Date

## TABLE OF CONTENTS

<u>PAGE NO.</u>	<u>TASK NO.</u>	<u>TASK MANAGER</u>	<u>DESCRIPTION</u>
1-2	---	---	ABBREVIATIONS
3-4	---	---	PROGRAM STATUS
5-9	---	---	USI'S FOR WHICH TECHNICAL RESOLUTION IS COMPLETE
10-11	A-3, A-4, A-5	JACK STROSNIDER	W, CE, AND B&W STEAM GENERATOR TUBE INTEGRITY
12-15	A-17	DALE THATCHER	SYSTEMS INTERACTIONS IN NUCLEAR POWER PLANTS
16-19	A-40	SYED SHAUKAT	SEISMIC DESIGN CRITERIA-SHORT TERM PROGRAM
20-21	A-43	ALECK SERKIZ	CONTAINMENT EMERGENCY SUMP PERFORMANCE
22-23	A-44	ALAN RUBIN	STATION BLACKOUT
24-27	A-45	ANDREW MARCHESE	SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS
28-31	A-46	T. Y. CHANG	SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS
32-37	A-47	ANDREW SZUKIEWICZ	SAFETY IMPLICATIONS OF CONTROL SYSTEMS
38-41	A-48	TSUNG SU	HYDROGEN CONTROL MEASURES AND EFFECTS OF HYDROGEN BURNS ON SAFETY EQUIPMENT
42-48	A-49	ROY WOODS	PRESSURIZED THERMAL SHOCK

## ABBREVIATIONS

AAB:	ACCIDENT ANALYSIS BRANCH (FORMER NRR BRANCH)	ECC:	EMERGENCY CORE COOLING
AB:	ADMINISTRATION BRANCH, TRAINING AND ADMINISTRATION STAFF (IE)	EEB:	ENVIRONMENTAL ENGINEERING BRANCH, DIVISION OF ENGINEERING (NRR)
AC:	ALTERNATING CURRENT	EFPY:	EFFECTIVE FULL-POWER YEARS
ACRS:	ADVISORY COMMITTEE ON REACTOR SAFEGUARDS	EG&G:	EDGERTON, GERMESHAUSEN & GRIER
AD:	ASSISTANT DIRECTOR	EP:	EMERGENCY PREPAREDNESS
ADB:	ANALYSIS AND DEVELOPMENT BRANCH, DIVISION OF REACTOR SAFETY RESEARCH (RES)	EPRI:	ELECTRIC POWER RESEARCH INSTITUTE
AEB:	ACCIDENT EVALUATION BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	EQB:	EQUIPMENT QUALIFICATION BRANCH, DIVISION OF ENGINEERING (NRR)
AEOD:	OFFICE OF THE ANALYSIS AND EVALUATION OF OPERATIONAL DATA	FIN:	FINANCIAL
AIF:	ATOMIC INDUSTRIAL FORUM	FSTF:	FULL-SCALE TEST FACILITY
APFS:	ACTION PLAN TRACKING SYSTEM	FW:	FEEDWATER
ARL:	ALDEN RESEARCH LABORATORY	FY:	FISCAL YEAR
ASB:	AUXILIARY SYSTEMS BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	GSB:	GEOSCIENCES BRANCH, DIVISION OF ENGINEERING (NRR)
ASME:	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	GE:	GENERAL ELECTRIC
ASTM:	AMERICAN SOCIETY OF TESTING MATERIALS	GIB:	GENERIC ISSUES BRANCH, DIVISION OF SAFETY TECHNOLOGY (NRR)
ATWS:	ANTICIPATED TRANSIENT WITHOUT SCRAM	HFEB:	HUMAN FACTORS ENGINEERING BRANCH, DIVISION OF HEALTH, SITING AND WASTE MGMT. (RES)
BG&E:	BALTIMORE GAS AND ELECTRIC COMPANY	HSST:	HEAVY SECTION STEEL TECHNOLOGY
B&W:	BABCOCK AND WILCOX COMPANY	ICBR:	INSTRUMENTATION AND CONTROL BRANCH, DIVISION OF FACILITY OPERATIONS (RES)
BNC:	BROOKHAVEN NATIONAL CONSERVATORY	ICSB:	INSTRUMENTATION AND CONTROL SYSTEMS BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)
BNL:	BROOKHAVEN NATIONAL LABORATORY	IE:	OFFICE OF INSPECTION AND ENFORCEMENT
BOP:	BALANCE OF PLANT	IEEE:	INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
BWR:	BOILING WATER REACTOR	INEL:	IDAHO NUCLEAR ENGINEERING LABORATORY
CE:	COMBUSTION ENGINEERING, INCORPORATED	IP:	INDIAN POINT
CEB:	CHEMICAL ENGINEERING BRANCH, DIVISION OF ENGINEERING (NRR)	IREP:	INTEGRATED RELIABILITY EVALUATION PROGRAM
CFR:	CODE OF FEDERAL REGULATIONS	ISI:	IN-SERVICE INSPECTION
CP:	CONSTRUCTION PERMIT	LANL:	LOS ALAMOS NATIONAL LABORATORY
CPB:	CORE PERFORMANCE BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	LER:	LICENSEE EVENT REPORT
CR:	CONTRACTOR REPORT	LLNL:	LAWRENCE LIVERMORE NATIONAL LABORATORY
CRGR:	COMMITTEE TO REVIEW GENERIC REQUIREMENTS	LOCA:	LOSS-OF-COOLANT ACCIDENT
CSB:	CONTAINMENT SYSTEMS BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	LPP:	LEAD PLANT PROGRAM
DC:	DIRECT CURRENT	LTP:	LONG TERM PROGRAM
DE:	DIVISION OF ENGINEERING (NRR)	LWR:	LIGHT-WATER REACTOR
DEDROGR:	DEPUTY EXECUTIVE DIRECTOR FOR REGIONAL OPERATIONS AND GENERIC REQUIREMENTS	MARK I-III:	CONTAINMENT TYPES FOR BOILING WATER REACTORS
DFO:	DIVISION OF FACILITY OPERATIONS (RES)	MEB:	MECHANICAL ENGINEERING BRANCH, DIVISION OF ENGINEERING (NRR)
DHFS:	DIVISION OF HUMAN FACTORS SAFETY (NRR)	MEBR:	MATERIALS ENGINEERING BRANCH, DIVISION OF ENGINEERING TECHNOLOGY (RES)
DHRS:	DECAY HEAT REMOVAL SYSTEMS	MIT:	MASSACHUSETTS INSTITUTE OF TECHNOLOGY
DL:	DIVISION OF LICENSING (NRR)	MSLB:	MAIN STEAM LINE BREAK
DOE:	U. S. DEPARTMENT OF ENERGY	MTEB:	MATERIALS ENGINEERING BRANCH, DIVISION OF ENGINEERING (NRR)
DOR:	DIVISION OF OPERATING REACTORS (FORMER NRR DIVISION)	NDE:	NON-DESTRUCTIVE EXAMINATION
DRA:	DIVISION OF RISK ANALYSIS (RES)	NRC:	NUCLEAR REGULATORY COMMISSION
DSI:	DIVISION OF SYSTEMS INTEGRATION (NRR)	NREP:	NEUTRON RESONANCE ESCAPE PROBABILITY
DSS:	DIVISION OF SYSTEMS SAFETY (FORMER NRR DIVISION)	NRR:	OFFICE OF NUCLEAR REACTOR REGULATION
DST:	DIVISION OF SAFETY TECHNOLOGY (NRR)	NSS:	NUCLEAR STEAM SYSTEM
E:	ENGINEERING	NUREG:	NUCLEAR REGULATORY REPORT (PREPARED IN-HOUSE)
EB:	ENFORCEMENT BRANCH, ENFORCEMENT AND INVESTIGATIONS STAFF (IE)		

## ABBREVIATIONS

OL:	OPERATING LICENSE	SSE:	SAFE SHUTDOWN EARTHQUAKE
ORAB:	OPERATING REACTORS ASSESSMENT BRANCH, DIVISION OF LICENSING (NRR)	SSPB:	STANDARDS SPECIAL PROJECTS BRANCH DIVISION OF LICENSING (NRR)
ORB:	OPERATING REACTORS BRANCH, DIVISION OF LICENSING (NRR)	STP:	SHORT-TERM PROGRAM
ORNL:	OAK RIDGE NATIONAL LABORATORY	TAP:	TASK ACTION PLAN
OSD:	OFFICE OF STANDARDS DEVELOPMENT (FORMER NRC OFFICE)	TER:	TECHNICAL EVALUATION REPORT
OTSG:	ONCE-THROUGH STEAM GENERATOR	TH:	THERMAL HYDRAULICS
PASNY:	POWER AUTHORITY OF THE STATE OF NEW YORK	TM:	TASK MANAGER
PDA:	PRELIMINARY DESIGN APPROVAL	TMI:	THREE MILE ISLAND
PNL:	PACIFIC NORTHWEST LABORATORY (BATTELLE)	UCLA:	UNIVERSITY OF CALIFORNIA, LOS ANGELES
PRA:	PROBABILISTIC RISK ASSESSMENT	USI:	UNRESOLVED SAFETY ISSUE
PSB:	POWER SYSTEMS BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	W:	WESTINGHOUSE ELECTRIC CORPORATION
PSU:	PLANT SYSTEMS UNIT (AEOD)	WH:	WATER HAMMER
PTRB:	PROCEDURES AND TEST REVIEW BRANCH, DIVISION OF HUMAN FACTORS SAFETY (NRR)		
PWR:	PRESSURIZED WATER REACTOR		
RAB:	RADIOLOGICAL ASSESSMENT BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)		
RCIC:	REACTOR CORE ISOLATION COOLING		
REF:	REFERENCE		
RES:	OFFICE OF NUCLEAR REGULATORY RESEARCH		
RFP:	REQUEST FOR PROPOSAL		
RHR:	RESIDUAL HEAT REMOVAL		
RPV:	REACTOR PRESSURE VESSEL		
RM:	RESOURCE MANAGEMENT		
RRAB:	RELIABILITY AND RISK ASSESSMENTS BRANCH DIVISION OF SAFETY TECHNOLOGY (NRR)		
RRRC:	REGULATORY REQUIREMENTS REVIEW COMMITTEE		
RS:	REACTOR SAFETY (FORMER NRR BRANCH)		
RSB:	REACTOR SYSTEMS BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)		
RSSMAP:	REACTOR SAFETY STUDY METHODOLOGY APPLICATION PROGRAM		
RV:	REACTOR VESSEL		
SAI:	SCIENCE APPLICATIONS, INC.		
SCC:	STRESS-CORROSION CRACKING		
SGEB:	STRUCTURAL AND GEOTECHNICAL ENGINEERING BRANCH, DIVISION OF ENGINEERING (NRR)		
SEP:	SYSTEMATIC EVALUATION PROGRAM		
SEPB:	SYSTEMATIC EVALUATION PROGRAM BRANCH, DIVISION OF LICENSING (NRR)		
SER:	SAFETY EVALUATION REPORT		
SG:	STEAM GENERATOR		
SGWH:	STEAM GENERATOR WATER HAMMER		
SNL:	SANDIA NATIONAL LABORATORY		
SQUG:	SEISMIC QUALIFICATION UTILITIES GROUP		
SRP:	STANDARD REVIEW PLAN		
SRV:	SAFETY RELIEF VALVE		

## PROGRAM STATUS

USI NO.	TITLE	SCHEDULED COMPLETION DATE FROM LATEST APPROVED TASK ACTION PLAN	CURRENT SCHEDULED COMPLETION DATE	REMARKS
A-3, A-4, A-5.	STEAM GENERATOR TUBE INTEGRITY	MAY 1984	NOT SCHEDULED	A COMMISSION BRIEFING REGARDING THE PROPOSED RESOLUTION IS PLANNED FOR AUGUST 1984.
A-17.	SYSTEMS INTER-ACTIONS	MARCH 1986	MAY 30, 1986*	WORK ORIGINALLY PLANNED UNDER TAP A-17 AND TMI ACTION PLAN ITEM II C.3. SYSTEMS INTERACTION, WERE COMBINED UNDER USI A-17 AND A NEW TASK MANAGER APPOINTED. A REVISED TASK ACTION PLAN HAS BEEN APPROVED BY THE DIRECTOR. NRR ORNL HAS SUBMITTED A DRAFT REPORT ON A-17 FOR THE NRC STAFF REVIEW. ORNL WILL BE REVIEWING POTENTIAL SEARCH METHODS FOR USE IN UNCOVERING ADVERSE SYSTEMS INTERACTIONS.
A-40.	SEISMIC DESIGN CRITERIA	JANUARY 1985	JULY 1, 1985*	THE NRC STAFF INTERNAL REVIEW HAS BEEN COMPLETED. A VALUE/IMPACT ANALYSIS HAS BEEN PREPARED AND A CRGR SUBMITTAL PACKAGE IS TO BE SUBMITTED TO THE CRGR BY AUGUST 20, 1984.
A-43.	CONTAINMENT EMERGENCY SUMP	SEPTEMBER 30, 1984	SEPTEMBER 30, 1984	ALL TECHNICAL SUPPORT (NUREG/CR) REPORTS HAVE BEEN ISSUED. NUREG-0897 AND NUREG-0869 ALONG WITH SRP SECTION 6.2.2 WERE ISSUED FOR PUBLIC COMMENT IN MAY 1983. THE PUBLIC COMMENT PERIOD ENDED IN JULY 1983 AND THE COMMENTS RECEIVED WERE UTILIZED IN THE PREPARATION OF THE REVISED CRGR SUBMITTAL OF JUNE 14, 1984. A MEETING WAS HELD WITH THE CRGR ON JULY 11, 1984 AND FOLLOWUP DISCUSSIONS ARE CONTINUING WITH DEDROGR.
A-44.	STATION BLACKOUT	MAY 1985	JANUARY 30, 1986*	THE STAFF'S PROPOSED RECOMMENDATIONS TO RESOLVE A-44 BASED ON THE TECHNICAL FINDINGS, RESULTED IN THE RECOMMENDATION TO PROCEED WITH PROPOSED RULEMAKING, IN CONJUNCTION WITH A NEW REGULATORY GUIDE. THE CRGR RECOMMENDED THAT THE PROPOSED RULE, PROPOSED REGULATORY GUIDE AND NUREG-1032 BE ISSUED FOR PUBLIC COMMENT AFTER MODIFICATIONS ARE MADE TO REFLECT CRGR COMMENTS. THE WORK NECESSARY TO MAKE THESE MODIFICATIONS IS UNDERWAY.
A-45.	SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS	FEBRUARY 1986	FEBRUARY 28, 1986*	THE FIRST INTERIM MILESTONE REPORT WAS ISSUED FOR NRC STAFF REVIEW ON DECEMBER 22, 1982. AS A RESULT OF STAFF COMMENTS, A REVISED VERSION OF THIS REPORT WAS ISSUED FOR STAFF AND ACRS REVIEW ON JUNE 21, 1983. THE SECOND INTERIM MILESTONE REPORT WAS ISSUED FOR STAFF REVIEW ON MARCH 29, 1983. THE THIRD IN DRAFT FORM FOR THE STAFF REVIEW ON AUGUST 2, 1983. THE FOURTH IN FINAL FORM (NUREG/CR-3421). THE FIFTH REPORT ON SCREENING CRITERIA FOR LWR DECAY HEAT REMOVAL WAS ISSUED FOR STAFF REVIEW AND IS CURRENTLY UNDERGOING A SPECIAL INTERNAL STAFF EVALUATION. THE SIXTH AND SEVENTH REPORTS WERE ISSUED FOR STAFF COMMENT IN JANUARY 1984. THE EIGHTH REPORT ON FEED AND BLEED ANALYSES AND RESULTS FOR SPECIFIC PLANT TRANSIENTS IN B&W, CE AND WESTINGHOUSE PLANTS WAS ISSUED FOR STAFF COMMENT IN MAY 1984. THE NINTH CONTRACTOR INTERIM DRAFT MILESTONE REPORT ENTITLED, "CHARACTERIZATION OF DECAY HEAT REMOVAL SYSTEMS OF OPERATING AND SOON-TO-BE-OPERATING LIGHT WATER REACTORS," HAS BEEN ISSUED FOR STAFF COMMENT.

\*SCHEDULE CHANGE THIS REPORT



## PROGRAM STATUS

USI NO.	TITLE	SCHEDULED COMPLETION DATE FROM LATEST APPROVED TASK ACTION PLAN	CURRENT SCHEDULED COMPLETION DATE	REMARKS
A-46	SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS	DECEMBER 1984	MAY 1, 1985*	WORK ON ALL TASKS IS ESSENTIALLY COMPLETE WITH THE EXCEPTION OF TASK 4. AN INTERIM REPORT WHICH SUMMARIZES THE STATUS OF WORK ACCOMPLISHED ON A-46 WAS ISSUED AS NUREG-1018 IN OCTOBER 1983. THE A-46 CRGR PACKAGE (INCLUDING DRAFT NUREG-1030) WILL BE FORWARDED TO THE DIRECTOR OF NRR FOR REVIEW AND APPROVAL IN SEPTEMBER 1984.
A-47	SAFETY IMPLICATIONS OF CONTROL SYSTEMS	APRIL 1986	APRIL 1, 1986	DRAFT FINAL REPORT ON THE EFFECTS OF CONTROL SYSTEMS FAILURES ON TRANSIENTS AND ACCIDENTS FOR A GE DESIGN WAS SUBMITTED BY INEL FOR STAFF REVIEW IN JULY 1984.  DRAFT FINAL REPORT ON THE EFFECTS OF CONTROL SYSTEM FAILURES ON TRANSIENTS AND ACCIDENTS AT A WESTINGHOUSE 3-LOOP PWR WAS SUBMITTED BY INEL FOR STAFF REVIEW IN AUGUST 1984.
A-48	HYDROGEN CONTROL MEASURES AND HYDROGEN BURNS ON SAFETY EQUIPMENT	JUNE 1986	NOT SCHEDULED*	WORK ON THIS USI IS LIMITED TO THE GENERIC RESOLUTION OF HYDROGEN CONTROL AND EQUIPMENT QUALIFICATION FOR ICE CONDENSER AND BWR MARK III CONTAINMENTS. A COMMISSION PAPER REGARDING HYDROGEN CONTROL FOR MARK III AND ICE CONDENSER CONTAINMENT WAS REVIEWED AND ENDORSED BY THE CRGR ON JUNE 1, 1983. THE COMMISSION PAPER WAS FORWARDED TO THE COMMISSION ON AUGUST 26, 1983, AND ADDITIONAL INFORMATION PROVIDED ON DECEMBER 28, 1983. THE RESULTS OF THE LARGE SCALE HYDROGEN BURN TESTS CONDUCTED AT THE NEVADA TEST SITE SHOW POTENTIAL CHALLENGE TO EQUIPMENT SURVIVABILITY. THE STAFF IS EVALUATING THE DATA AND WILL MAKE RECOMMENDATIONS TO THE COMMISSION REGARDING THE HYDROGEN RULE. A SCHEDULE FOR THE REMAINING MILESTONES OF USI A-48 WILL BE DEVELOPED FOLLOWING COMPLETION OF THE STAFF'S EVALUATION OF THE LARGE SCALE HYDROGEN BURN TESTS.
A-49	PRESSURIZED THERMAL SHOCK	DECEMBER 31, 1985	MARCH 31, 1986	NRC STAFF PROPOSED PTS RULE WAS APPROVED BY THE COMMISSION IN JANUARY 1984. THIS NEW PTS RULE WAS PUBLISHED FOR PUBLIC COMMENT ON FEBRUARY 7, 1984. THE PROPOSED RULE IS BEING REVISED TO ADDRESS THE PUBLIC COMMENTS RECEIVED.

\*SCHEDULE CHANGE THIS REPORT

### USI'S FOR WHICH TECHNICAL RESOLUTION IS COMPLETE

USI NO.	TITLE	DATE COMPLETED	REPORTS PUBLISHED	IMPLEMENTATION STATUS	IMPLEMENTATION TASK MANAGER/ TELEPHONE
A-1	WATER HAMMER	MARCH 15, 1984	NUREG-0927, REV. 1 NUREG-0933, REV. 1 SRP SECTIONS 3.9.3, REV. 1 3.9.4, REV. 2 5.4.6, REV. 3 5.4.7, REV. 3 6.3, REV. 2 9.2.1, REV. 3 9.2.2, REV. 2 10.3, REV. 3 10.4.7, REV. 3	THE REVISED SRP SECTIONS WILL BE USED ONLY FOR REVIEW OF "CUSTOM PLANT" CONSTRUCTION PERMIT APPLICATIONS, AND FOR STANDARD PLANT APPLICATIONS DOCKETED AFTER THE ISSUANCE OF THESE SRP SECTION REVISIONS, WHICH ARE INTENDED FOR REFERENCING IN CONSTRUCTION PERMIT APPLICATIONS. (FORWARD FIT IMPLEMENTATION ONLY.)	- - -
A-2	ASYMMETRIC BLOWDOWN LOADS ON REACTOR PRIMARY COOLANT SYSTEMS	DEC. 1980	NUREG-0609	ALL PWR PLANT ASSESSMENTS FOR ASYMMETRIC LOADS HAVE BEEN RECEIVED AND HAVE BEEN EVALUATED BY THE STAFF AND EG&G. THE BASIS FOR THE EVALUATIONS WAS CRITERIA INCLUDED IN NUREG-0609 SER'S FOR ALL B&W OWNERS' GROUP PLANTS HAVE BEEN ISSUED. SER'S FOR THE COMBUSTION ENGINEERING OWNER'S GROUP PLANTS AND SER'S FOR THE PLANT-SPECIFIC SUBMITTALS ARE TO BE ISSUED PRIOR TO OCTOBER 1, 1984. THE WESTINGHOUSE OWNERS GROUP 'LEAK BEFORE BREAK' CONCEPT WAS APPROVED. THE SER WAS THE SUBJECT OF GL-84-04 DATED FEBRUARY 1, 1984. TACS FOR THE 16 AFFECTED PLANTS WERE CLOSED. THIS EFFORT WILL CLOSE THE MPA ITEM D-10.	JIM SHEA 492-7231
A-6	MARK I SHORT TERM PROGRAM	DEC. 1977	NUREG-0408	COMPLETE - ALL PLANT-UNIQUE ANALYSES AND EQUIPMENT MODIFICATIONS AS REQUIRED WERE REVIEWED AND ACCEPTED AND APPROPRIATE TECHNICAL SPECIFICATION CHANGES WERE MADE.	BYRON SIEGEL 492-7534

### USI'S FOR WHICH TECHNICAL RESOLUTION IS COMPLETE

<u>USI NO.</u>	<u>TITLE</u>	<u>DATE COMPLETED</u>	<u>REPORTS PUBLISHED</u>	<u>IMPLEMENTATION STATUS</u>	<u>IMPLEMENTATION TASK MANAGER/ TELEPHONE</u>
A-7.	MARK I LONG TERM PROGRAM	JULY 1980 AUGUST 1982	NUREG-0661 NUREG-0661, SUPPL. NO 1 SRP SECTION 6.2.1.1C	LICENSEES ARE IN THE PROCESS OF OR HAVE INSTALLED MODIFICATIONS TO MEET THE COMMISSION'S ORDER DATE FOR EACH OPERATING PLANT. MORE THAN HALF OF THE PLANTS AFFECTED HAVE COMPLETED THESE MODIFICATIONS. THE LICENSEES HAVE SUBMITTED PLANT-UNIQUE ANALYSES TO THE STAFF FOR POST-IMPLEMENTATION AUDIT REVIEW FOR COMPLIANCE WITH THE ACCEPTANCE CRITERIA CONTAINED IN APPENDIX A TO NUREG-0661. OUR CONTRACTORS, BNL AND THE FRANKLIN RESEARCH CENTER, ARE REVIEWING THESE SUBMITTALS AND HAVE COMPLETED THE REVIEW FOR ELEVEN PLANTS. SERS HAVE BEEN ISSUED FOR NINE PLANTS. SEE MULTIPLANT ACTION ITEM D-01 IN NUREG-0748.	BYRON SIEGEL 492-7534
A-8.	MARK II CONTAINMENT POOL DYNAMIC LOADS	AUGUST 1981	NUREG-0808 SRP SECTION 6.2.1.1C	THE REQUIREMENTS RECOMMENDED IN NUREG-0808 ARE BEING IMPLEMENTED DURING THE OPERATING LICENSE REVIEW FOR EACH PLANT WITH A MARK II CONTAINMENT. THESE REQUIREMENTS HAVE ALSO BEEN INCLUDED AS AN ADDITION TO THE APPROPRIATE SECTION OF THE STANDARD REVIEW PLAN.	BYRON SIEGEL 492-7534
A-9.	ATWS	SEPT. 1980	NUREG 0460, VOL 4 PROPOSED RULE 46FR57521 FINAL RULE 49FR57521	THE TECHNICAL FINDINGS FOR THIS ISSUE HAVE BEEN PUBLISHED IN NUREG-0460, "ANTICIPATED TRANSIENTS WITHOUT SCRAM FOR LIGHT WATER REACTORS," VOL 4. A PROPOSED RULE BASED ON THIS WORK PLUS ADDITIONAL ANALYSIS WAS PUBLISHED FOR COMMENT. THE COMMENTS RECEIVED WERE ADDRESSED AND A FINAL RULE WAS AFFIRMED BY THE COMMISSION IN NOVEMBER 1983. THE FINAL RULE WAS PUBLISHED ON JUNE 26, 1984. GUIDANCE FOR IMPLEMENTATION IS INCLUDED IN THE FINAL RULE.	DAVID PYATT, RES 443-7631

## USI'S FOR WHICH TECHNICAL RESOLUTION IS COMPLETE

<u>USI NO.</u>	<u>TITLE</u>	<u>DATE COMPLETED</u>	<u>REPORTS PUBLISHED</u>	<u>IMPLEMENTATION STATUS</u>	<u>IMPLEMENTATION TASK MANAGER/ TELEPHONE</u>
A-10.	BWR FEEDWATER NOZZLE CRACKING	NOV. 1980	NUREG-0619	RESPONSES FROM LICENSEES TO AN IMPLEMENTATION LETTER HAVE BEEN RECEIVED AND RECOMMENDED TREATMENT OF THESE RESPONSES HAVE BEEN SUBMITTED TO NRC MANAGEMENT. ADDITIONAL INFORMATION HAS BEEN REQUESTED OF LICENSEES. ALL PLANTS HAVE RECEIVED LETTERS ACCEPTING THEIR PROPOSED MODIFICATION PLANS. VERMONT YANKEE'S OPERATION IS SUCH THAT NO FEEDWATER NOZZLES NEED BE INSTALLED. LACROSSE, BIG ROCK POINT, AND DRESDEN 1 DO NOT HAVE SUSCEPTIBLE PLANT SYSTEM CONFIGURATIONS AND ARE CONSIDERED COMPLETE WITH REGARD TO THIS ACTION. HUMBOLDT BAY, BY VIRTUE OF ITS STATUS (SHUTDOWN, NO FORSEEABLE RESTART), IS ALSO CONSIDERED COMPLETE. COMPLETE - SEE MULTIPLANT ACTION ITEM B-25 IN NUREG-0748.	ROBERT GILBERT 492-7128
A-11.	REACTOR VESSEL MATERIALS TOUGHNESS	OCTOBER 15, 1982	NUREG-0744, VOLS. I AND II	GENERIC LETTER 82-26 TRANSMITTED THIS NUREG REPORT. NO FURTHER ACTION CONTEMPLATED.	AL DEAGAZIO 492-8945
A-12.	STEAM GENERATOR & REACTOR COOLANT PUMP SUPPORTS	OCTOBER 11, 1983	NUREG-0577, REVISION 1 SRP SECTION 5.3.4	THE PROPOSED A-12 RESOLUTION IMPLEMENTATION WILL APPLY TO NEW CONSTRUCTION ONLY THROUGH A NEW SRP SECTION 5.3.4 WITH NO BACKFITTING. SRP SECTION 5.3.4 HAS BEEN REVISED BASED ON PUBLIC COMMENTS RECEIVED AND FURTHER REVIEW BY THE STAFF AND CRGR. THE REVISED SRP SECTION 5.3.4 IS PART OF AN ISSUANCE PACKAGE WHICH IS UNDERGOING FINAL REVIEW PRIOR TO SUBMITTAL TO THE EXECUTIVE DIRECTOR FOR OPERATIONS.	RICHARD JOHNSON 492-4715

### USI'S FOR WHICH TECHNICAL RESOLUTION IS COMPLETE

<u>USI NO.</u>	<u>TITLE</u>	<u>DATE COMPLETED</u>	<u>REPORTS PUBLISHED</u>	<u>IMPLEMENTATION STATUS</u>	<u>IMPLEMENTATION TASK MANAGER/ TELEPHONE</u>
A-24.	QUALIFICATION OF CLASS 1E SAFETY RELATED EQUIPMENT	AUG. 1981	NUREG-0588 NEW RULE 48FR2729	EQB HAS THE LEAD IN IMPLEMENTING THE POSITIONS IDENTIFIED IN THE REPORT. SEE MULTIPLANT ACTION ITEM B-60 IN NUREG-0748.	JOSE CALVO 492-8563
A-26.	REACTOR VESSEL PRESSURE TRANSIENT PROTECTION	SEPT. 1978	NUREG-0224 SRP SECTION 5.2	ALL PLANTS WERE REQUESTED TO PROVIDE AN OVERPRESSURE PREVENTION SYSTEM THAT WOULD BE USED WHENEVER THE PLANT WAS IN A COLD SHUTDOWN CONDITION. ALL PWRs IMPLEMENTED THEIR SYSTEMS WITH PRELIMINARY APPROVAL FROM THE NRC, AND A COMPLETE REVIEW TOOK PLACE ON A POST-IMPLEMENTATION BASIS. ONE LICENSING ACTION REMAINS TO BE COMPLETED. SEE MULTIPLANT ACTION ITEM B-04 IN NUREG-0748.	AL DEAGAZIO 492-8945
A-31.	RESIDUAL HEAT REMOVAL REQUIREMENTS	MAY 1978	REGULATORY GUIDE 1.139 SRP SECTION 5.4.7 REGULATORY GUIDE (DRAFT) 1.113	RRRC APPROVED IMPLEMENTATION PLAN JANUARY 31, 1978 BEING IMPLEMENTED ON NTOLS DURING THE REVIEW PROCESS. NO BACKFIT TO OPERATING REACTORS IS PLANNED.	- - -
A-36.	CONTROL OF HEAVY LOADS NEAR SPENT FUEL	JULY 1980	NUREG-0612 SRP SECTIONS 9.1.2, 9.1.4, 13.1.3 REGULATORY GUIDES 1.33, 1.13, REV. 1 (DRAFT) 1.12, REV. 2	IMPLEMENTATION REQUIREMENTS WERE ISSUED TO ALL LICENSEES BY LETTER DATED DECEMBER 22, 1980. THE LETTER REQUESTED INTERIM ACTIONS TO BE COMPLETED IN 90 DAYS. A PHASE I ACTION (REPORT, CONFIRMATION AND JUSTIFICATION) IN SIX MONTHS AND PHASE II (SPECIFIC REQUIREMENTS) IN NINE MONTHS. ALL LICENSEES HAVE RESPONDED TO THE DECEMBER 22, 1980 GENERIC LETTER AND THEIR RESPONSES ARE BEING EVALUATED. AS OF AUGUST 17, 1984, 54 PHASE I REVIEWS HAVE BEEN COMPLETED AND IT IS ANTICIPATED TO COMPLETE A TOTAL OF 64 BY THE END OF FY-84. THE REMAINING 16 PHASE I REVIEWS WILL BE COMPLETED IN FY-85. MPA C-15, HAS BEEN ESTABLISHED FOR PHASE II, AND 20 FACILITIES ARE BEING REVIEWED IN A PILOT PROGRAM.	DON NEIGHBORS 492-4837

### USI'S FOR WHICH TECHNICAL RESOLUTION IS COMPLETE

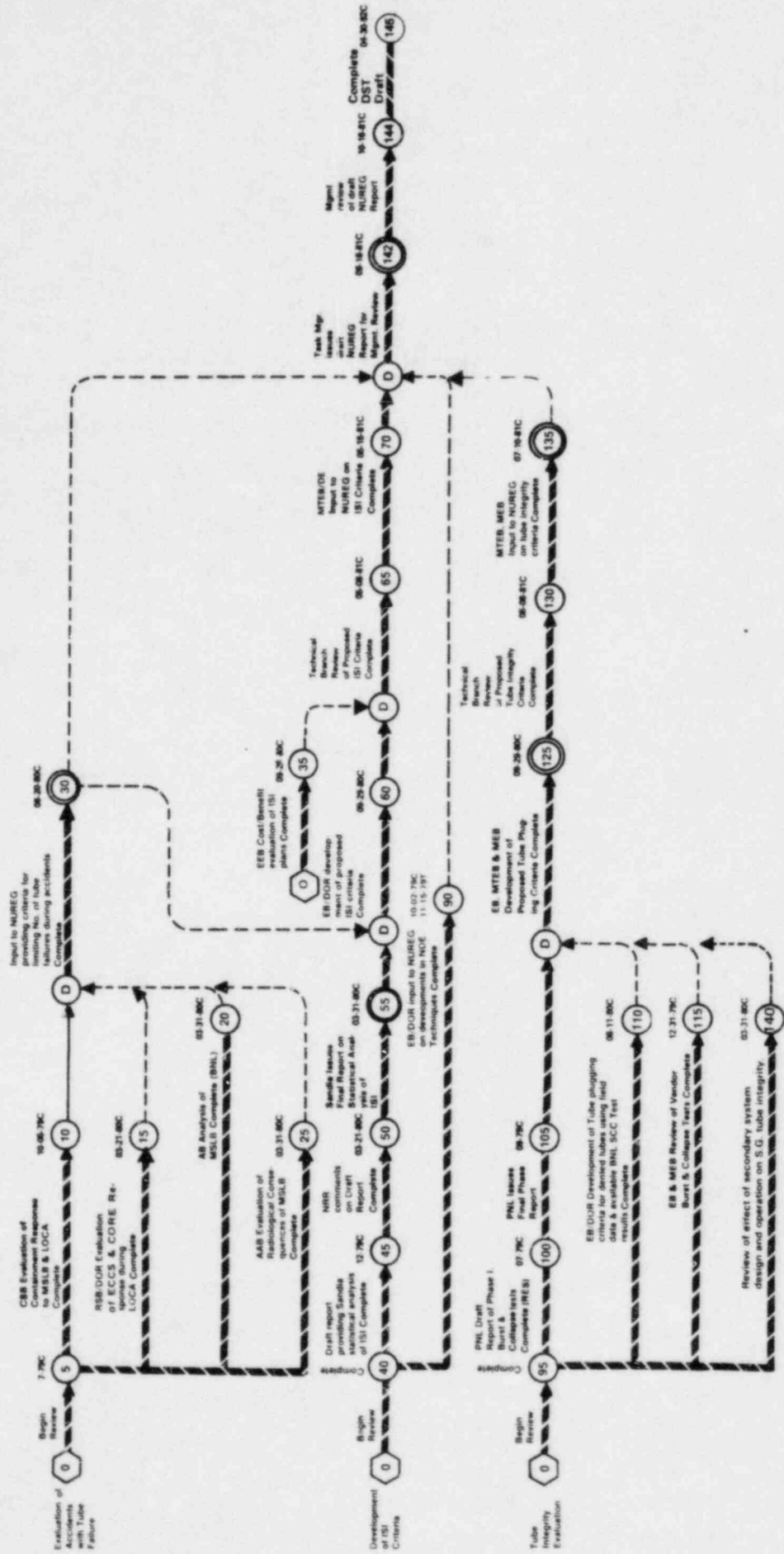
<u>USI NO.</u>	<u>TITLE</u>	<u>DATE COMPLETED</u>	<u>REPORTS PUBLISHED</u>	<u>IMPLEMENTATION STATUS</u>	<u>IMPLEMENTATION TASK MANAGER/ TELEPHONE</u>
A-39.	DETERMINATION OF SAFETY RELIEF VALVE (SRV) POOL DYNAMIC LOADS AND TEMPERATURE LIMITS FOR BWR CONTAINMENT	MARK I-02-29-80 MARK II-09-30-82 MARK III-10-14-82	NUREG-0763 NUREG-0783 NUREG-0802 SRP SECTION 8.2.1.1C	GENERIC LETTERS TRANSMITTING THESE NUREGS TO BWR APPLICANTS AND LICENSEES HAVE BEEN ISSUED. IMPLEMENTATION ON MARK I PLANTS IS PART OF USI A-7. IMPLEMENTATION ON MARK II AND MARK III PLANTS IS BEING PERFORMED DURING THE OPERATING LICENSE REVIEW FOR EACH PLANT.	BYRON SIEGEL 492-7534
A-42.	PIPE CRACKS IN BOILING WATER REACTORS	JULY 1980	NUREG-0313 REV. 1	IN FEBRUARY 1981, NUREG-0313, REV 1 WAS ISSUED TO ALL HOLDERS OF BWR OPERATING LICENSES OR CONSTRUCTION PERMITS AND TO ALL APPLICANTS FOR OPERATING LICENSES. BY JULY 1, 1981, THE APPLICANTS/LICENSEES WERE TO PROVIDE THEIR PROGRAM FOR REPLACEMENT OF SERVICE SENSITIVE LINES AND WELDS, THEIR PROGRAM FOR AUGMENTED INSERVICE INSPECTION, THEIR PROGRAM FOR IMPROVING THE WATER CHEMISTRY ENVIRONMENT AND INCORPORATION OF ADEQUATE LEAK DETECTION CAPABILITY. ALL LICENSEES HAVE RESPONDED AND THEIR REPLIES ARE BEING EVALUATED BY A TECHNICAL SUPPORT CONTRACTOR (INEL). INITIAL TER'S HAVE BEEN COMPLETED. IMPLEMENTATION HAS CURRENTLY RECEIVED ADDITIONAL ATTENTION AND PROMINENCE BECAUSE OF CONTINUED CRACKING EXPERIENCE. SEE MULTIPLANT ACTION ITEM B-05 IN NUREG-0748.	DICK CLARK 492-7162

# WEST., CE & B&W STEAM GENERATOR TUBE INTEGRITY (A-3, A-4, A-5)

AS OF WEEK ENDING AUGUST 17, 1984

KEY PERSONNEL		TASK REVIEWERS		SCHEDULED COMPLETION																					
<b>TASK MANAGER</b> J. STROSNIDER X36903  <i>Paul Novak to J. Strosnider</i>  <b>NRR ANALYST</b> JUDY BUTTS X24822		<table border="1"> <thead> <tr> <th>NAME</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>J. STROSNIDER</td> <td>MEBR/RES</td> </tr> <tr> <td>W. PASEDAG</td> <td>AEB/DSI</td> </tr> <tr> <td>C. PARSZEWSKI</td> <td>CEB/DE</td> </tr> </tbody> </table>		NAME	BRANCH	J. STROSNIDER	MEBR/RES	W. PASEDAG	AEB/DSI	C. PARSZEWSKI	CEB/DE	<table border="1"> <thead> <tr> <th>J. RAJAN</th> <th>MEB/DE</th> </tr> </thead> <tbody> <tr> <td>B. TUROVLIN</td> <td>CEB/DE</td> </tr> <tr> <td>F. ODAR</td> <td>ADB/RSR</td> </tr> <tr> <td>F. AKSTULEWICZ</td> <td>AEB/DSI</td> </tr> <tr> <td>L. FRANK</td> <td>MTEB/DE</td> </tr> </tbody> </table>		J. RAJAN	MEB/DE	B. TUROVLIN	CEB/DE	F. ODAR	ADB/RSR	F. AKSTULEWICZ	AEB/DSI	L. FRANK	MTEB/DE	<b>1978 ANNUAL REPORT</b> <u>Early 1980</u>  <b>CURRENT</b> <u>#Not Scheduled</u>	
NAME	BRANCH																								
J. STROSNIDER	MEBR/RES																								
W. PASEDAG	AEB/DSI																								
C. PARSZEWSKI	CEB/DE																								
J. RAJAN	MEB/DE																								
B. TUROVLIN	CEB/DE																								
F. ODAR	ADB/RSR																								
F. AKSTULEWICZ	AEB/DSI																								
L. FRANK	MTEB/DE																								
<b>• PROBLEM DESCRIPTION</b>  Pressurized water reactor steam generator tube integrity can be degraded by corrosion induced wastage, cracking, reduction in tube diameter (denting) and vibration induced fatigue cracks. The primary concern is the capability of degraded tubes to maintain their integrity during normal operation and under accident conditions (LOCA or a main steam line break) with adequate safety margins.  Westinghouse and Combustion Engineering steam generator tubes have suffered degradation due to wastage and stress corrosion cracking. Both types of degradation have been decreased by conversion from phosphate to an all-volatile secondary water treatment. Degradation due to denting which leads to primary side stress corrosion cracking continues to be a problem.  B&W's once-through steam generators (OTSG's) were relatively free of trouble prior to the first tube leak incident at Oconee Unit 3 in July, 1976. Since then, all three Oconee units have experienced tube leak incidents. The leaks at the Oconee units are the result of cracks of unknown origins propagated in the circumferential direction by flow induced vibration and have been limited to tubes located adjacent to the open tube inspection lane.  A second form of degradation characterized as an erosion-cavitation phenomena has been observed at Oconee and other B&W units.		<b>• RES INTERFACE INFORMATION</b>  A. RES has funded, at the request of NRR, a major confirmatory program at PNL. The activity of this program consists of tests to verify the burst and cyclic strengths of degraded steam generator tubes and the leak rate data. B. RES is funding a program addressing the factors which determine Inconel 600 susceptibility to stress corrosion cracking in primary water. Metal condition, chemistry, temperature, stress and environment will be considered.		<b>• TECHNICAL ASSISTANCE CONTRACTS</b>  The following technical assistance contracts are generic in nature and will be applicable to the three Category "A" Technical Activities (A-3, A-4, and A-5) related to PWR steam generators. A SANDIA - Provide statistical analysis of steam generator tube failures in operating reactors in order to establish the bases for the sampling plan for inservice inspection. Completed. B BNL - Provide necessary computer code and perform parametric evaluation of effects of tube failures concurrent with MSLB. Completed. C BNL - Provide technical consultation and assistance to review information in areas of water chemistry and corrosion analysis, stress and/or burst strength calculations. Completed. D PNL - Provide cost/benefit evaluation of ISI plans. Completed. E PNL - Evaluate environmental consequences of multiple tube failures concurrent with MSLB. Completed.		<b>• POTENTIAL PROBLEMS</b>  The ACRS letter dated October 18, 1983 stated that the proposals should be recommended industry actions and not new requirements.																			
		<b>• ACRS INTERFACE INFORMATION</b>  The current status of this program was discussed with the ACRS Metal Components Subcommittee on January 28, 1983 and September 12, 1983. A meeting with the full ACRS was held on October 13, 1983.		<table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td>2314</td> <td>PNL</td> <td>\$75,000</td> <td>\$75,000</td> </tr> <tr> <td>82315</td> <td>PNL</td> <td>\$95,000</td> <td>\$95,000</td> </tr> </tbody> </table>		FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	2314	PNL	\$75,000	\$75,000	82315	PNL	\$95,000	\$95,000	<b>• STATUS SUMMARY</b>  The NRC has formed a Task Force under the Division of Licensing to prepare its proposed requirements regarding steam generator tube integrity. These requirements will include new concerns resulting from the Gimne tube failure (such as loose parts in the secondary system and plant response to SG tube failures) and also corrosion related failure mechanisms. The recommendations prepared by the staff under USI A 3.4.5 were primarily concerned with corrosion mechanisms such as wastage and denting. Consequently, as discussed with the Commission on June 30, 1982, the requirements from the Commission program will be incorporated in the overall set of requirements being developed to address tube failures.  The proposed requirements were discussed with the Steam Generator Owners' Group on July 29, 1982. Comments from the group were received September 30, 1982.  Science Applications, Inc. performed a Value/Impact analysis of the recommendations and issued their final draft report on September 23, 1982. This report was sent to all PWR vendors and licensees for comment.  The report has been transmitted to CRGR and meetings were held on September 14, 1983 and October 24, 1983. An ACRS meeting was held on October 13, 1983. The Commission briefing was delayed pending resolution of a differing professional opinion. The briefing is now planned for the near future.							
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																						
2314	PNL	\$75,000	\$75,000																						
82315	PNL	\$95,000	\$95,000																						

# WEST., CE & B&W STEAM GENERATOR TUBE INTEGRITY (A-3, A-4, & A-5)



FINAL REPORT AND SCHEDULE SUPERCEDED BY TASK REPORT — SEE STATUS SUMMARY

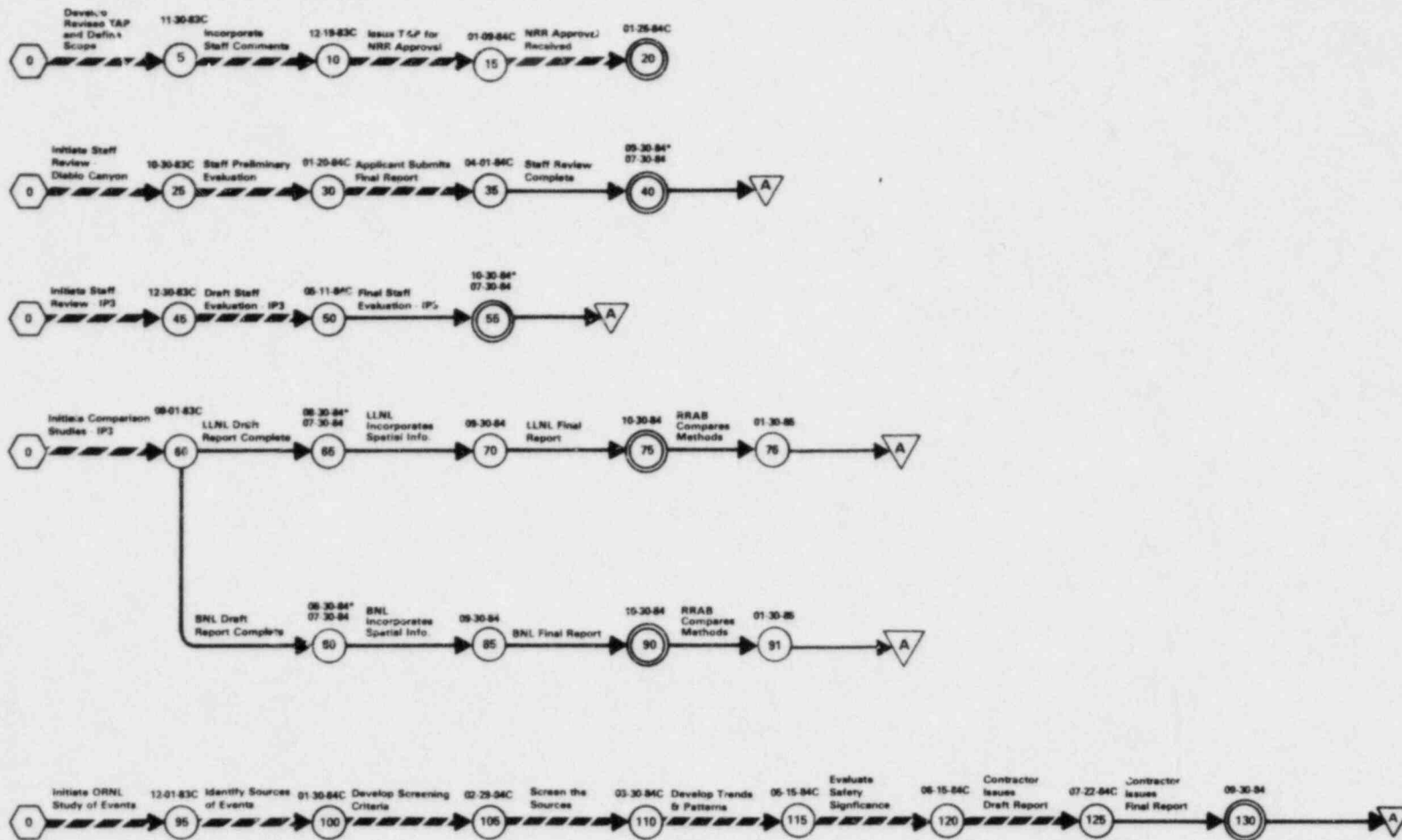


# SYSTEMS INTERACTIONS IN NUCLEAR POWER PLANTS (A-17)

AS OF WEEK ENDING AUGUST 17, 1984

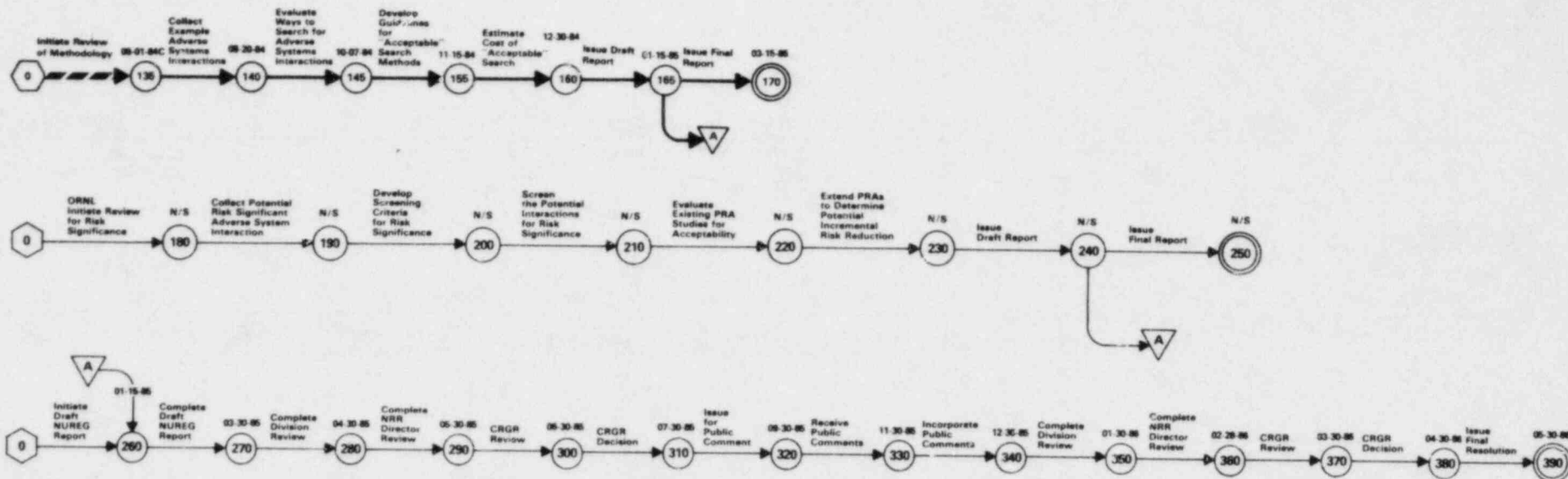
KEY PERSONNEL	TASK REVIEWERS	C. MORRIS RRAB/DST F. COFFMAN RRAB/DST	SCHEDULED COMPLETION
<p><b>TASK MANAGER</b> DALE THATCHER X29640</p> <p><i>Dale Thatcher</i></p> <p><b>NRR ANALYST</b> JUDY BUTTS X24822</p> <p><b>• PROBLEM DESCRIPTION</b></p> <p>The design of a nuclear power plant is accomplished by groups of engineers and scientists organized into engineering disciplines and into scientific disciplines. The reviews performed by the designers include interdisciplinary reviews to assure the functional compatibility of the plant structures, systems, and components. Safety reviews and accident analyses provide further assurance that system functional requirements will be met. These reviews include failure mode analyses.</p> <p>The NRC review and evaluation of safety systems is accomplished in accordance with the Standard Review Plan (SRP) which assigns primary and secondary review responsibilities to organizational units arranged by plant systems or by disciplines. Each element of the SRP is assigned to an organizational unit for primary responsibility and, where appropriate, to other units for secondary responsibilities.</p> <p>Thus, the design and analyses by the plant designers, and the subsequent review and evaluation by the NRC staff take into consideration the interdisciplinary areas of concern and account for systems interaction to a large extent. Furthermore, many of our regulatory criteria are aimed at controlling the risks from systems interactions. Examples include the single failure criterion and separation criteria.</p> <p>Nevertheless, there is some question regarding the interaction of various plant systems, both as to the supporting roles such systems play and as to the effect one system can have on other systems, particularly with regard to whether actions or consequences could adversely affect the presumed redundancy and independence of safety systems.</p> <p>The problem to be resolved by this task is to identify where the present design, analysis, and review procedures may not acceptably account for potentially adverse systems interaction and to recommend the regulatory action that should be taken.</p>	<p><b>NAME</b>                      <b>BRANCH</b></p> <p>E. CHELLIAH                      RRAB/DST</p> <p>D. LASHER                      RRAB/DST</p> <p><b>• RES INTERFACE INFORMATION</b></p> <p>The Division of Risk Analysis has been consulted during the development and execution of this plan.</p> <p><b>• ACRS INTERFACE INFORMATION</b></p> <p>A meeting with the combined ACRS Subcommittees on Reliability and Risk Assessment and Extreme External Phenomena was held on 03/13/83 to describe the status of the program.</p> <p>A meeting with the ACRS Subcommittee on Probabilistic Assessment was held on July 8, 1983. Subsequently, the ACRS wrote a letter critical of the staff program.</p> <p>A meeting was held on November 19, 1983 with the full committee for the purpose of discussing the revised staff program.</p>	<p><b>FIN NO.</b>   <b>CONTRACTOR</b>   <b>OBLIGATED</b>   <b>EXPENDED</b></p> <p># A-0445                      LLNL                      \$1,000K                      \$800K</p> <p># A-3725                      BNL                      \$1,000K                      \$850K</p> <p># B-0789                      ORNL                      \$ 330K                      \$210K</p> <p><b>• TECHNICAL ASSISTANCE CONTRACTS</b></p> <p>LLNL - LLNL is performing a systems interaction review of a portion of the Indian Point-3 plant using the Digraph Matrix method.</p> <p># BNL - BNL is performing a systems interaction review of a portion of the Indian Point-3 plant using Fault Tree combined with a Failure Mode and Effect Analysis.</p> <p># ORNL - ORNL reviewed a number of information sources (including LERs) to gather information on experienced and hypothesized system interaction events. From this information, an evaluation was made to establish trends and patterns among the events.</p>	<p><b>1978 ANNUAL REPORT</b>                      Phase I - 09-79</p> <p><b>CURRENT</b>                      #05-30-86</p> <p><b>• POTENTIAL PROBLEMS</b></p> <p><b>• STATUS SUMMARY</b></p> <p>Responsibility for resolution of USI A-17 was transferred to the Generic Issues Branch of the Division of Safety Technology in September 1983 and a full-time Task Manager was assigned. The Task Action Plan has subsequently been revised and has been approved by the Director, NRR. The ORNL draft report of this work was submitted to NRC for review. In addition, ORNL will be reviewing potential search methods for use in uncovering adverse systems interactions.</p>

# SYSTEMS INTERACTIONS IN NUCLEAR POWER PLANTS (A-17) Continued



\* Schedule Change This Report.

# SYSTEMS INTERACTIONS IN NUCLEAR POWER PLANTS (A-17) Continued



N/S = Not Scheduled  
 \* Schedule Change This Report

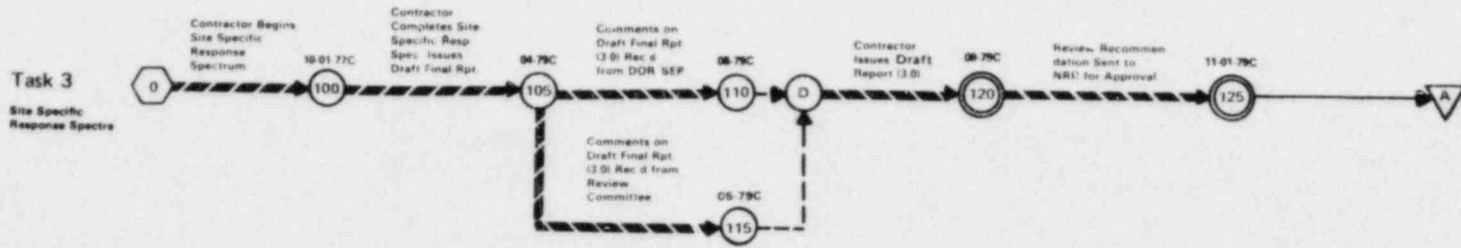
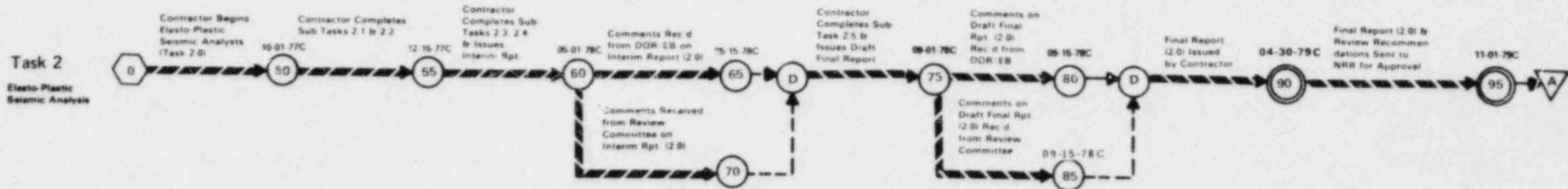
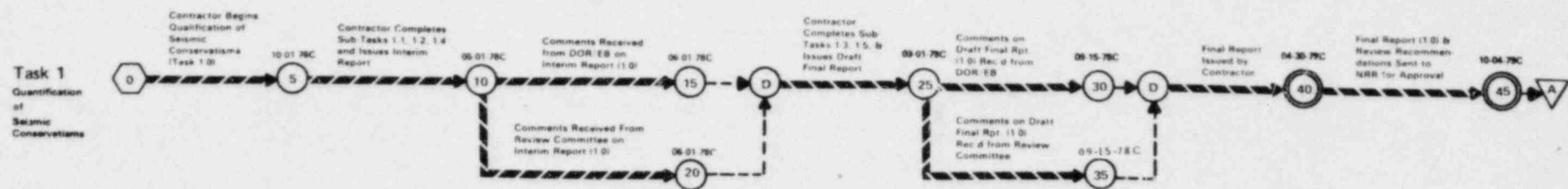
# SEISMIC DESIGN CRITERIA - SHORT TERM PROGRAM (A-40)

AS OF WEEK ENDING AUGUST 17, 1984

KEY PERSONNEL		TASK REVIEWERS		G. BAGCHI		EQB/DE		SCHEDULED COMPLETION							
TASK MANAGER		NAME		T. CHENG		SEP/DE		1978 ANNUAL REPORT							
SYED SHAUKAT X24216		BRANCH						PHASE I - 1979							
<i>Syed K. Shaikat</i>		N. CHOKSHI						PHASE II - 1981							
NRR ANALYST		L. REITER						CURRENT							
JUDY BUTTS X24822		P. SOBEL						# 07-01-85							
<p>• <b>PROBLEM DESCRIPTION</b></p> <p>The seismic design process required by current NRC criteria includes the following sequence of events:</p> <ol style="list-style-type: none"> <li>Define the magnitude or intensity of the earthquake which will produce the maximum vibratory ground motion at the site (the safe shutdown earthquake or SSE).</li> <li>Determine the free-field ground motion at the site that would result if the SSE occurred.</li> <li>Determine the motion of site structures by modifying the free-field motion to account for the interaction of the site structures with the underlying foundation soil.</li> <li>Determine the motion of the plant equipment supported by the site structures.</li> <li>Compare the seismic loads, in appropriate combination with other loads, on structures, systems, and components important to safety, with the allowable loads.</li> </ol> <p>While this seismic design sequence includes many conservative factors, certain aspects of the sequence may not be conservative for all plant sites. At present, it is believed that the overall sequence is adequately conservative. The objective of this program is to investigate selected areas of the seismic design sequence to determine their conservatism for all types of sites, to investigate alternate approaches to parts of the design sequence, to quantify the overall conservatism of the design sequence, and to modify the NRC criteria in the Standard Review Plan if changes are found to be justified. In this manner, this program will provide additional assurance that the health and safety of the public is protected, and if possible, reduce costly design conservatisms by improving (1) current seismic design requirements, (2) NRR's capability to quantitatively assess the overall adequacy of seismic design for nuclear plants in general.</p>		<p>• <b>RES INTERFACE INFORMATION</b></p> <p>None.</p>		<p>• <b>TECHNICAL ASSISTANCE CONTRACTS</b></p> <p>Lawrence Livermore National Laboratory (LLNL), under contract to RES, reviewed all reports by 04-30-79. LLNL report on recommendations for changes to the seismic design criteria was completed on 12-28-79. (NUREG/CR-1161).</p> <p>LLNL has performed the value/impact analysis on proposed requirements developed from the A-40 technical findings.</p>		<p>• <b>POTENTIAL PROBLEMS</b></p> <p>None.</p>									
		<p>• <b>ACRS INTERFACE INFORMATION</b></p> <p>None.</p>		<table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td>A-0441</td> <td>LLNL</td> <td>\$135 K</td> <td>\$135 K</td> </tr> </tbody> </table>		FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	A-0441	LLNL	\$135 K	\$135 K	<p>• <b>STATUS SUMMARY</b></p> <p># The CRGR package will be forwarded to the CRGR by August 20, 1984.</p>	
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED												
A-0441	LLNL	\$135 K	\$135 K												

# SEISMIC DESIGN CRITERIA - SHORT TERM PROGRAM (A-40)

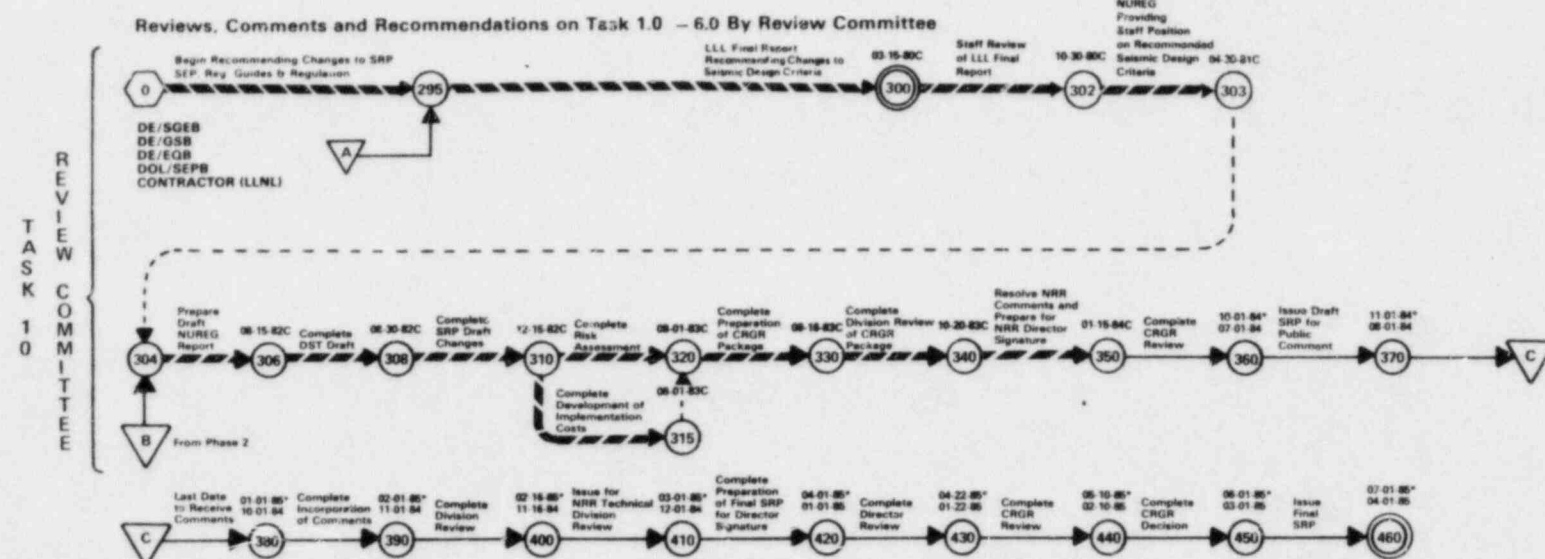
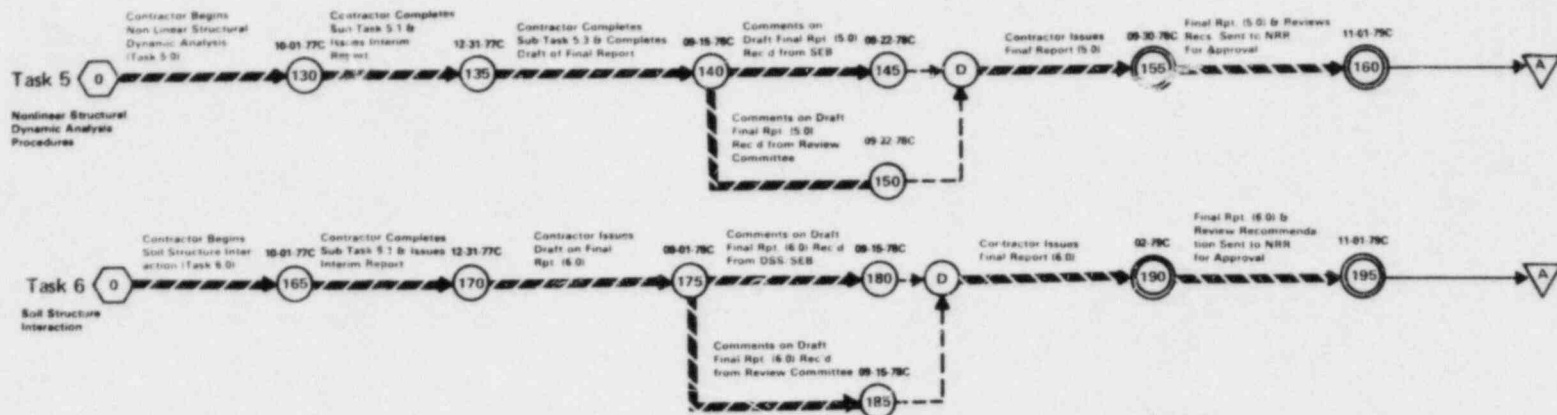
Phase 1



**Task 4 Deleted**  
Seismic After Shocks

# SEISMIC DESIGN CRITERIA - SHORT TERM PROGRAM (A-40) CONTINUED

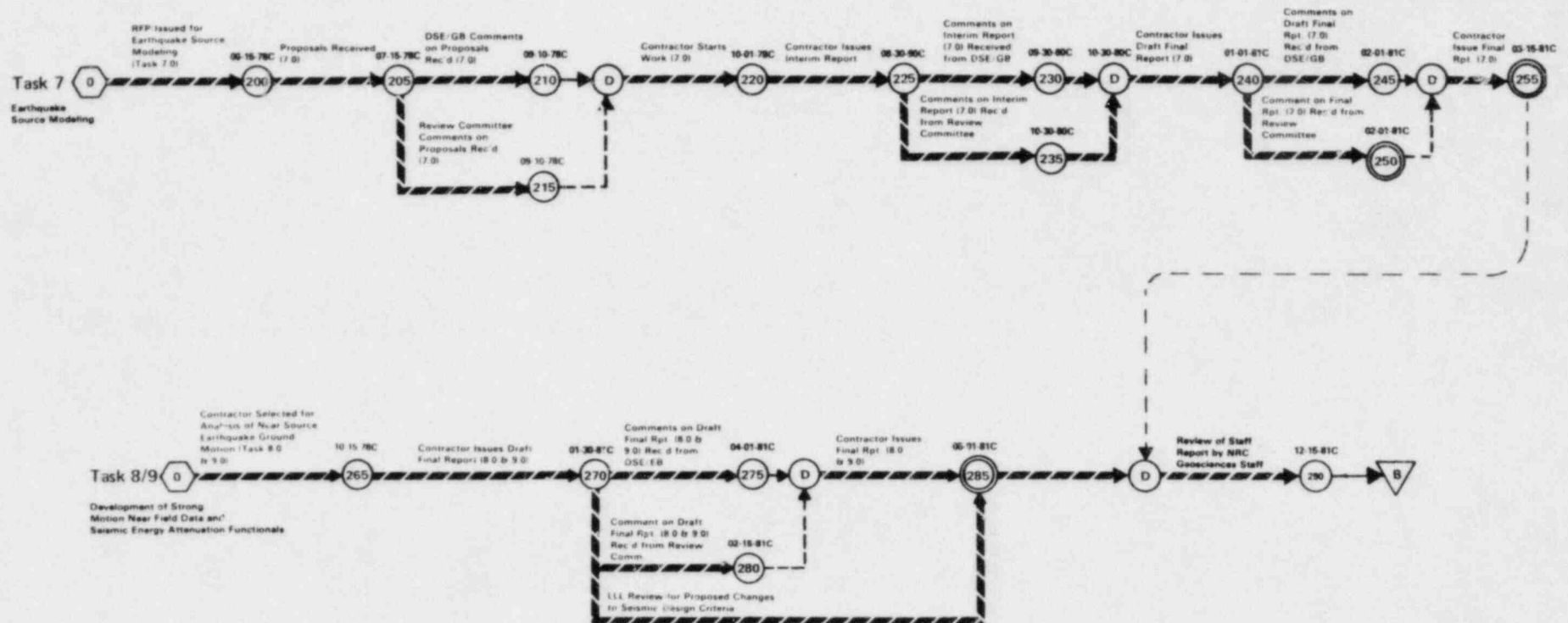
(Phase 1 Cont.)



\* Schedule Change This Report

Phase 2

# SEISMIC DESIGN CRITERIA - SHORT TERM PROGRAM (A-40) CONTINUED







# CONTAINMENT EMERGENCY SUMP PERFORMANCE (A-43)

NOTE: This sub-task 1 report is no longer necessary since the background presented therein has been summarized in NUREG-0897, Revision of USI A-43, "Containment Emergency Sump Performance," which is the final repair stage.

NOTE: Subtask 2 has been deleted since findings presented in this flow report are superseded by experimental results from Subtask 4.

SUBTASK 1  
SUMP RECIRCULATION  
TESTS REPORT

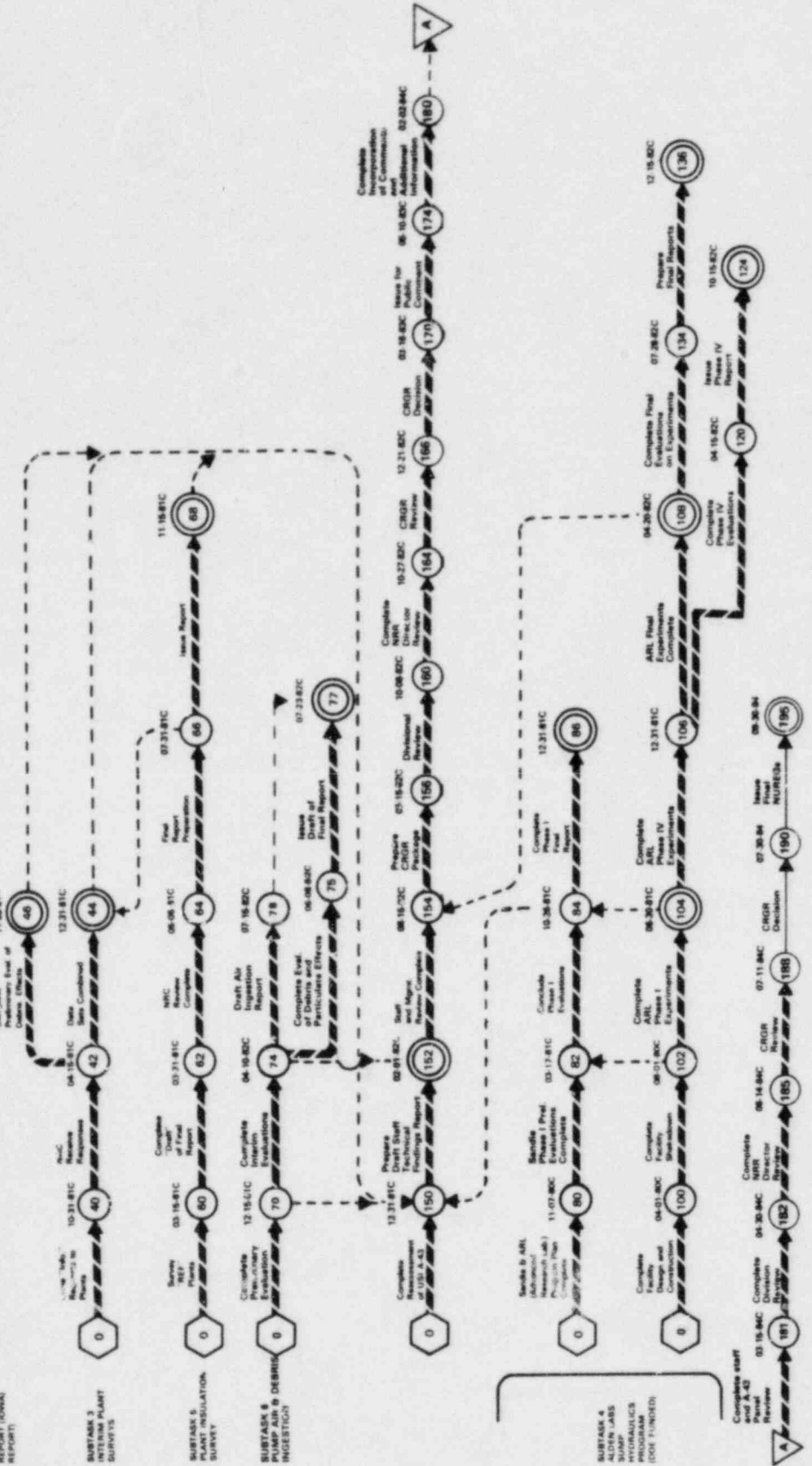
SUBTASK 2  
SWIRL VORTEX  
TESTS (FORMAL  
REPORT)

SUBTASK 3  
INTERIM PLANT  
SURVEYS

SUBTASK 5  
INSULATION  
SURVEY

SUBTASK 6  
PUMP AIR & DEBRIS  
INJECTION

SUBTASK 4  
ALPHA LABS  
HYDRAULICS  
SUMP  
(SEE HINDER)

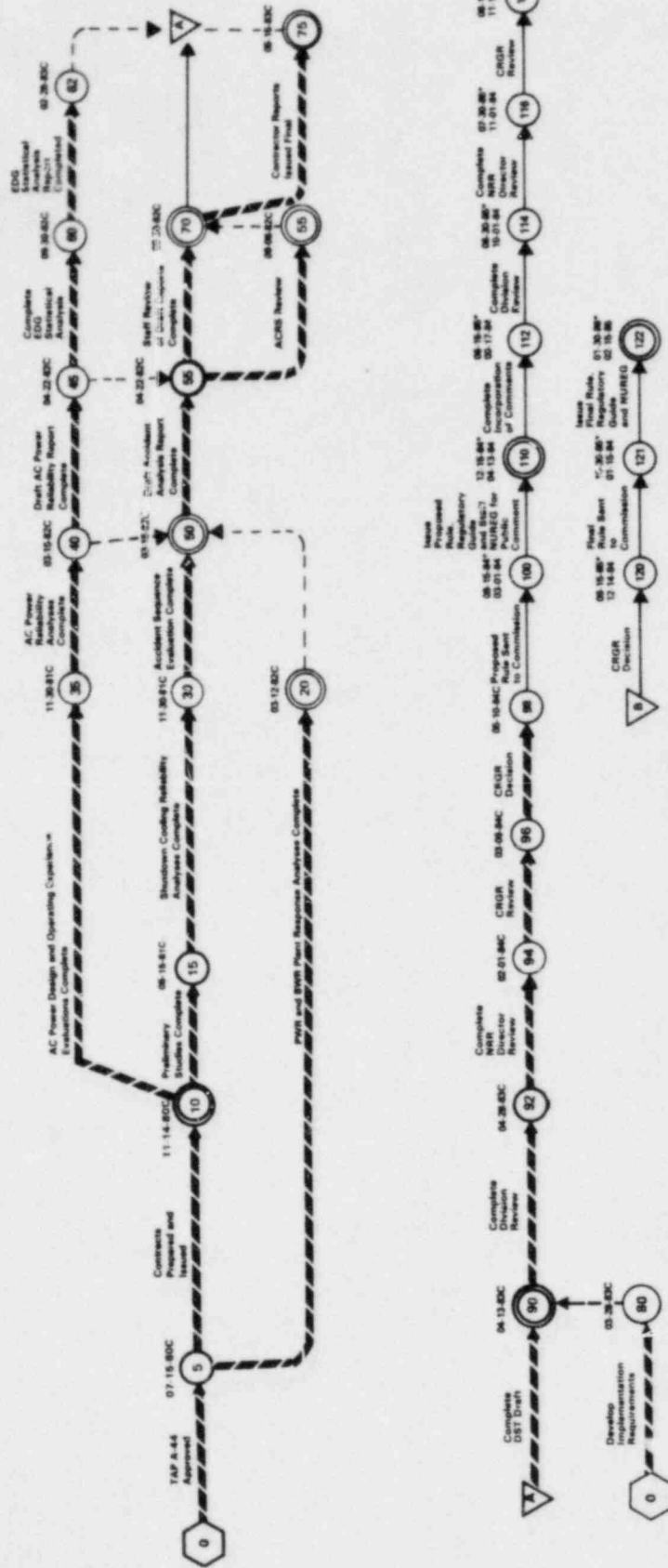


# STATION BLACKOUT (A-44)

AS OF WEEK ENDING AUGUST 17, 1984

KEY PERSONNEL		TASK REVIEWERS		D. LANGFORD		RSB/DSI		SCHEDULED COMPLETION													
TASK MANAGER		NAME		S. NEWBERRY		SRAB/DST		ORIGINAL	JUNE 1982												
NRR ANALYST		BRANCH						CURRENT	7 01 30 86												
ALAN RUBIN X28303 PAT BARANOWSKY X37632 <i>Alan Rubin</i> JUDY BUTTS X24822		R. ANAND ASB/DSI L. ENGLE ORB/DI O. CHOPRA PSB/DSI																			
<b>• PROBLEM DESCRIPTION</b> Electric power for safety systems at nuclear power plants is supplied by two redundant and independent divisions. Each of these electrical divisions includes an offsite alternating current (A.C.) source, an onsite A.C. source (usually diesel-generators), and a direct current (D.C.) source. Appendix A to 10 CFR 50 defines a total loss of offsite power as an anticipated occurrence, and as such, it is required that an independent emergency onsite power supply be provided at nuclear power plants.  The unlikely, but possible loss of A.C. power (that is, the loss of A.C. power from the offsite source and from the onsite source) is referred to as a station blackout. In the event of a station blackout, the capability to cool the reactor core would be dependent on the availability of systems which do not require A.C. power supplies, and on the ability to restore A.C. power in a timely manner. The concern is that the occurrence of a station blackout may be a relatively high probability event and that the consequences of this event may be unacceptable, for example, severe core damage may result.		<b>• RES INTERFACE INFORMATION</b> RES is providing technical assistance for the resolution of A-44.		<b>• TECHNICAL ASSISTANCE CONTRACTS</b> ORNL FIN 80744 \$760K - Evaluate expected frequency and duration of offsite (preferred) power losses at nuclear power plants. Estimate the reliability and evaluate the dominant factors affecting the reliability of emergency A.C. power supplies.  Perform statistical correlation and trend analysis of diesel generator data. NUREG/CR-2988, "Reliability of Emergency AC Power Systems at Nuclear Power Plants," was published in July 1983.  SNL FIN A1302 \$300K - Evaluate the risks posed by station blackout accidents and assess the effectiveness of safety improvements in reducing those risks.  Evaluate risk reduction and costs of various fixes and to provide input for value/impact analysis.  NUREG/CR-3228, "Station Blackout Accident Analyses (Part of NRC Task Action Plan A-44)," was published in May 1983.		<b>• POTENTIAL PROBLEMS</b>															
<b>• ACRS INTERFACE INFORMATION</b> Station Blackout is related to a number of ACRS concerns regarding the reliability of power systems. This task will be coordinated with the committee as the task progresses.  A presentation on staff recommendations to resolve USI A-44 was made to the ACRS Subcommittee on AC/DC Power Systems Reliability on May 10, 1983.  A presentation was made to the full ACRS on July 7, 1983.				<table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED*</th> </tr> </thead> <tbody> <tr> <td># 80744</td> <td>ORNL</td> <td>\$740K</td> <td>\$686K</td> </tr> <tr> <td>A1302</td> <td>SNL</td> <td>\$300K</td> <td>\$292K</td> </tr> </tbody> </table> # * As of May 31, 1984.		FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED*	# 80744	ORNL	\$740K	\$686K	A1302	SNL	\$300K	\$292K	<b>• STATUS SUMMARY</b> The staff's proposed recommendations to resolve A-44 based on the technical findings, were reviewed by NRR and RES divisions. This review resulted in the recommendation to proceed with proposed rulemaking, in conjunction with a new Regulatory Guide, to resolve A-44. The proposed technical resolution has been reviewed by the Director, NRR, and forwarded to CRGR. Meetings were held with CRGR in March and April 1984 to review the proposed resolution. CRGR recommended that the proposed rule, the proposed Regulatory Guide and the draft staff NUREG-1032 be issued for public comment after making modifications to reflect CRGR comments.			
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED*																		
# 80744	ORNL	\$740K	\$686K																		
A1302	SNL	\$300K	\$292K																		

# STATION BLACKOUT (A-44)



NOTE: Milestone 75—Accident Analysis Report and EDG Reliability Report were published in 1983. The Draft Loss of Offsite Power Report was published in July 1984.

\* Schedule Change This Report.

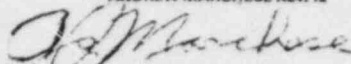
# SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS (A-45)

AS OF WEEK ENDING AUGUST 17, 1984

## KEY PERSONNEL

### TASK MANAGER

ANDREW MARCHESE X24712



### NRR ANALYST

JUDY BUTTS X24822

## TASK REVIEWERS

NAME BRANCH

T. MARSH RSB/DSI

F. ROSA ICSB/DSI

M. SRINIVASAN PSB/DSI

E. McPEEK SSPB/DL

D. DIANNI ORB 4/DL

M. CUNNINGHAM DRA/RES

R. FRAHM RRAB/DST

P. HEARN ASB/DSI

## SCHEDULED COMPLETION

ORIGINAL / 10-30-85

CURRENT / 02-28-86

## • PROBLEM DESCRIPTION

Task A-45 was approved as a USI by the NRC in December 1980.

Although many improvements to the steam generator auxiliary feedwater system were required of the reactor manufacturers by the NRC following the TMI-2 accident, the staff feels that providing an alternative means of decay heat removal could substantially increase the plants' capability to deal with a broader spectrum of transients and accidents and potentially could, therefore, significantly reduce the overall risk to the public. Consequently, Task A-45 will investigate alternative means of decay heat removal in PWR plants, including but not limited to using existing equipment where possible. This Unresolved Safety Issue will also investigate the need and possible design requirements for improving reliability of decay heat removal systems in boiling water reactors (BWRs).

The overall purpose of Task A-45 is to evaluate the adequacy of current licensing design requirements, in order to ensure that nuclear power plants do not pose an unacceptable risk due to failure to remove shut-down decay heat. The objective will be to develop a comprehensive and consistent set of shutdown cooling requirements for existing and future LWRs, including the study of alternative means of shutdown decay heat removal and of diverse "dedicated" systems for this purpose.

The main objectives of the program are as follows:

- Determine the safety adequacy of decay heat removal systems in existing power plants for achieving both hot shutdown and cold shutdown conditions.
- Evaluate the feasibility of alternative measures for improving decay heat removal systems, including diverse alternatives dedicated to the decay heat removal function.
- Assess the value and impact of the most promising alternative measures.
- Develop a plan for implementing any new licensing requirements for decay heat removal systems.

The interrelation and relative timing of each of the program sub-tasks are shown on the schedule network.

## • RES INTERFACE INFORMATION

Close coordination and cooperation will be required on Task A-45 between NRR and RES. RES assistance will be required from the Divisions of Risk Analysis and Accident Evaluation. The Division of Risk Analysis will provide technical input from their Sandia Laboratory Program on Alternate Decay Heat Removal Concepts, technical evaluations relative to reliability and risk assessment for shutdown decay heat removal systems, and input from Task A-44, "Station Blackout," relative to shutdown cooling systems. The Division of Accident Evaluation will provide technical input relative to the transient response of existing and improved shutdown decay heat removal systems to transient events and small LOCA's. This will also include performing (in-house, contractors) detailed thermal-hydraulics analysis where required to support existing and improved decay heat removal systems behavior under transient and accident conditions.

## • ACRS INTERFACE INFORMATION

- Task Manager briefed the full committee on August 9, 1984 on the overall status of USI A-45.

- ACRS Subcommittee on Decay Heat Removal Systems (DHRS) met on June 5, 1984, and Task Manager provided the subcommittee with an update of the USI A-45 program.

- Further meetings with the full committee and subcommittee on DHRS will be held as the work on USI A-45 progresses and certain pre-determined milestones are completed.

## • TECHNICAL ASSISTANCE CONTRACTS

- Implemented a technical assistance contract on August 5, 1981 with BNL (FIN-A-3381) for \$100K to make a determination whether it is feasible to separate all currently operating U.S. commercial LWR's into groups based on whether they have similar DHRS design characteristics to the plants covered in WASH-1400, RSSMAP, and IREP. A contractor report, NUREG/CR-3713, was published in June 1984.

- Implemented a technical assistance contract on May 10, 1982 with Sandia (FIN A1309) to provide overall project management, technical direction and integration for the entire Task A-45 program, including selection and management of subcontractors.

## • POTENTIAL PROBLEMS

- Potential problem areas identified to date are:
  - Obtaining sufficient NRR manpower to work on Task A-45.
  - Development of appropriate reliability or quantitative goals for Task A-45 and translation of probabilistic results into licensing requirements.
  - Program funding must be approved and obtained.
  - Obtaining necessary operating experience on shutdown cooling systems including the most current DHRS system design information resulting from Post-TMI changes.
  - Uncertainty in the quality of information that will be available from ongoing reliability and risk assessments, on what schedule, and whether information can be extrapolated to all operating plants.
  - Number of plants that need to be assessed may be significantly greater than the plants that will have a PRA or reliability study performed because of significant design variation in the systems used for the decay heat removal function.
  - Arranging for plant visits in connection with A-45 assessments may take longer than originally scheduled.

## • STATUS SUMMARY

- Revision 3 of TAP A-45 was issued in March 1984 and approved by the Director, NRR, on July 24, 1984.

- In a memorandum to the Director, NRR, dated April 13, 1984, DST requested a 4-month schedule slip in the USI A-45 program. Subsequently, on May 14, 1984, the Director, NRR approved the 4-month schedule slip.

- Establishment of the A-45 Industry Peer Review Group is completed. All four NSS vendors and each of the owners groups are participating. The first meeting was held on June 12, 1984.

The ninth contractor interim draft milestone report entitled, "Characterization of Decay Heat Removal Systems of Operating and Soon-to-be Operating Light Water Reactors," has been issued for staff comment. A revised version of an earlier contractor milestone report entitled, "Potential Benefits Obtained by Requiring Safety Grade Cold Shutdown Systems," has been issued for another staff review because of the importance of the subject matter.

## FIN NO. CONTRACTOR OBLIGATED EXPENDED

FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED
R6635	UCLA	\$ 10,000	\$ 10,000
A1381	BNL	\$ 100,000	\$ 100,000
#A1309	Sandia	\$3,994,000	\$3,115,000

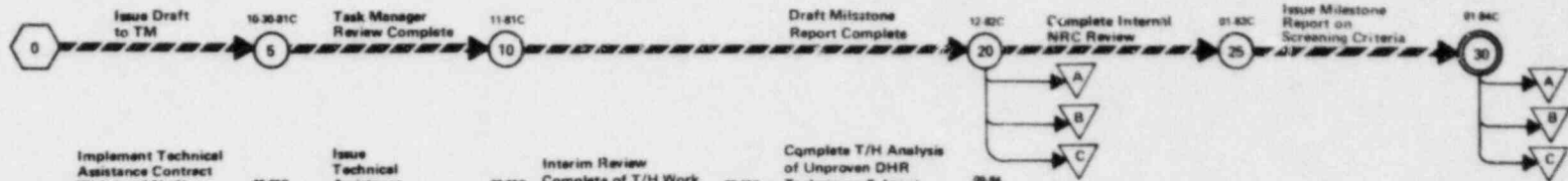
\* Includes the following funding which has been committed to support subcontracting:

UCLA	\$226,000
ORNL	\$471,000
BGR	\$ 32,000
LANL	\$107,000
ASAI	\$100,000
SAI/SEA	\$ 56,000
AE Support	\$380,000
DHR Tech Support	\$108,000

# SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS (A-45)

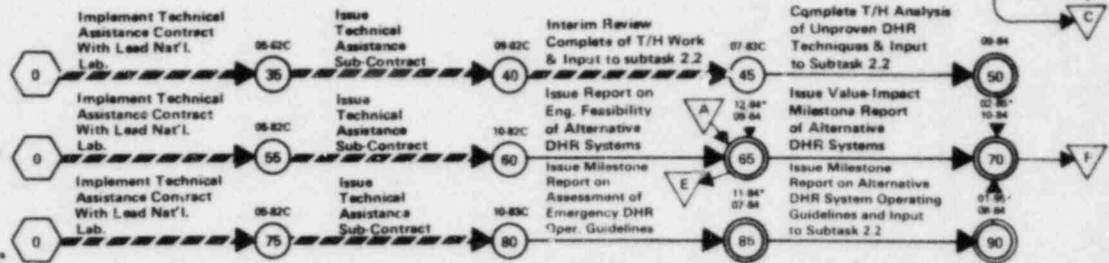
## TASK 1. DEVELOP SCREENING CRITERIA FOR DHRS

- Subtask 1.1 Existing Plants
- Subtask 1.2 Future Plants
- Subtask 1.3 Dev. Qualitative Criteria for "Special Emergencies"



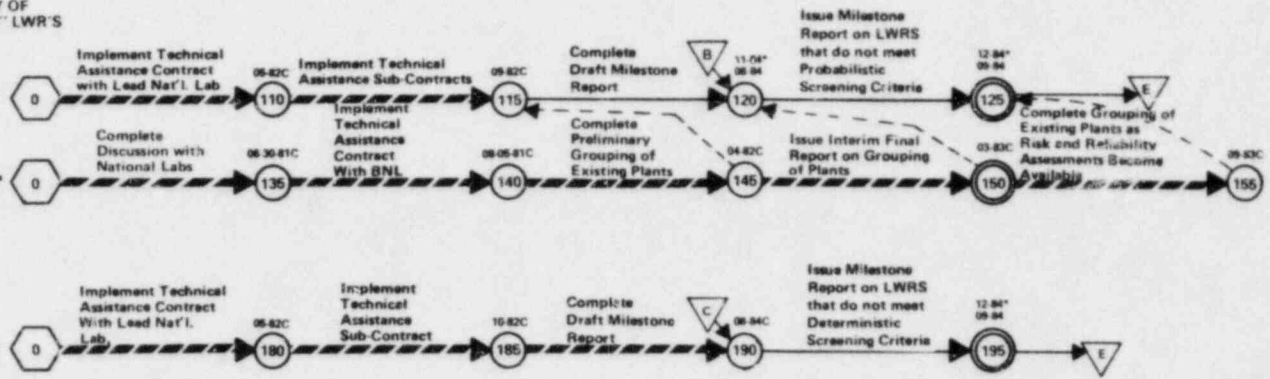
## TASK 2. DEV MEANS FOR IMPROVEMENT OF DHRS

- Subtask 2.1 Phenomenological Studies
- Subtask 2.2 Conceptual Design Studies
- Subtask 2.3 Operational Aspects of Alternative DHR Systems



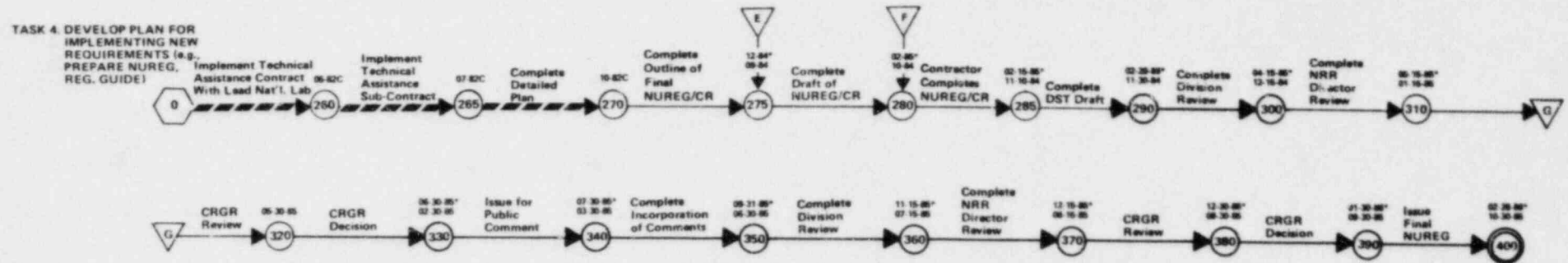
## TASK 3. ASSESS ADEQUACY OF DHRS IN "EXISTING" LWR'S

- Subtask 3.2 Assess Adequacy of DHRS in Existing Plants on Probabilistic Basis
- Subtask 3.3 Group Other Existing Plants for Assessments of Adequacy of DHRS
- Subtask 3.5 Assess Adequacy of DHRS in Existing Plants on Deterministic Basis



\* Schedule Change This Report

# SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS (A-45) CONTINUED



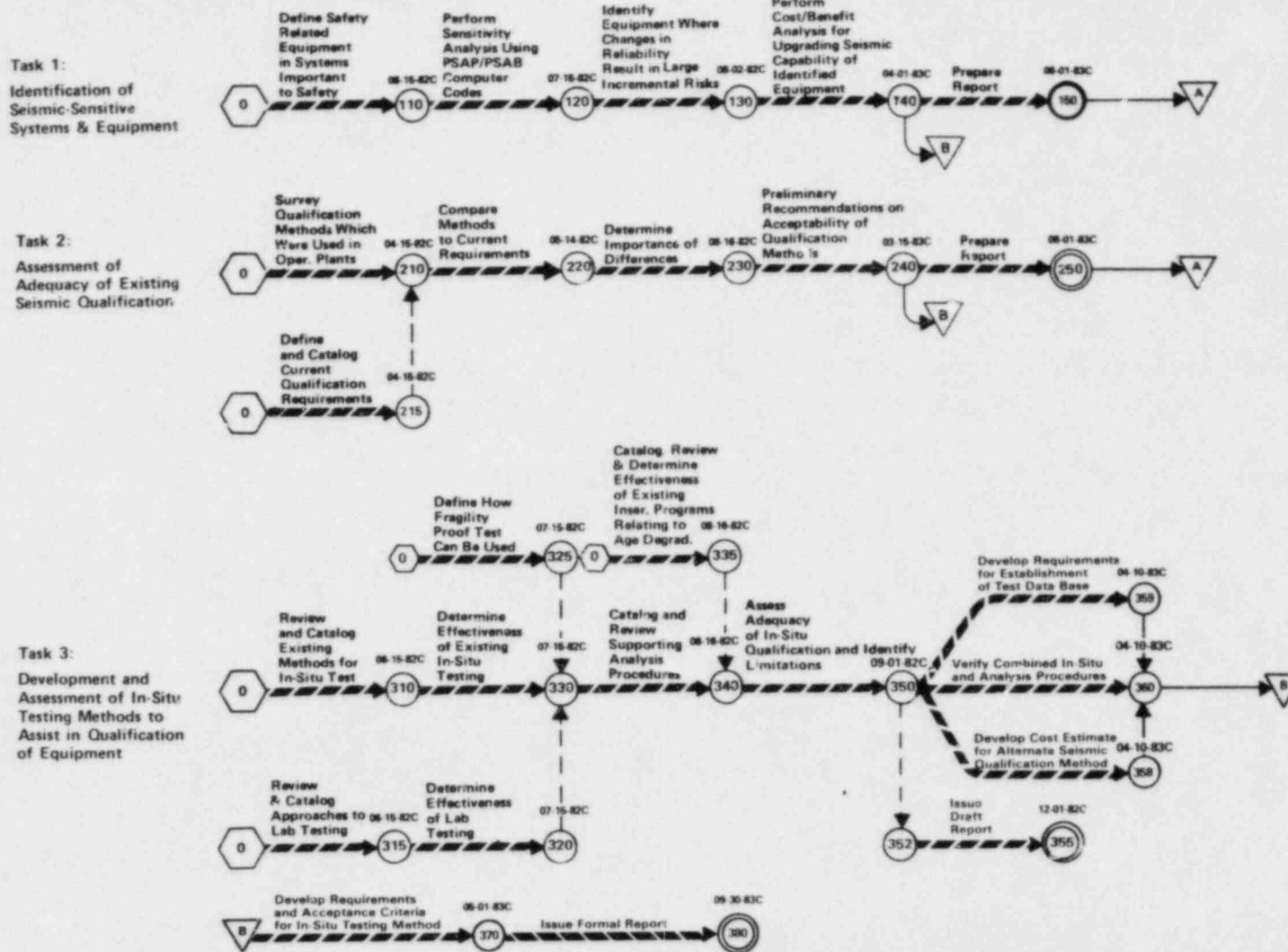
\* Schedule Change This Report.

# SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS (A-46)

AS OF WEEK ENDING AUGUST 17, 1984

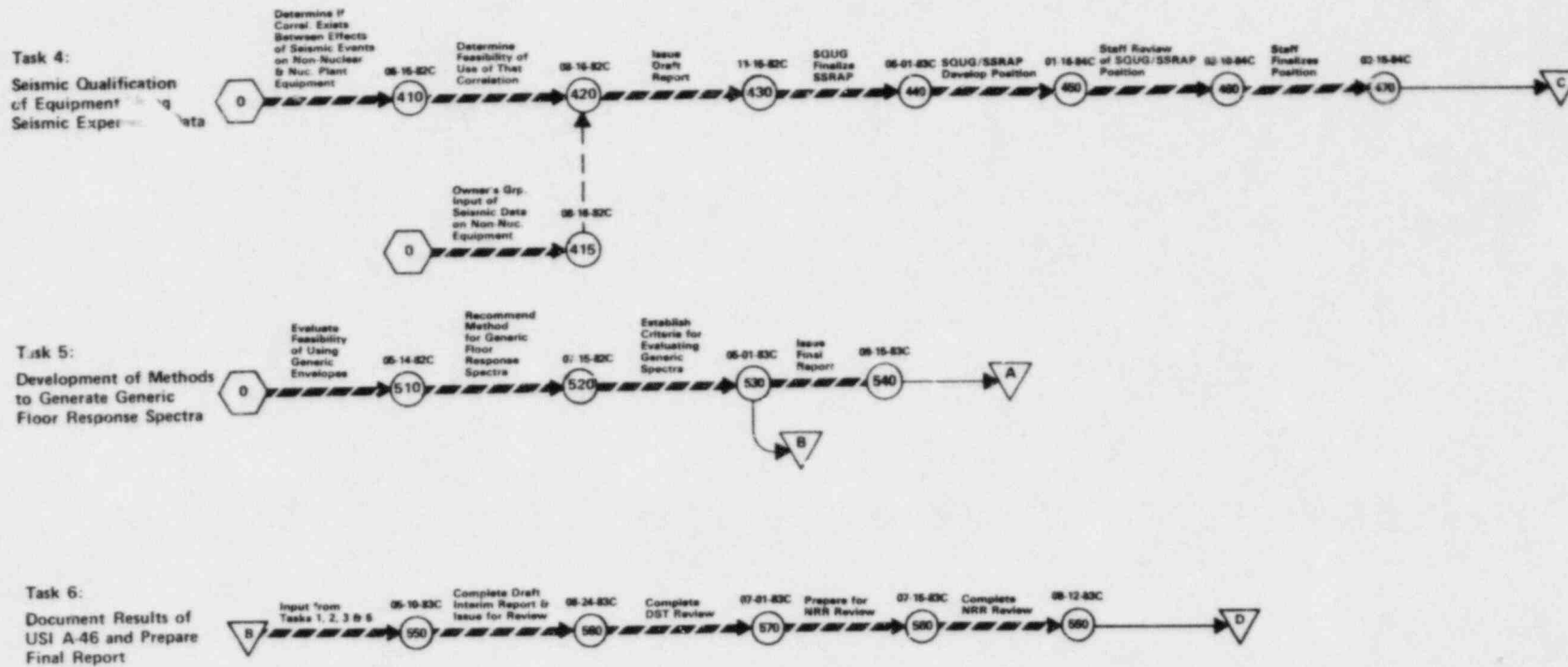
KEY PERSONNEL		TASK REVIEWERS		FRANK SKOPEC		RAB/DSI		SCHEDULED COMPLETION													
TASK MANAGER		NAME	BRANCH	KULIN DESAI	RSB/DSI																
T. Y. CHANG XZ7486				HAROLD POLK	SGEB/DE		ORIGINAL	12-15-83													
<i>T. Y. Chang</i>		ARNOLD LEE	EOB/DE	GUSTAAF GIESE-KOCH	GSB/DE		CURRENT	7-05-85													
NRR ANALYST		PEI-YING CHEN	SEP8/DL	GERALD WEIDENHAMER	MSEB/RES																
JUDY BUTTS XZ4822		JOHN KNOX	PSB/DSI																		
<p>• <b>PROBLEM DESCRIPTION</b></p> <p>Task A-46 was approved as a USI by the NRC December, 1980.</p> <p>The design criteria and methods for the seismic qualification of mechanical and electrical equipment in nuclear power plants have undergone significant change during the course of the commercial nuclear power program. Consequently, the margins of safety provided in existing equipment to resist seismically induced loads and perform the intended safety functions may vary considerably. The seismic qualification of the equipment in operating plants must, therefore, be reassessed to ensure the ability to bring the plant to a safe shutdown condition when subject to a seismic event. The objective of this Unresolved Safety Issue is to establish an explicit set of guidelines that could be used to judge the adequacy of the seismic qualification of mechanical and electrical equipment at all operating plants in lieu of attempting to backfit current design criteria for new plants. This guidance will concern equipment required to safely shutdown the plant, as well as equipment whose function is not required for safe shutdown, but whose failure could result in adverse conditions which might impair shutdown functions. Also, explicit guidelines will be established for use in requalifying equipment whose seismic qualification was found to be inadequate.</p> <p>A breakdown of the tasks is as follows:</p> <table border="1"> <tr> <td>Task 1</td> <td>Identification of Seismic Sensitive Systems and Equipment</td> </tr> <tr> <td>Task 2</td> <td>Assessment of Adequacy of Existing Seismic Qualification</td> </tr> <tr> <td>Task 3</td> <td>Development and Assessment of In-Situ Testing Methods to Assist in Qualification of Equipment</td> </tr> <tr> <td>Task 4</td> <td>Seismic Qualification of Equipment Using Seismic Experience Data</td> </tr> <tr> <td>Task 5</td> <td>Development of Methods to Generate Generic Floor Response Spectra</td> </tr> <tr> <td>Task 6</td> <td>Document Results of USI A-46 and Prepare Final Report</td> </tr> </table>		Task 1	Identification of Seismic Sensitive Systems and Equipment	Task 2	Assessment of Adequacy of Existing Seismic Qualification	Task 3	Development and Assessment of In-Situ Testing Methods to Assist in Qualification of Equipment	Task 4	Seismic Qualification of Equipment Using Seismic Experience Data	Task 5	Development of Methods to Generate Generic Floor Response Spectra	Task 6	Document Results of USI A-46 and Prepare Final Report	<p>• <b>RES INTERFACE INFORMATION</b></p> <p>Part of a RES contract with Southwest Research Institute (SWRI) is concerned with developing methodology to correlate various seismic qualification tests and is designated Task 2 for A-46. This work is essentially complete. SWRI issued related reports in June and November 1983.</p>		<p>• <b>TECHNICAL ASSISTANCE CONTRACTS</b></p> <p>Tasks 1 and 5 were performed by Brookhaven National Laboratory and are essentially complete. NUREG/CR-3267 on Task 1 was issued in June 1983. NUREG/CR-3286 on Task 5 was issued in September 1983. A draft guideline on Task 1 was issued in September 1983.</p> <p>Task 3 was performed by Idaho National Engineering Laboratory and is now complete. NUREG/CR-3075 on Task 3 was issued in June 1984.</p> <p>Task 4 has been studied independently by Lawrence Livermore National Laboratory (LLNL) and by the Seismic Qualification Utility Group (SQUG). Results of the LLNL study were published in NUREG/CR-3017 dated August 1983.</p>		<p>• <b>POTENTIAL PROBLEMS</b></p> <p>None</p>			
Task 1	Identification of Seismic Sensitive Systems and Equipment																				
Task 2	Assessment of Adequacy of Existing Seismic Qualification																				
Task 3	Development and Assessment of In-Situ Testing Methods to Assist in Qualification of Equipment																				
Task 4	Seismic Qualification of Equipment Using Seismic Experience Data																				
Task 5	Development of Methods to Generate Generic Floor Response Spectra																				
Task 6	Document Results of USI A-46 and Prepare Final Report																				
<p>• <b>ACRS INTERFACE INFORMATION</b></p> <p>The status of A-46 was presented to the ACRS Subcommittee in March 1983. In March and July 1983, respectively, the Seismic Qualification Utility Group (SQUG) also made two separate presentations to the ACRS Subcommittee and Full Committee on their pilot program to establish the feasibility of using seismic experience data in conventional power plants to demonstrate the adequacy of similar equipment installed in operating nuclear power plants. The ACRS, in their comments, indicated that the SQUG approach was in line with the ACRS recommendations made in January 1983 and should be encouraged. However, ACRS believes that more work is required to establish the operability of equipment during and after an earthquake, and more data will be required to support conclusions drawn concerning the seismic resistance of the equipment investigated. The status of A-46 was presented to the ACRS Subcommittee again in March and April 1984, and to the ACRS Full Committee in May 1984.</p>		<p>• <b>STATUS SUMMARY</b></p> <p>Work on all tasks is essentially completed by the contractors with the exception of Task 4. The SQUG formed an independent Senior Seismic Review and Advisory Panel (SSRAP) in June 1983 to make recommendations for use of seismic experience data. The NRC staff has been working very closely with the SQUG and the SSRAP and will continue to do so. This activity is an important element in the resolution of A-46. The A-46 schedule was approved by NRC management on July 18, 1983. SSRAP issued its report in February 1984.</p> <p>The USI A-46 CRGR package (including NUREG-1030) was issued in March 1984 for NRR and RES staff review and comments. It will be forwarded to the Director of NRR for review and approval in September 1984.</p>																			
		<table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td>A0423</td> <td>LLNL</td> <td>\$75K</td> <td>\$75K</td> </tr> <tr> <td># A6721</td> <td>INEL</td> <td>\$285K</td> <td>\$283K (est)</td> </tr> <tr> <td>A-3287</td> <td>BNL</td> <td>\$324K</td> <td>\$320K</td> </tr> </tbody> </table>		FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	A0423	LLNL	\$75K	\$75K	# A6721	INEL	\$285K	\$283K (est)	A-3287	BNL	\$324K	\$320K		
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																		
A0423	LLNL	\$75K	\$75K																		
# A6721	INEL	\$285K	\$283K (est)																		
A-3287	BNL	\$324K	\$320K																		

# SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS (A-46)



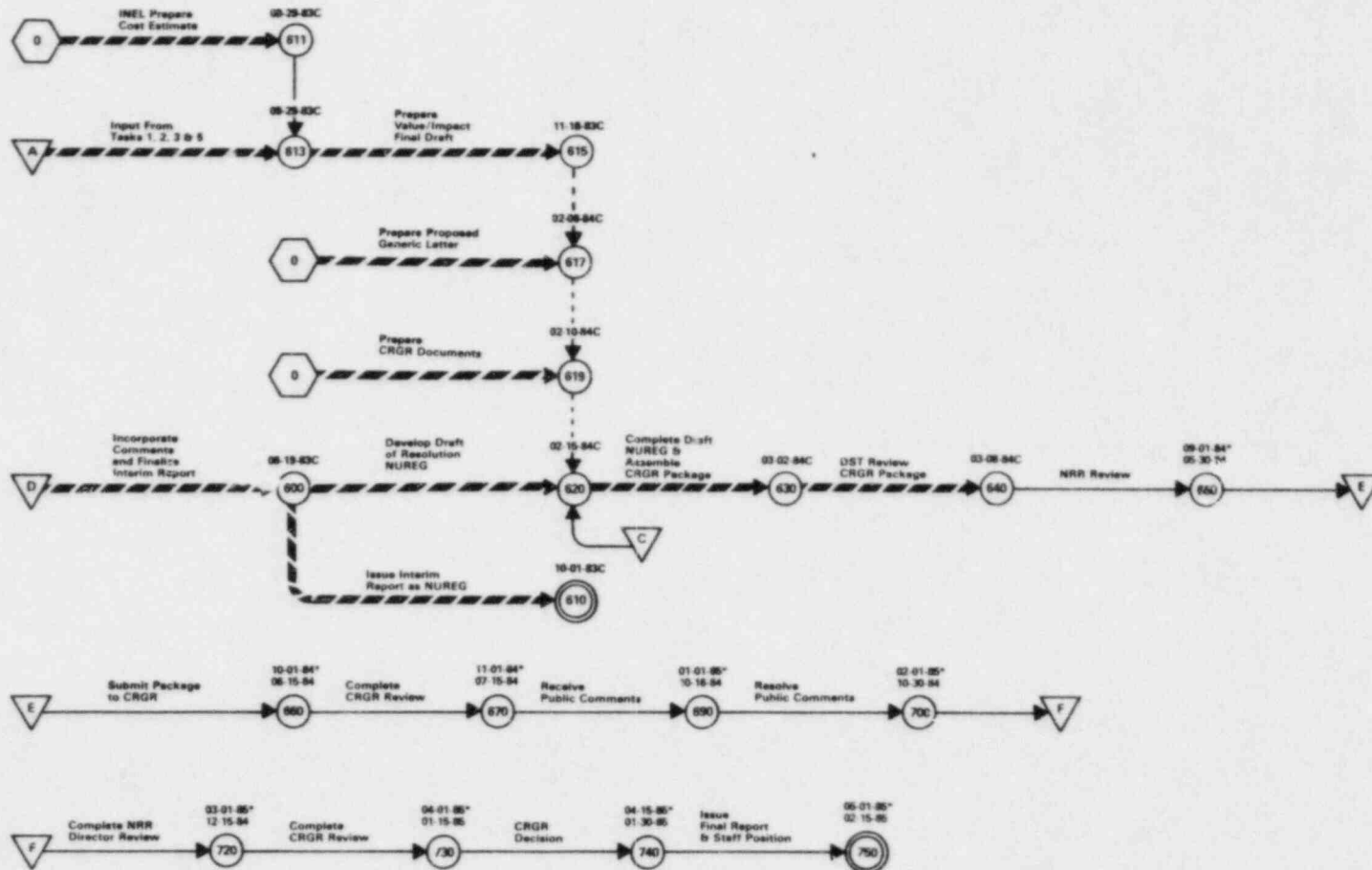


# SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS (A-46) CONTINUED



# SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS (A-46) CONTINUED

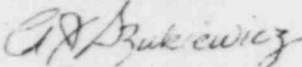
Task 6  
(Continued)



\* Schedule Change This Report.

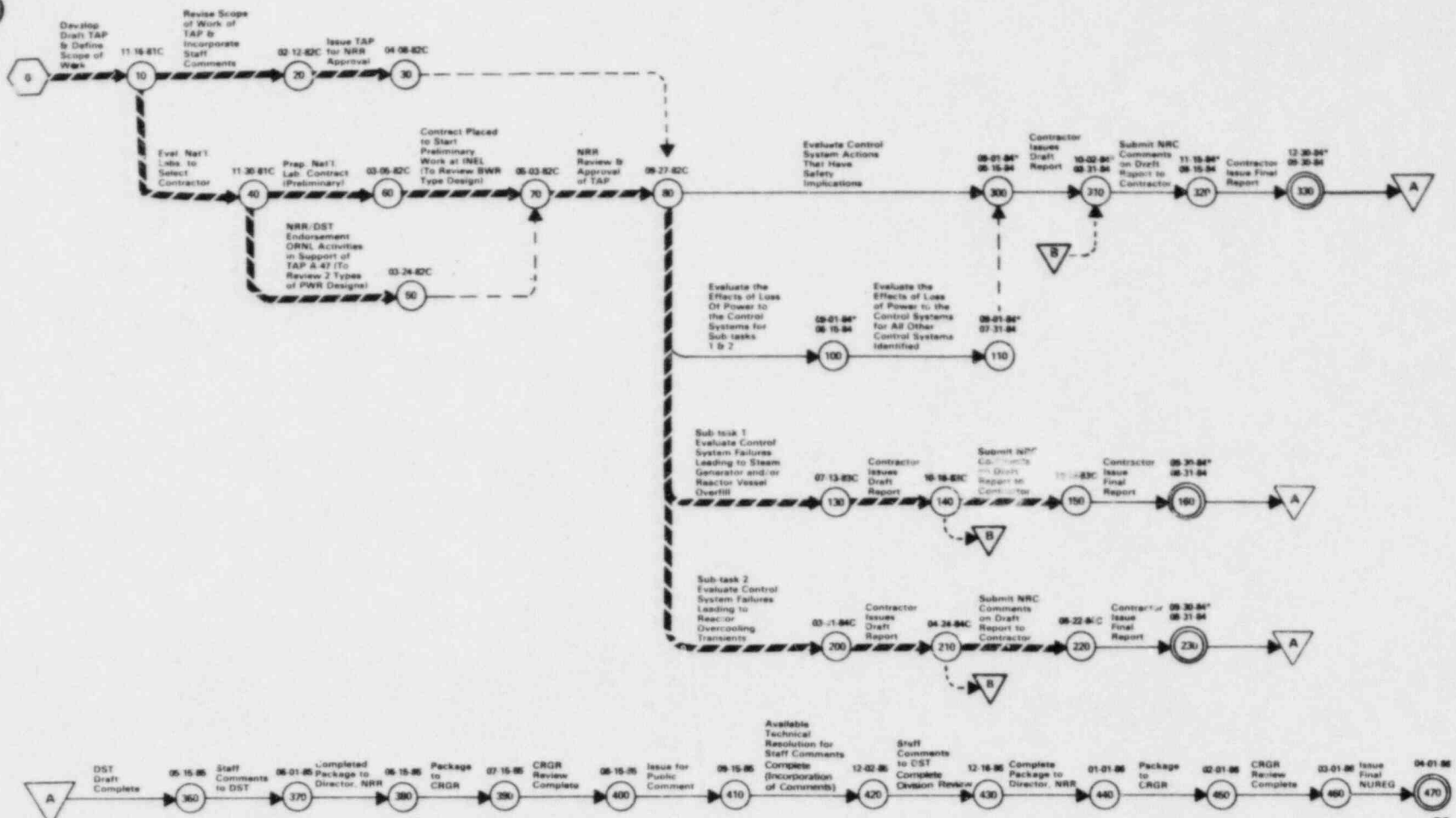
# SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47)

AS OF WEEK ENDING AUGUST 17, 1984

KEY PERSONNEL		TASK REVIEWERS		S. DIAB	RSB/DSI	SCHEDULED COMPLETION													
<b>TASK MANAGER</b> ANDREW SZUKIEWICZ X24713  <b>NRR ANALYST</b> JUDY BUTTS X24822		<b>NAME</b> <b>BRANCH</b>		M. CHIRAMAL	PSU/AEOD	ORIGINAL	01-30-86												
		D. BASDEKAS                  DFO/RES		J. T. BEARD	ORAB/DL	CURRENT	04-01-86												
		J. CALVO                          ICSB/DSI		W. KENNEDY	PTRB/DHFS														
		E. CHELLIAH                      RRAB/DST																	
<b>• PROBLEM DESCRIPTION</b> Task A-47 was approved as a USI by the NRC in December 1980. This issue concerns the potential for accidents or transients being made more severe as a result of control system failures or malfunctions. These failures or malfunctions may occur independently or as a result of the accident or transient under consideration and would be in addition to any control system failure that may have initiated the event. Although it is generally believed that control system failures are not likely to result in loss of safety functions which could lead to serious events or result in conditions that safety systems are not able to cope with, in-depth studies have not been performed to support this belief. The potential for an accident that would affect a particular control system and the effects of the control system failures will differ from plant to plant. Therefore, it is not likely that it will be possible to develop generic answers to these concerns, but rather plant-specific reviews will be required. The purpose of this Unresolved Safety Issue is to define generic criteria that may be used for plant-specific reviews. A specific subtask of this issue will be to study the steam generator overfill transient in PWRs and the reactor overfill transient in BWRs to determine and define the need for preventive and/or mitigating design measures to accommodate this transient.		<b>• RES INTERFACE INFORMATION</b> Close coordination will be required on Task A-47 between NRR and RES. RES assistance will be required from the Division of Facilities Operations and the Division of Risk Analysis. The Division of Facilities Operations will provide input from their research programs (currently being developed in conjunction with A-47) on control system interactions. The Division of Risk Analysis will provide input on their current on-going ORNL program ("Evaluation of Pressurized Thermal Shock"). Other research activities are being evaluated to determine their significance to A-47 and may be identified later.		<b>• TECHNICAL ASSISTANCE CONTRACTS</b> During the week of July 20, 1981, meetings were held with INEL, EG&G (Idaho Falls), Battelle Northwest and Lawrence Livermore Labs. for the purpose of discussing the A-47 objectives and to assess the type of activities that could best be conducted by these organizations. Similar meetings with ORNL and Sandia Labs were held July 9, 1981. A Technical Assistance (T.A.) contract with ORNL (FIN B-0467) was established through NRR/RES. RES will conduct a review of two different types of PWR designs (one B&W plant, Oconee, and one CE plant, Calvert Cliffs), and perform the activities identified in Tasks 1, 2, 3 and 4 of Task Action Plan A-47. A separate T.A. contract to perform the review on one BWR type design, Browns Ferry, and one PWR type design, (Westinghouse) H. B. Robinson, was established with INEL (FIN A-6477). The technical assistance contracts will perform the following tasks:		<b>• POTENTIAL PROBLEMS</b> Obtain necessary operating experience information on Non-Safety Control Systems for the Nuclear Steam System (NSS) and the Balance of Plant (BOP) systems. Obtain necessary design information (i.e., schematics and systems descriptions) for the Non-Safety Control System designs for the NSS and the BOP designs. Traditionally, licenses were not required to provide design or operating experience on Non-Safety Systems and therefore this information may be difficult to obtain. Availability of the BGE simulator for the Calvert Cliffs-1 evaluation is rescheduled to begin in March 1985.													
		<b>• ACRS INTERFACE INFORMATION</b> The ACRS Subcommittee on Electrical Power Systems (Dr. Kerr) met on the issue on 1/23/81 to initiate an approximate six month study at the request of Chairman Ahearne. Elements of conceptual Task Action Plan were discussed with ACRS on 05-07-81. Status of the activities identified in TAP A-47 was discussed with the ACRS Subcommittee on December 21, 1982 and November 16, 1983.		<table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED*</th> <th>EXPENDED**</th> </tr> </thead> <tbody> <tr> <td># A-6477</td> <td>INEL</td> <td>\$1,385,000</td> <td>\$1,335,000</td> </tr> <tr> <td># B-0467 and B-0616</td> <td>ORNL</td> <td>\$3,860,000</td> <td>\$2,960,000</td> </tr> </tbody> </table> * through FY 84 ** through June 1984		FIN NO.	CONTRACTOR	OBLIGATED*	EXPENDED**	# A-6477	INEL	\$1,385,000	\$1,335,000	# B-0467 and B-0616	ORNL	\$3,860,000	\$2,960,000	<b>• STATUS SUMMARY</b> The Westinghouse PWR design review at INEL was started February 1, 1983. # Draft final report on the effects of control systems failures on transients and accidents for a GE design was submitted by INEL for staff review in July 1984. # Draft final report on the effects of control system failures on transients and accidents at a Westinghouse 3-Loop PWR was submitted by INEL for staff review in August 1984. A draft report on the overfill transient for the B&W review was submitted by ORNL in October 1983. A revised schedule which addresses delays experienced has been approved by the Director, NRR. A draft report on overcooling transients for the B&W review was submitted by ORNL in April 1983.	
FIN NO.	CONTRACTOR	OBLIGATED*	EXPENDED**																
# A-6477	INEL	\$1,385,000	\$1,335,000																
# B-0467 and B-0616	ORNL	\$3,860,000	\$2,960,000																

**B&W-PWR  
PLANT REVIEW  
(OCONEE)**

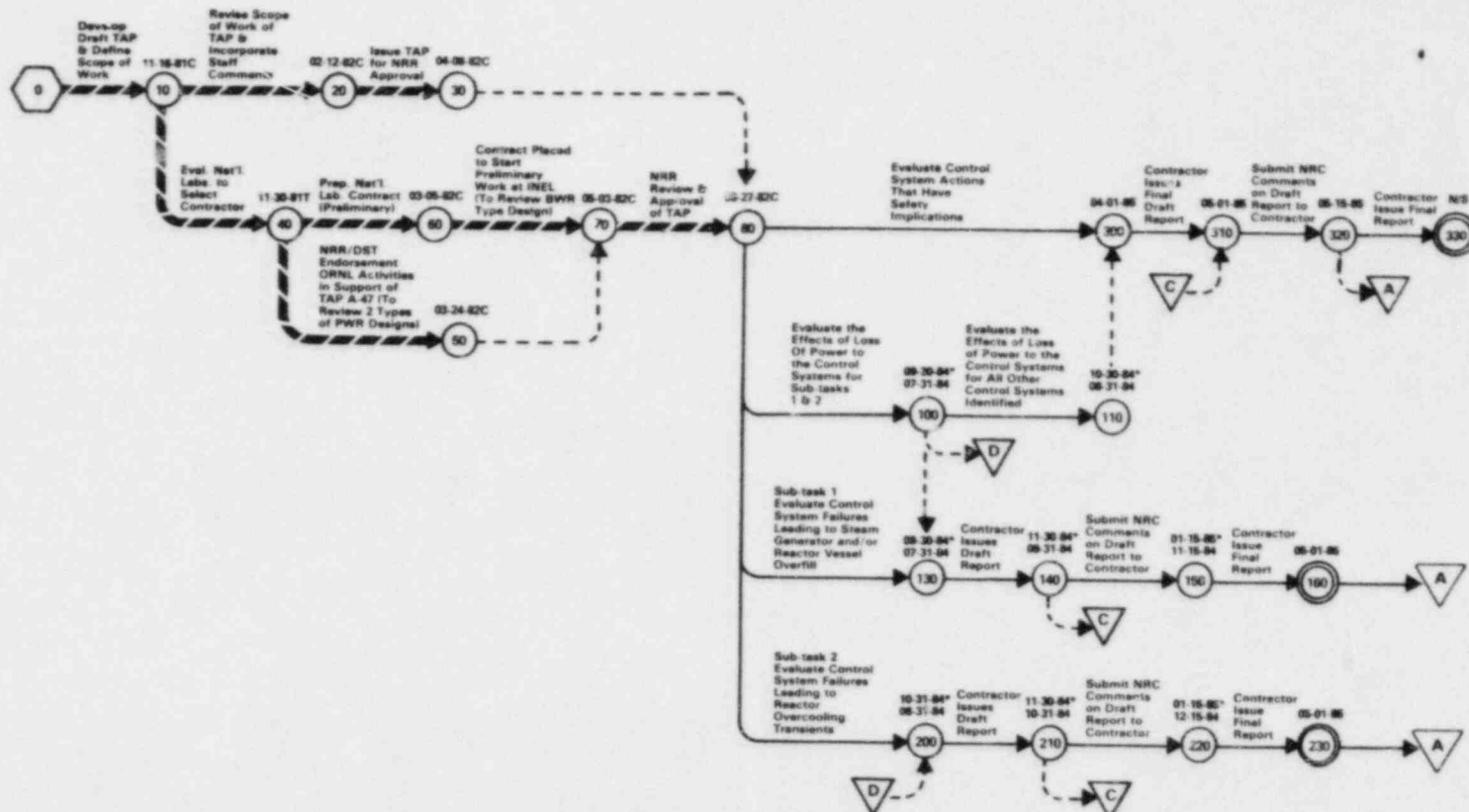
**SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47)**



\* Schedule Change This Report.

CE-PWR  
PLANT REVIEW  
(CALVERT CLIFFS)

SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47)  
CONTINUED

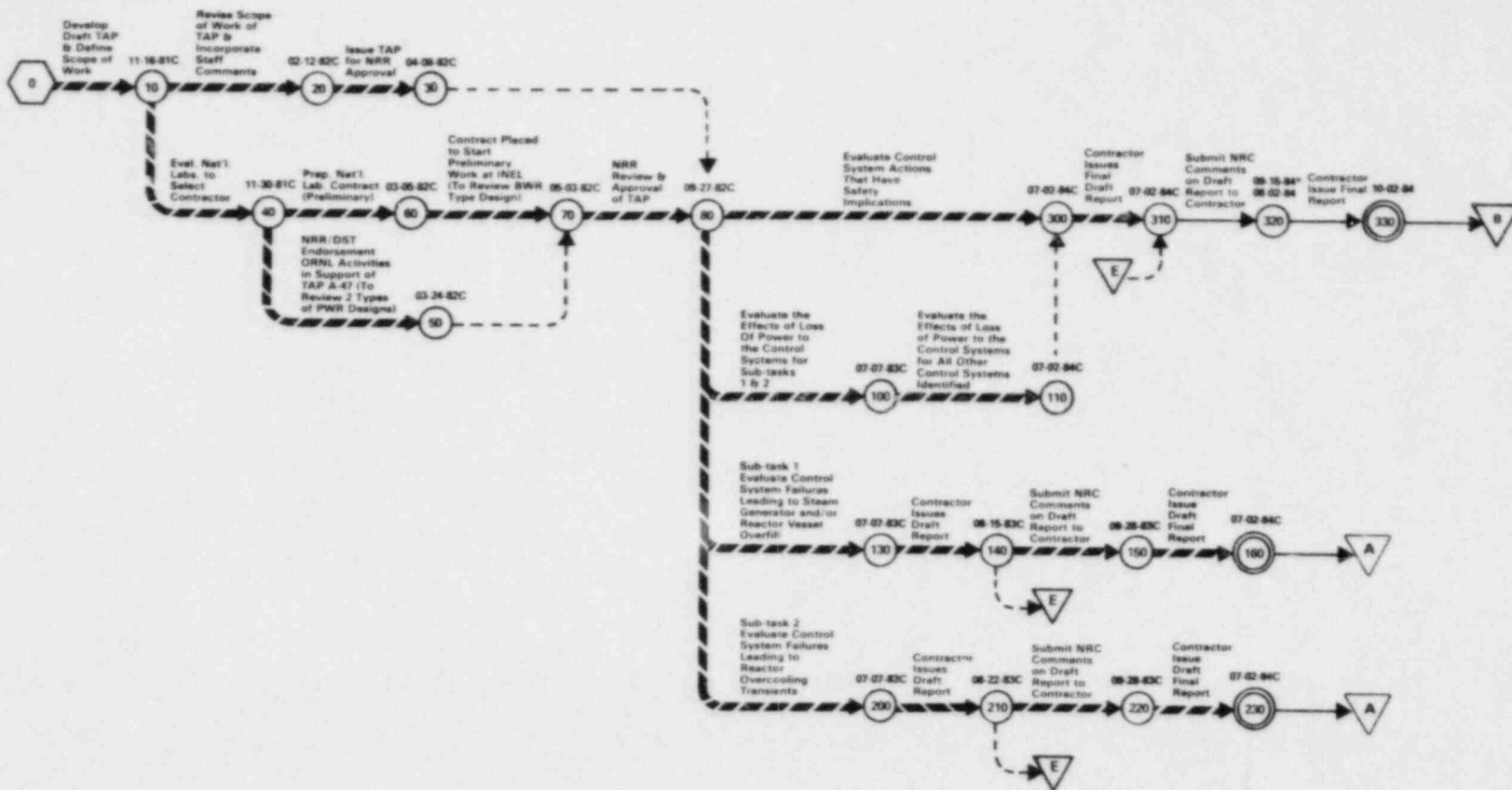


NOTE: This schedule is contingent on the availability of the BG&E simulator for ORNL use, per agreement between RES and BG&E. Simulator studies are to begin in March 1985.

\* Schedule Change This Report.

**GE-BWR  
PLANT REVIEW  
(BROWNS FERRY)**

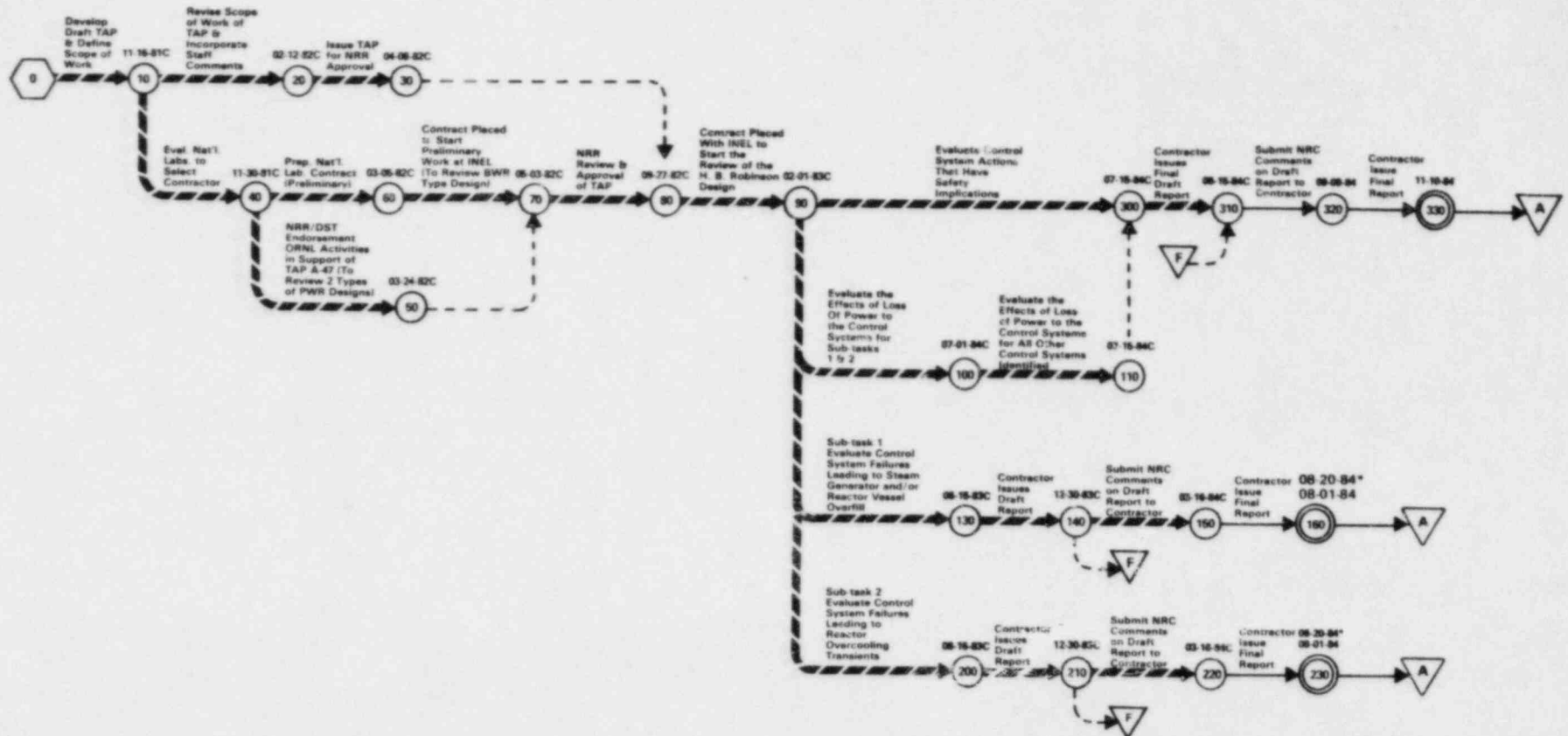
**SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47)  
CONTINUED**



\* Schedule Change This Report.

# WESTINGHOUSE-PWR PLANT REVIEW


# SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47) CONTINUED



\* Schedule Change This Report.

# HYDROGEN CONTROL MEASURES AND EFFECTS OF HYDROGEN BURNS ON SAFETY EQUIPMENT (A-48)

AS OF WEEK ENDING AUGUST 17, 1984

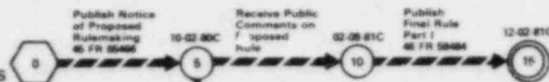
KEY PERSONNEL	TASK REVIEWERS	TASK REVIEWERS	SCHEDULED COMPLETION																																		
<p><b>TASK MANAGER</b> TSUNG MING SU X27477</p>  <p><b>NRR ANALYST</b> JUDY BUTTS X24822</p> <p><b>• PROBLEM DESCRIPTION</b></p> <p>Task A-48 was approved as a USI by the NRC in December 1980.</p> <p>Postulated reactor accidents which result in a degraded or melted core can result in generation and release to the containment of large quantities of hydrogen. The hydrogen is formed from the reaction of the zirconium fuel cladding with steam at high temperatures and/or by radiolysis of water. Experience gained from the TMI-2 accident indicates that we may want to require more specific design provisions for handling larger hydrogen releases than currently required by the regulations particularly for smaller, low pressure containment designs.</p> <p>The scope of this USI is limited to the generic resolution of hydrogen control and equipment qualification for ice condenser and BWR containments, and is based on the licensing case review for these containments.</p>	<table border="1"> <thead> <tr> <th>NAME</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>PAT WORTHINGTON</td> <td>CEBR/DET/RES</td> </tr> <tr> <td>GERALD MAZETIS</td> <td>PSRB/DHFS/NRR</td> </tr> <tr> <td>CHARLES TINKLER</td> <td>CSB/DSI/NRR</td> </tr> <tr> <td>JAMES CARTER</td> <td>RSB/DSI/NRR</td> </tr> <tr> <td>HUKAM GARG</td> <td>EOB/DE/NRR</td> </tr> </tbody> </table> <p><b>• RES INTERFACE INFORMATION</b></p> <p>There are extensive research programs related to the hydrogen issue sponsored by RES. The results of those research programs will be incorporated into licensing decisions, as appropriate.</p> <p><b>• ACRS INTERFACE INFORMATION</b> TO BE DEVELOPED</p>	NAME	BRANCH	PAT WORTHINGTON	CEBR/DET/RES	GERALD MAZETIS	PSRB/DHFS/NRR	CHARLES TINKLER	CSB/DSI/NRR	JAMES CARTER	RSB/DSI/NRR	HUKAM GARG	EOB/DE/NRR	<table border="1"> <thead> <tr> <th></th> <th>CEB/DE/NRR</th> </tr> </thead> <tbody> <tr> <td>KRYSZTOF PARCZEWSKI</td> <td>CEB/DE/NRR</td> </tr> <tr> <td>RICHARD CLEVELAND</td> <td>RSCB/DST/NRR</td> </tr> <tr> <td>VERNON ROONEY</td> <td>DL/NRR</td> </tr> <tr> <td>JOHN LARKINS</td> <td>SAB/DAT/RES</td> </tr> <tr> <td>MARTEN FLEISMAN</td> <td>RAB/DRA/RES</td> </tr> <tr> <td>HAROLD POLK</td> <td>SGEB/DE/NRR</td> </tr> </tbody> </table> <p><b>• TECHNICAL ASSISTANCE CONTRACTS</b> TO BE DEVELOPED</p> <table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		CEB/DE/NRR	KRYSZTOF PARCZEWSKI	CEB/DE/NRR	RICHARD CLEVELAND	RSCB/DST/NRR	VERNON ROONEY	DL/NRR	JOHN LARKINS	SAB/DAT/RES	MARTEN FLEISMAN	RAB/DRA/RES	HAROLD POLK	SGEB/DE/NRR	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED					<p><b>ORIGINAL</b>      06-30-85</p> <p><b>CURRENT</b>      # Not Scheduled</p> <p><b>• POTENTIAL PROBLEMS</b></p> <p>The state-of-the-art has substantial uncertainties. Therefore, there is a potential for new findings which may impact the current schedule.</p> <p>The current schedule was developed on the basis of licensing schedules. As of this date, the licensing schedules for Grand Gulf and Sequoyah have slipped for several months. This slippage will potentially delay the completion date of USI A-48.</p> <p><b>• STATUS SUMMARY</b></p> <p>The Task Action Plan (TAP) was approved on 12/03/82, and a detailed schedule has been developed as shown on the following pages.</p> <p>A Commission Paper regarding hydrogen control for Mark III and ice condenser containments was reviewed and endorsed by CRGR on June 1, 1983. The Commission Paper was forwarded to the Commissioners on August 26, 1983. Additional information was provided on December 28, 1983 to justify the staff position on the Commission Paper.</p> <p># The results of the large scale hydrogen burn tests conducted at Nevada Test Site show potential challenge to equipment survivability. The staff is evaluating the data and will make recommendations to the Commission regarding the Hydrogen Rule.</p>
NAME	BRANCH																																				
PAT WORTHINGTON	CEBR/DET/RES																																				
GERALD MAZETIS	PSRB/DHFS/NRR																																				
CHARLES TINKLER	CSB/DSI/NRR																																				
JAMES CARTER	RSB/DSI/NRR																																				
HUKAM GARG	EOB/DE/NRR																																				
	CEB/DE/NRR																																				
KRYSZTOF PARCZEWSKI	CEB/DE/NRR																																				
RICHARD CLEVELAND	RSCB/DST/NRR																																				
VERNON ROONEY	DL/NRR																																				
JOHN LARKINS	SAB/DAT/RES																																				
MARTEN FLEISMAN	RAB/DRA/RES																																				
HAROLD POLK	SGEB/DE/NRR																																				
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																																		



# HYDROGEN CONTROL MEASURES & EFFECTS OF HYDROGEN BURNS ON SAFETY EQUIPMENT (A-48)

## TASK 1 - NEAR TERM HYDROGEN RULEMAKING

1.1 INTERIM RULE PART 1 - INERTING OF MARK I & II CONTAINMENTS



1.2 INTERIM RULE PART 2 - HYDROGEN CONTROL FOR MARK III AND ICE CONDENSER & DRY CONTAINMENTS



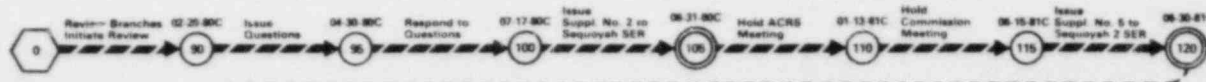
1.3 RULE FOR NEAR TERM CONSTRUCTION PERMITS & MANUFACTURING LICENSE APPLICATIONS



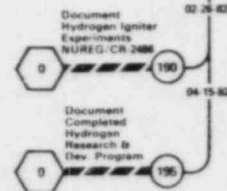
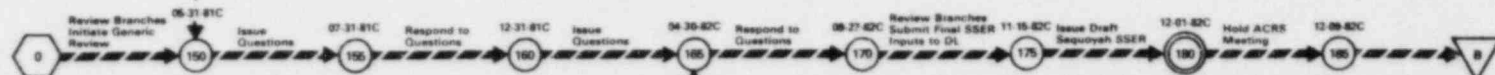
## TASK 2 - PLANT SPECIFIC HYDROGEN REVIEWS

2.1 SEQUOYAH ICE CONDENSER REVIEW

2.1.1 INTERIM IGNITION SYSTEM

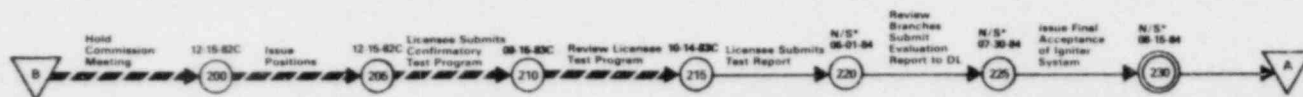


2.1.2 FINAL IGNITION SYSTEM



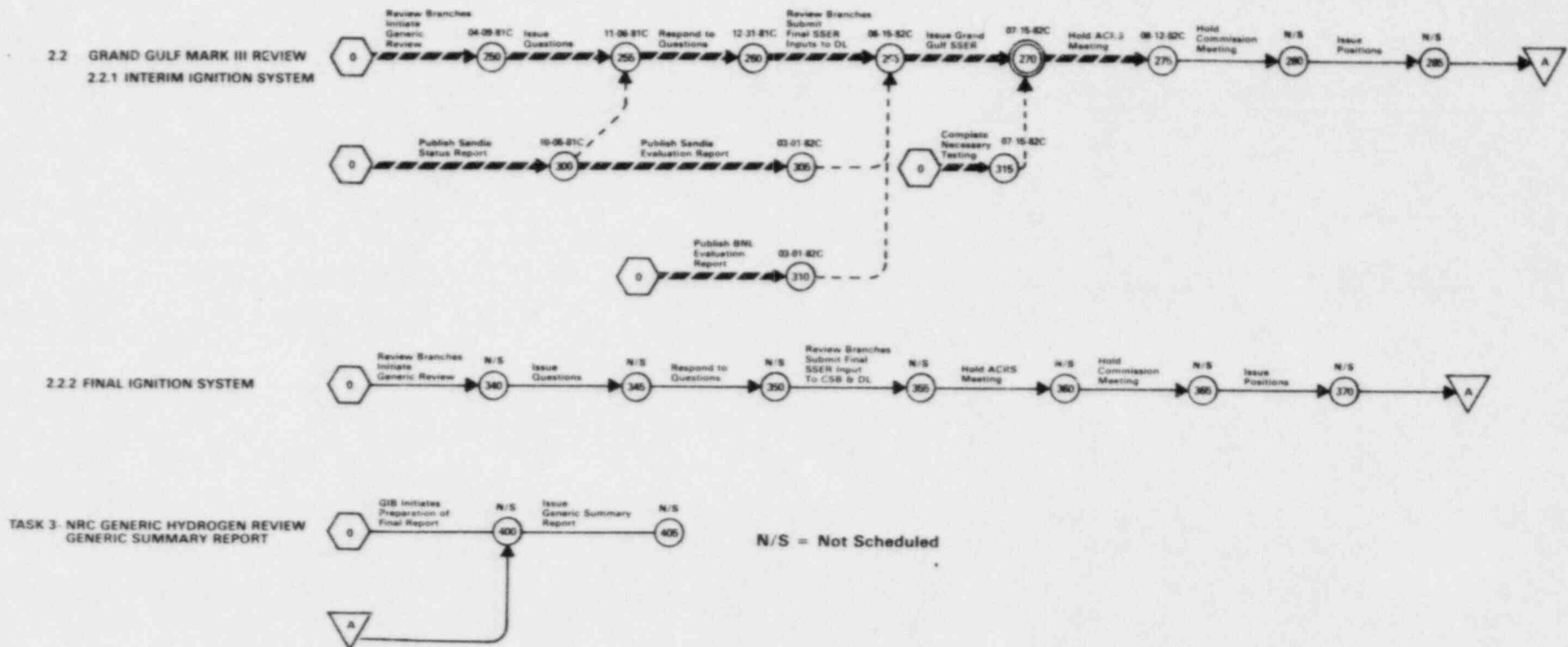
NOTE: Schedule will be developed following completion of staff's evaluation of the large scale hydrogen burn tests conducted at the Nevada Test Site.

N/S = Not Scheduled  
\* Schedule Change This Report.



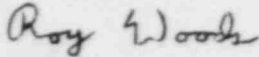
# HYDROGEN CONTROL MEASURES & EFFECTS OF HYDROGEN BURNS ON SAFETY EQUIPMENT (A-48)

CONTINUED



# PRESSURIZED THERMAL SHOCK (A-49)

AS OF WEEK ENDING AUGUST 17, 1984

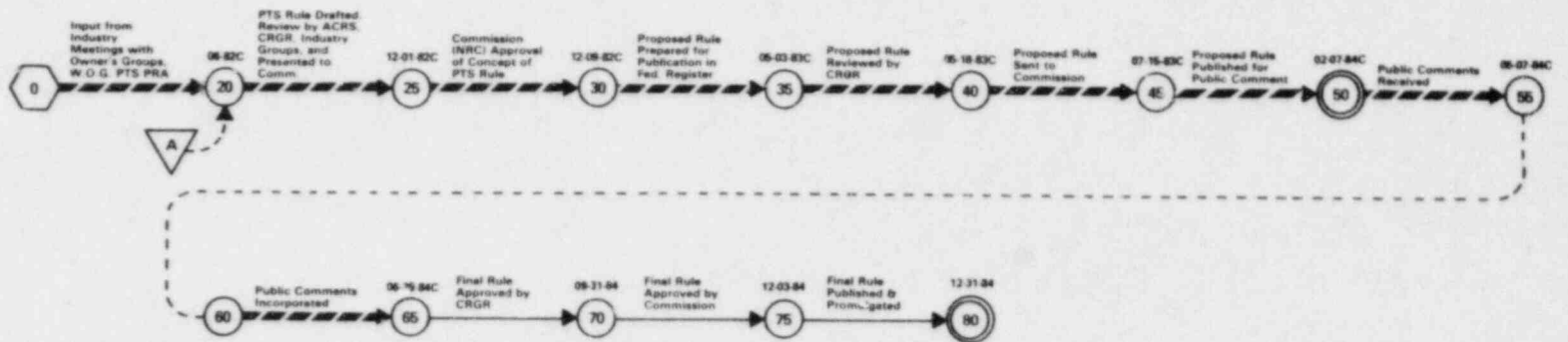
KEY PERSONNEL	TASK REVIEWERS	TASK REVIEWERS	SCHEDULED COMPLETION																																																																												
<b>TASK MANAGER</b> ROY WOODS X24714   <b>NRR ANALYST</b> JUDY BUTTS X24822	<table border="1"> <thead> <tr> <th>NAME</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>F. THROM</td> <td>RSB/NRR</td> </tr> <tr> <td>C. JOHNSON</td> <td>RES</td> </tr> <tr> <td>L. LOIS</td> <td>CPB/DSI</td> </tr> <tr> <td>J. STROSNIDER</td> <td>RES</td> </tr> <tr> <td>M. VAGINS</td> <td>RES</td> </tr> </tbody> </table>	NAME	BRANCH	F. THROM	RSB/NRR	C. JOHNSON	RES	L. LOIS	CPB/DSI	J. STROSNIDER	RES	M. VAGINS	RES	<table border="1"> <thead> <tr> <th>NAME</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>R. JOHNSON</td> <td>GIB/DST</td> </tr> <tr> <td>R. KLECKER</td> <td>MTEB/DE</td> </tr> <tr> <td>N. RANDALL</td> <td>MTEB/DE</td> </tr> <tr> <td>G. VISSING</td> <td>ORB 4/DL</td> </tr> <tr> <td>J. CLIFFORD</td> <td>PTRB/HFS</td> </tr> <tr> <td>S. ISRAEL</td> <td>RRAB/DST</td> </tr> </tbody> </table>	NAME	BRANCH	R. JOHNSON	GIB/DST	R. KLECKER	MTEB/DE	N. RANDALL	MTEB/DE	G. VISSING	ORB 4/DL	J. CLIFFORD	PTRB/HFS	S. ISRAEL	RRAB/DST	<table border="1"> <thead> <tr> <th>ORIGINAL</th> <th>Not Determined</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <th>CURRENT</th> <th>03-31-86</th> </tr> </tbody> </table>	ORIGINAL	Not Determined			CURRENT	03-31-86																																												
NAME	BRANCH																																																																														
F. THROM	RSB/NRR																																																																														
C. JOHNSON	RES																																																																														
L. LOIS	CPB/DSI																																																																														
J. STROSNIDER	RES																																																																														
M. VAGINS	RES																																																																														
NAME	BRANCH																																																																														
R. JOHNSON	GIB/DST																																																																														
R. KLECKER	MTEB/DE																																																																														
N. RANDALL	MTEB/DE																																																																														
G. VISSING	ORB 4/DL																																																																														
J. CLIFFORD	PTRB/HFS																																																																														
S. ISRAEL	RRAB/DST																																																																														
ORIGINAL	Not Determined																																																																														
CURRENT	03-31-86																																																																														
<p><b>• PROBLEM DESCRIPTION</b></p> <p>This task was designated a USI by the NRC in December 1981.</p> <p>Neutron irradiation of reactor pressure vessel weld and plate materials decreases the fracture toughness of the materials. The fracture toughness sensitivity to radiation induced change is increased by presence of certain materials such as copper. Decreased fracture toughness makes it more likely that, if a severe overcooling event occurs followed by or concurrent with high vessel pressure, and if a small crack is present on the vessel's inner surface, that crack could grow to a size that might threaten vessel integrity.</p> <p>Severe pressurized overcooling events are improbable since they require multiple failures and improper operator performance. However, certain precursor events have happened that could have potentially threatened vessel integrity if additional failures had occurred and/or if the vessel had been more highly irradiated. Therefore, the possibility of vessel failure due to a severe pressurized overcooling event cannot be ruled out.</p>	<p><b>• RES INTERFACE INFORMATION</b></p> <p>A major portion of the work is being performed under a contract with Oak Ridge National Laboratory through the Division of Risk Analysis, RES (FIN # 80468).</p> <p>Other major contributors are:</p> <ul style="list-style-type: none"> <li>Primary: System Integrity Research Program through the Division of Engineering Technology, RES and</li> <li>Code Applications Program through the Division of Accident Evaluation, RES</li> </ul> <p><b>• ACRS INTERFACE INFORMATION</b></p> <p>Meetings have been held and will be scheduled as necessary with the Subcommittee on Metallic Components and with the full ACRS. The latest Subcommittee meeting was held on May 17, 1984.</p> <p>A full ACRS Committee meeting on this subject is scheduled for October 1984.</p>	<p><b>• TECHNICAL ASSISTANCE CONTRACTS</b></p> <p>Contract (B-2510) issued to PNL. PNL will perform sensitivity studies using the VISA code, and investigate vessel failure modes due to PTS.</p> <p>The following RES contracts are providing technical assistance to the PTS program. These are in addition to the technical assistance contracts which were initiated to specifically address the PTS issue and listed in the table below.</p> <table border="1"> <thead> <tr> <th>FIN NO.</th> <th>LAB</th> <th>DESCRIPTION</th> </tr> </thead> <tbody> <tr> <td>G-1047</td> <td>Purdue</td> <td>Mixing Calculations</td> </tr> <tr> <td>A-4070</td> <td>Creare</td> <td>Mixing Experiments</td> </tr> <tr> <td>A-3266</td> <td>BNL</td> <td>T-H Calculation Comparisons</td> </tr> <tr> <td>A-7306</td> <td>LASL</td> <td>SOLA Mixing Calculations</td> </tr> <tr> <td>A-7315</td> <td>LASL</td> <td>TRAC T-H Calculations</td> </tr> <tr> <td>A-6047</td> <td>INEL</td> <td>RELAP T-H Calculations</td> </tr> <tr> <td>B-0468</td> <td>ORNL</td> <td>Integrated PTS Study</td> </tr> <tr> <td>B-0119</td> <td>ORNL</td> <td>HSSST Experiments</td> </tr> <tr> <td>B-2800</td> <td>ENSA</td> <td>Struct. Integrity</td> </tr> <tr> <td>B-6290</td> <td>NSRDC</td> <td>Spectrum Shape</td> </tr> <tr> <td>B-7026</td> <td>USNA</td> <td>Rapid J-R Curve</td> </tr> <tr> <td>B-2842</td> <td>Gundremming</td> <td></td> </tr> <tr> <td>B-2853</td> <td>PNL</td> <td>Visa Development</td> </tr> <tr> <td>B-6988</td> <td>HEDL</td> <td>Dosimetry</td> </tr> <tr> <td>B-0415</td> <td>ORNL</td> <td>P-V Simulation</td> </tr> <tr> <td>B-6224</td> <td>NBS</td> <td>Dosimetry</td> </tr> <tr> <td>B-2289</td> <td>PNL</td> <td>NDE</td> </tr> <tr> <td>B-2967</td> <td>PNL</td> <td>NDE</td> </tr> <tr> <td>B-2088</td> <td>PNL</td> <td>Acoustic</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td>#B-2510</td> <td>PNL</td> <td>\$851K</td> <td>\$668K</td> </tr> <tr> <td>#A-7272</td> <td>LANL</td> <td>\$580K-FY83</td> <td>\$580K</td> </tr> <tr> <td>A-3701</td> <td>BNL</td> <td>\$200K</td> <td>\$200K</td> </tr> </tbody> </table>	FIN NO.	LAB	DESCRIPTION	G-1047	Purdue	Mixing Calculations	A-4070	Creare	Mixing Experiments	A-3266	BNL	T-H Calculation Comparisons	A-7306	LASL	SOLA Mixing Calculations	A-7315	LASL	TRAC T-H Calculations	A-6047	INEL	RELAP T-H Calculations	B-0468	ORNL	Integrated PTS Study	B-0119	ORNL	HSSST Experiments	B-2800	ENSA	Struct. Integrity	B-6290	NSRDC	Spectrum Shape	B-7026	USNA	Rapid J-R Curve	B-2842	Gundremming		B-2853	PNL	Visa Development	B-6988	HEDL	Dosimetry	B-0415	ORNL	P-V Simulation	B-6224	NBS	Dosimetry	B-2289	PNL	NDE	B-2967	PNL	NDE	B-2088	PNL	Acoustic	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	#B-2510	PNL	\$851K	\$668K	#A-7272	LANL	\$580K-FY83	\$580K	A-3701	BNL	\$200K	\$200K	<p><b>• POTENTIAL PROBLEMS</b></p> <p><b>• STATUS SUMMARY</b></p> <p>The Task Action Plan for A-49 was approved and issued on March 26, 1982.</p> <p>NRC Staff PTS recommendations (SECY 82-466) were approved by the Commission in December 1982. A new rule for PTS resolution was published for public comment on February 7, 1984.</p> <p>The TAP has been extensively revised (Revision 1) to reflect division of the program into two parts, a short term program, "Development of a PTS Rule" and a long term program that will provide "Guidance and Acceptance Criteria for the Analyses to be Required by the PTS Rule." The revised TAP describes issuance of the new rule, confirmatory studies now underway to support the new rule, and the plant specific analyses and other requirements that will be included in the new rule.</p> <p>A status report regarding flux reduction efforts was sent to the Commission on February 25, 1983 (SECY 83-79). The final report was submitted on October 28, 1983 (SECY 83-443).</p> <p>Revision 1 of the TAP as described above was approved on November 22, 1983 by the Director of NRR. Revision 2, containing minor scheduled changes, was submitted to the Director of NRR for approval in March 1984.</p>
FIN NO.	LAB	DESCRIPTION																																																																													
G-1047	Purdue	Mixing Calculations																																																																													
A-4070	Creare	Mixing Experiments																																																																													
A-3266	BNL	T-H Calculation Comparisons																																																																													
A-7306	LASL	SOLA Mixing Calculations																																																																													
A-7315	LASL	TRAC T-H Calculations																																																																													
A-6047	INEL	RELAP T-H Calculations																																																																													
B-0468	ORNL	Integrated PTS Study																																																																													
B-0119	ORNL	HSSST Experiments																																																																													
B-2800	ENSA	Struct. Integrity																																																																													
B-6290	NSRDC	Spectrum Shape																																																																													
B-7026	USNA	Rapid J-R Curve																																																																													
B-2842	Gundremming																																																																														
B-2853	PNL	Visa Development																																																																													
B-6988	HEDL	Dosimetry																																																																													
B-0415	ORNL	P-V Simulation																																																																													
B-6224	NBS	Dosimetry																																																																													
B-2289	PNL	NDE																																																																													
B-2967	PNL	NDE																																																																													
B-2088	PNL	Acoustic																																																																													
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																																																																												
#B-2510	PNL	\$851K	\$668K																																																																												
#A-7272	LANL	\$580K-FY83	\$580K																																																																												
A-3701	BNL	\$200K	\$200K																																																																												

# PRESSURIZED THERMAL SHOCK (A-49) SHORT TERM PROGRAM

**TASK A:**  
Review of information requested by August 21, 1981 letters to industry groups and eight selected utilities



**TASK B:**  
Promulgation of a new PTS Rule



**TASK C:**  
Consideration of flux reduction options for lead plants †



† PTS Rule also requires consideration of flux reduction option for all PWRs. This Task (C) is such consideration in the immediate future to prevent preclusion of this option for the oldest (lead) plants.

## PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM

### Task 1:

Development of a Revised Regulatory Guide 1.99

Draft revision of the trend curves in Reg. Guide 1.99, Revision 1, "Effects of Residual Elements on Predicted Radiation Damage to Reactor Vessel Materials": This task is no longer considered to be necessary for completion of A-49. Its scheduled completion is a longer term item than A-49, and adequate guidance regarding this subject is contained within Task (B). A detailed schedule for this task is therefore not presented.

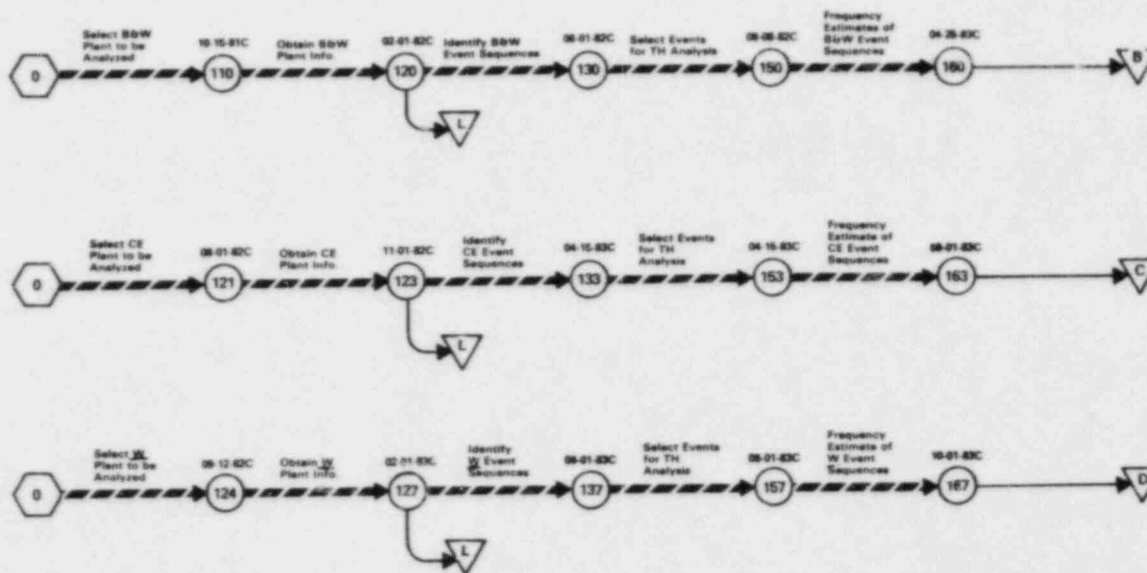
### Task 2:

Ongoing Program to Improve Procedures and Operator Training

This program is ongoing separate from the A-49 PTS effort and is much broader than PTS, considering PTS as one of the many types of incidents for which procedures and training should be improved, on a combined/integrated basis. Generic Letter 82-33 contains a description of the overall program and schedule. The PTS effort cannot and should not be separated from the overall effort, and so a detailed PTS schedule is not presented here. The ongoing program will be completed and applied to each plant, however, on a schedule compatible with completion of the final PTS resolution for each plant (i.e., before acceptance of plant specific analyses required by the PTS rule, Task (B) above.)

### Task 3:

Determination of Event Sequences to be Considered



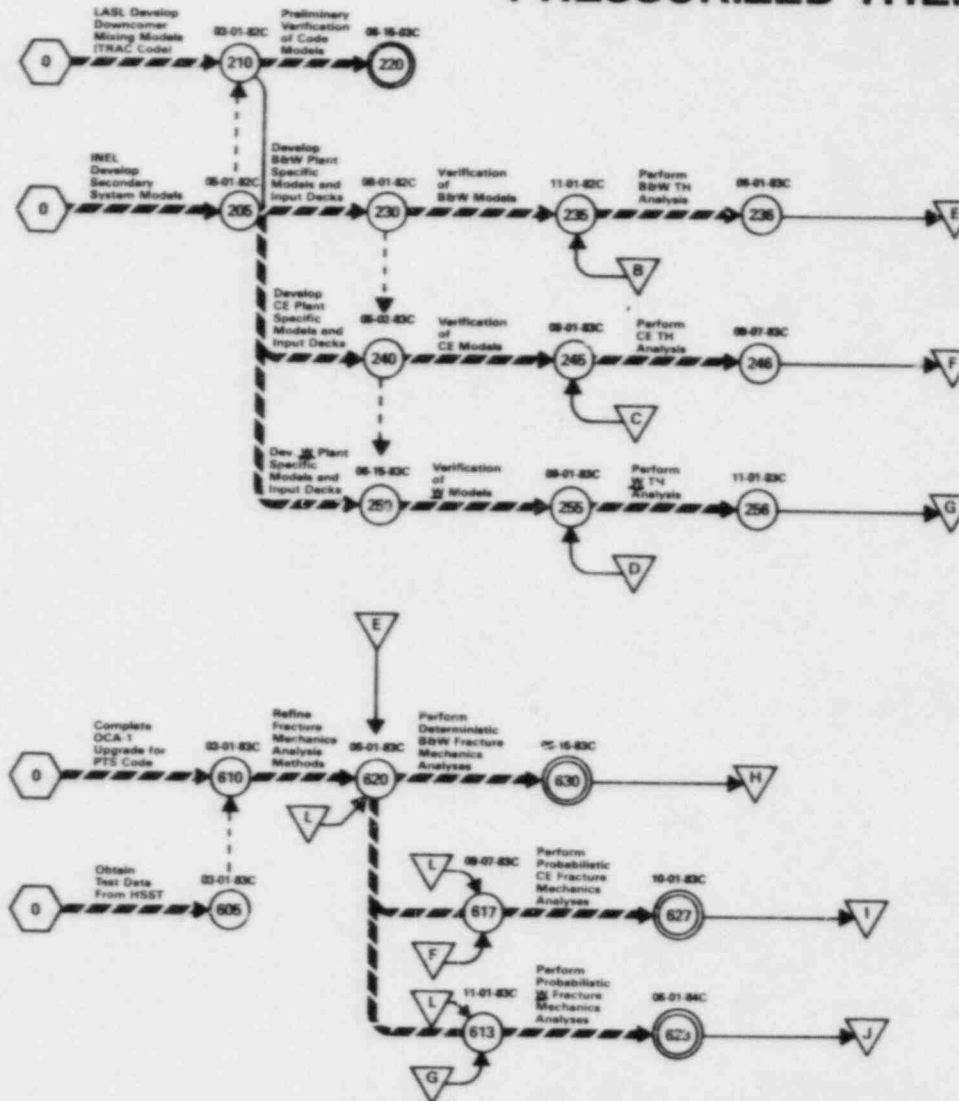
# PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM (CONTINUED)

Task 4:  
Transient Model Development  
& Verification

Task 5:  
Calculation of  
P(t) and T(t)

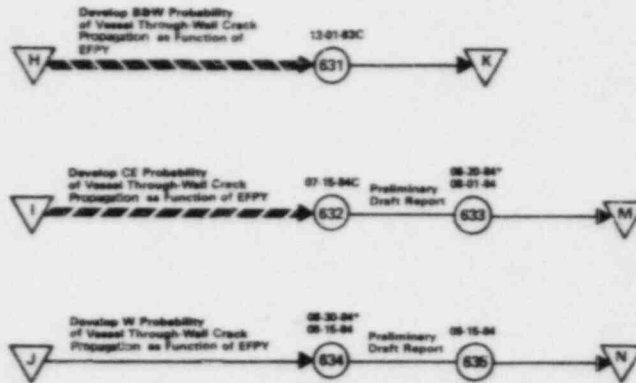
Task 6:  
Improvements in Methods  
and Data for Fracture  
Mechanics and Calculations

Task 7:  
Vessel Failure Analysis

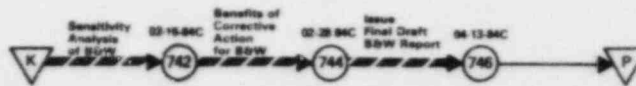


# PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM (CONTINUED)

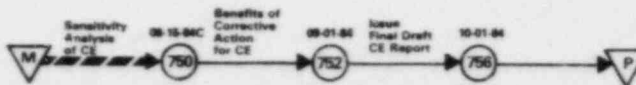
Task 8:  
Integration of Results



Task 9:  
Plant-Specific Sensitivity Studies, Benefits of Corrective Actions, and Draft Final Report for B&W Plant



Task 10:  
Plant-Specific Sensitivity Studies, Benefits of Corrective Actions, and Draft Final Report for CE Plant



Task 11:  
Plant-Specific Sensitivity Studies, Benefits of Corrective Actions, and Draft Final Report for W Plant



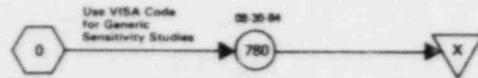
\* Schedule Change This Report.

# PRESSURIZED THERMAL SHOCK (A-4)9

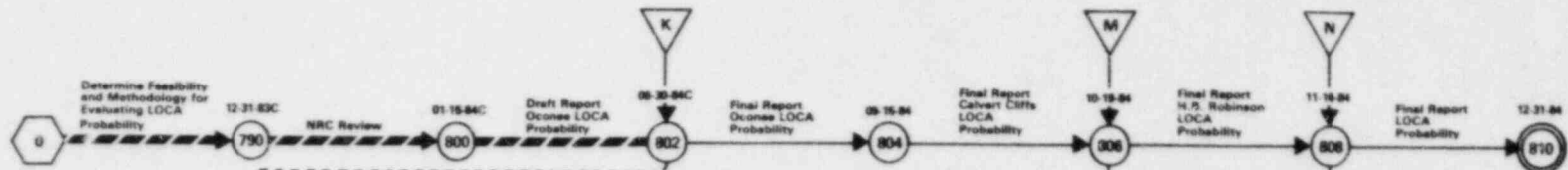
## LONG TERM PROGRAM

### (CONTINUED)

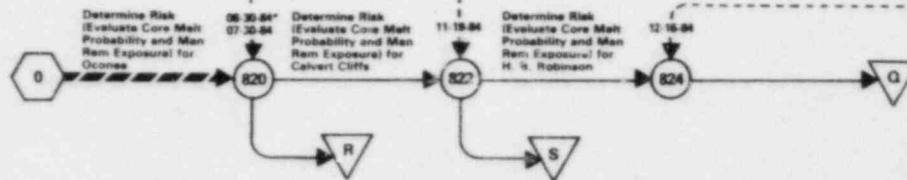
Task 12:  
Generic Sensitivity Studies



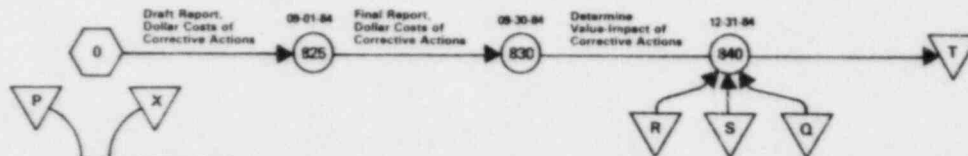
Task 13:  
Determine LOCA Probability



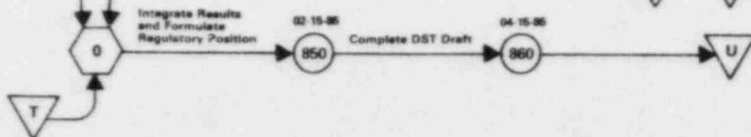
Task 14:  
Determine Risk



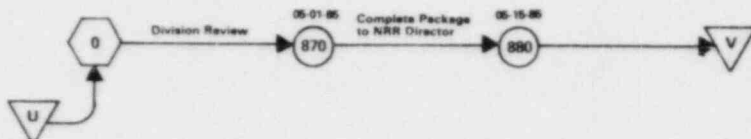
Task 15:  
Value-Impact



Task 16:  
Regulatory Position



Task 17:  
Internal Review

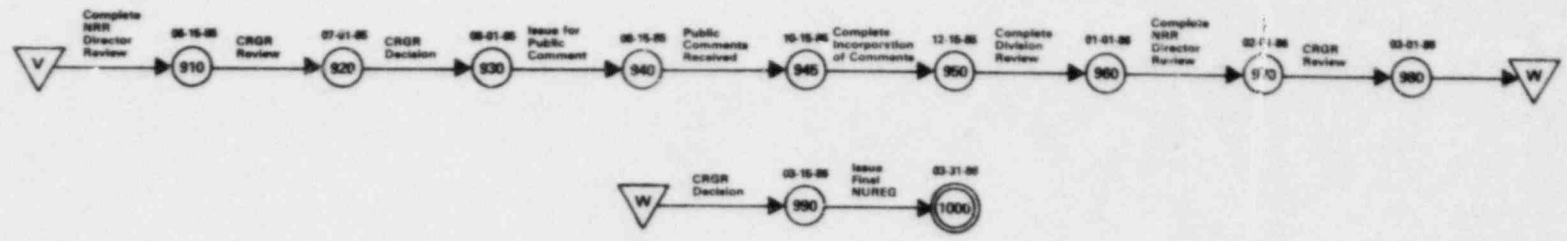


\* Schedule Change This Report.



# PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM (CONTINUED)

Task 18:  
Issue Final  
Technical Resolution



<b>NRC FORM 335</b> (7-77)		<b>U.S. NUCLEAR REGULATORY COMMISSION</b> <b>BIBLIOGRAPHIC DATA SHEET</b>		<b>1. REPORT NUMBER (Assigned by DDC)</b> NUREG-0006, Vol. 6, No. 3	
<b>4. TITLE AND SUBTITLE (Add Volume No., if appropriate)</b> Unresolved Safety Issues Summary Aqua Book		<b>2. (Leave blank)</b>		<b>3. RECIPIENT'S ACCESSION NO.</b>	
<b>7. AUTHOR(S)</b>		<b>5. DATE REPORT COMPLETED</b> MONTH: August      YEAR: 1984		<b>6. (Leave blank)</b>	
<b>9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)</b> U. S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Division of Safety Technology Washington, D. C. 20555		<b>DATE REPORT ISSUED</b> MONTH: August      YEAR: 1984		<b>8. (Leave blank)</b>	
<b>12. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code)</b> U. S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Division of Safety Technology Washington, D. C. 20555		<b>10. PROJECT TASK WORK UNIT NO.</b>		<b>11. CONTRACT NO.</b>	
<b>13. TYPE OF REPORT</b>		<b>PERIOD COVERED (Inclusive dates)</b> May 19, 1984 - August 17, 1984			
<b>15. SUPPLEMENTARY NOTES</b>		<b>14. (Leave blank)</b>			
<b>16. ABSTRACT (200 words or less)</b> Provide an overview of the status of the progress and plans for resolution of the generic tasks addressing "Unresolved Safety Issues" as reported to Congress.					
<b>17. KEY WORDS AND DOCUMENT ANALYSIS</b>			<b>17a. DESCRIPTORS</b>		
<b>17b. IDENTIFIERS OPEN-ENDED TERMS</b>					
<b>18. AVAILABILITY STATEMENT</b> Unlimited		<b>19. SECURITY CLASS (This report)</b> Unclassified		<b>21. NO. OF PAGES</b>	
		<b>20. SECURITY CLASS (This page)</b> Unclassified		<b>22. PRICE</b> \$	

NRC FORM 335 (7-77)