

NUREG-0606

Vol. 6, No. 2

May 18, 1984

UNRESOLVED SAFETY ISSUES SUMMARY

AQUA BOOK

UNITED STATES NUCLEAR REGULATORY COMMISSION



B406120260 B40531
PDR NUREG PDR
0606 R

NUREG-0606
Vol. 6, No. 2
May 18, 1984

UNRESOLVED SAFETY ISSUES SUMMARY

AQUA BOOK

Manuscript Completed: May 1984
Date Published: May 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 SCHEDULES IN THIS BOOK INCLUDE A MILESTONE AT THE END OF EACH ACTION PLAN WHICH REPRESENTS THE INITIATION 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

* NOT SCHEDULED (N/S) DATES

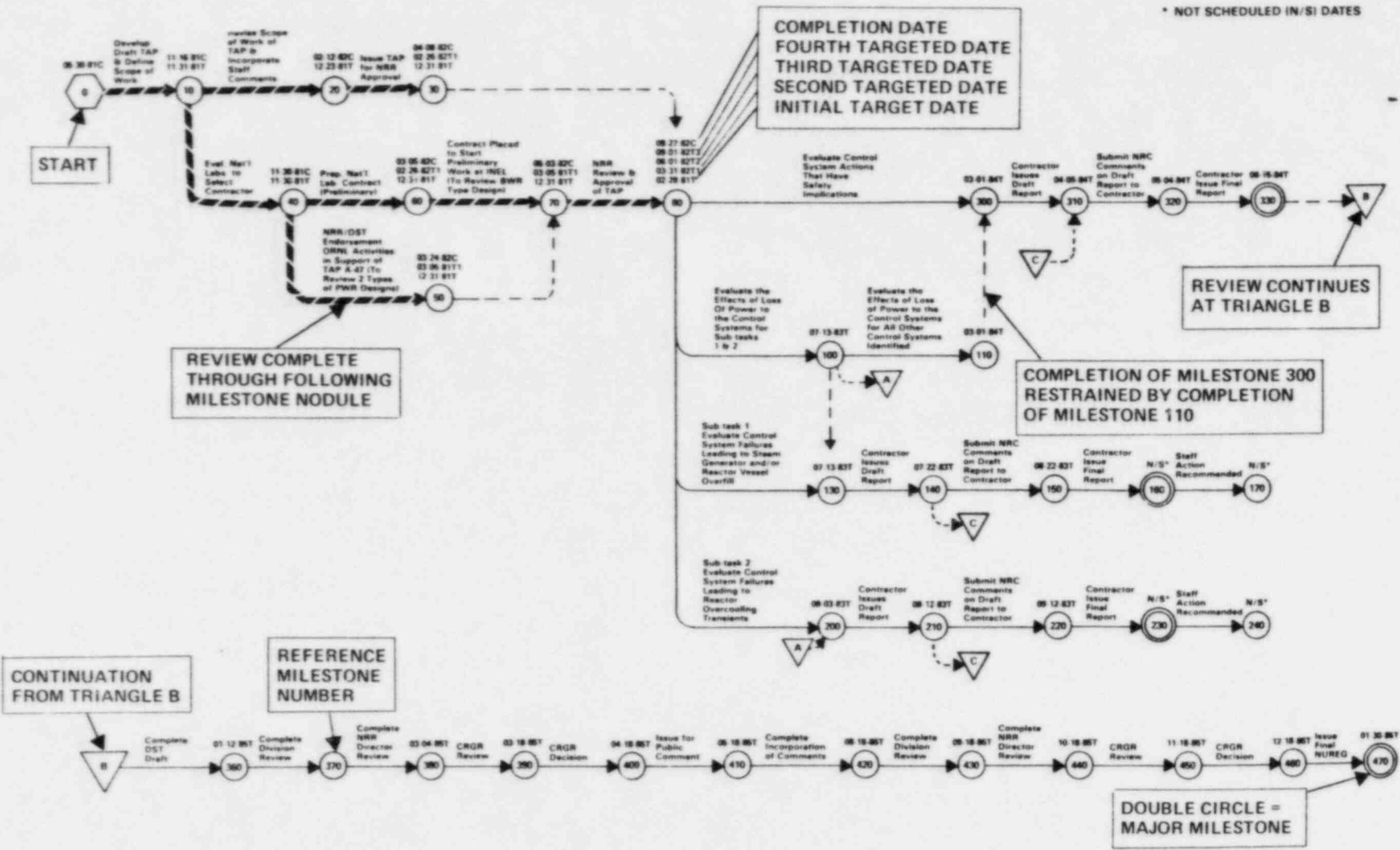


TABLE OF CONTENTS

<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
10-13	A-1	ALECK SERKIZ	WATER HAMMER
14-15	A-3, A-4, A-5	JACK STROSNIDER	W, CE, AND B&W STEAM GENERATOR TUBE INTEGRITY
16-19	A-17	DALE THATCHER	SYSTEMS INTERACTIONS IN NUCLEAR POWER PLANTS
20-23	A-40	SYED SHAUKAT	SEISMIC DESIGN CRITERIA-SHORT TERM PROGRAM
24-25	A-43	ALECK SERKIZ	CONTAINMENT EMERGENCY SUMP PERFORMANCE
26-27	A-44	ALAN RUBIN	STATION BLACKOUT
28-31	A-45	ANDREW MARCHESE	SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS
32-35	A-46	T. Y. CHANG	SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS
36-41	A-47	ANDREW SZUKIEWICZ	SAFETY IMPLICATIONS OF CONTROL SYSTEMS
42-45	A-48	TSUNG SU	HYDROGEN CONTROL MEASURES AND EFFECTS OF HYDROGEN BURNS ON SAFETY EQUIPMENT
46-52	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)	EPR:	ELECTRIC POWER RESEARCH INSTITUTE
AEB:	ACCIDENT EVALUATION BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	EQB:	EQUIPMENT QUALIFICATION BRANCH, DIVISION OF ENGINEERING (NRR)
AEOO:	OFFICE OF THE ANALYSIS AND EVALUATION OF OPERATIONAL DATA	FIN:	FINANCIAL
AIF:	ATOMIC INDUSTRIAL FORUM	FSTF:	FULL-SCALE TEST FACILITY
APTS:	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
DEDRGR:	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
ORB:	OPERATING REACTORS BRANCH, DIVISION OF LICENSING (NRR)		DIVISION OF LICENSING (NRR)
ORNL:	OAK RIDGE NATIONAL LABORATORY	STP:	SHORT-TERM PROGRAM
OSD:	OFFICE OF STANDARDS DEVELOPMENT (FORMER NRC OFFICE)	TAP:	TASK ACTION PLAN
OTSQ	ONCE-THROUGH STEAM GENERATOR	TER:	TECHNICAL EVALUATION REPORT
PASNY:	POWER AUTHORITY OF THE STATE OF NEW YORK	TH:	THERMAL HYDRAULICS
PDA:	PRELIMINARY DESIGN APPROVAL	TM:	TASK MANAGER
PNL:	PACIFIC NORTHWEST LABORATORY (BATTELLE)	TMI:	THREE MILE ISLAND
PRA:	PROBABILISTIC RISK ASSESSMENT	UCLA:	UNIVERSITY OF CALIFORNIA, LOS ANGELES
PSB:	POWER SYSTEMS BRANCH, DIVISION OF SYSTEMS INTEGRATION (NRR)	USI:	UNRESOLVED SAFETY ISSUE
PSU:	PLANT SYSTEMS UNIT (AEOD)	W:	WESTINGHOUSE ELECTRIC CORPORATION
PTRB:	PROCEDURES AND TEST REVIEW BRANCH, DIVISION OF HUMAN FACTORS SAFETY (NRR)	WH:	WATER HAMMER
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		
SOUG:	SEISMIC QUALIFICATION UTILITIES GROUP		
SRP:	STANDARD REVIEW PLAN		
SRV:	SAFETY RELIEF VALVE		

PROGRAM STATUS

<u>USI NO.</u>	<u>TITLE</u>	<u>FEBRUARY 17, 1984 AQUA BOOK SCHEDULED COMPLETION DATE</u>	<u>CURRENT SCHEDULED COMPLETION DATE</u>	<u>REMARKS</u>
A-3, A-4, A-5.	STEAM GENERATOR TUBE INTEGRITY	MAY 1984	NOT SCHEDULED	THE DRAFT NUREG REPORT HAS BEEN REVIEWED BY THE TECHNICAL BRANCHES, THEIR COMMENTS INCORPORATED, AND TRANSMITTED TO CRGR. A COMMISSION BRIEFING IS PLANNED FOR JUNE 1984.
A-17.	SYSTEMS INTER-ACTIONS	MARCH 30, 1986	MARCH 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.
A-40.	SEISMIC DESIGN CRITERIA	JANUARY 10, 1985	APRIL 1, 1985	THE NRC STAFF INTERNAL REVIEW HAS BEEN COMPLETED. A VALUE/IMPACT ANALYSIS HAS BEEN PREPARED BY LLNL AND A CRGR SUBMITTAL PACKAGE WAS PREPARED AND FORWARDED TO THE DIRECTOR OF NRR FOR SIGNATURE.
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 WHICH IS SCHEDULED FOR MAY 1984.
A-44.	STATION BLACKOUT	FEBRUARY 15, 1985	FEBRUARY 15, 1985	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 WAS FORWARDED TO THE CRGR. 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.
A-45.	SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS	OCTOBER 30, 1985	OCTOBER 30, 1985	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.

PROGRAM STATUS

<u>USI NO.</u>	<u>TITLE</u>	<u>FEBRUARY 17, 1984 AQA BOOK SCHEDULED COMPLETION DATE</u>	<u>CURRENT SCHEDULED COMPLETION DATE</u>	<u>REMARKS</u>
A-46	SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS	DECEMBER 14, 1984	FEBRUARY 15, 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 MAY 1984.
A-47	SAFETY IMPLICATIONS OF CONTROL SYSTEMS	NOT SCHEDULED	APRIL 1, 1986	INEL SUBMITTED DRAFT REPORTS ON THE GE REVIEW OF OVERFILL AND OVERCOOLING TRANSIENTS AND THE WESTINGHOUSE REVIEW OF OVERFILL AND OVERCOOLING TRANSIENTS FOR STAFF REVIEW IN AUGUST 1983 AND JANUARY 1984, RESPECTIVELY. ORNL SUBMITTED DRAFT REPORTS FOR THE B&W REVIEW OF OVERFILL TRANSIENTS AND THE B&W REVIEW OF OVERCOOLING TRANSIENTS IN OCTOBER 1983 AND APRIL 1983, RESPECTIVELY.
A-48	HYDROGEN CONTROL MEASURES AND HYDROGEN BURNS ON SAFETY EQUIPMENT	JUNE 30, 1985	JUNE 30, 1986	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 23, 1983.
A-49	PRESSURIZED THERMAL SHOCK	DECEMBER 31, 1985	DECEMBER 31, 1985	THE ORIGINAL TASK ACTION PLAN WAS APPROVED AND ISSUED ON MARCH 26, 1982. REVISION 2 OF THE TASK ACTION PLAN CONTAINING MINOR SCHEDULE CHANGES WAS FORWARDED TO THE DIRECTOR OF NRR FOR APPROVAL IN MARCH 1984. 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.

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 ARE TO BE ISSUED PRIOR TO JULY 1984. 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	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 PREPARED PLANT-UNIQUE ANALYSES FOR SUBMITTAL 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 TEN PLANTS. SERS HAVE BEEN ISSUED FOR EIGHT 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	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 46FR57521	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. HOWEVER, THERE HAS BEEN FURTHER DISCUSSION AMONG THE COMMISSIONERS REGARDING THE SPECIFIC QUALITY ASSURANCE REQUIREMENTS FOR THE ATWS MITIGATING EQUIPMENT AND THEREFORE THE FINAL RULE HAS NOT YET BEEN PUBLISHED.	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-0819	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. EIGHTEEN PLANTS HAVE RECEIVED LETTERS ACCEPTING THEIR PROPOSED MODIFICATION PLANS. FIVE PLANTS ARE BEING REVIEWED AND NEGOTIATIONS ARE UNDER WAY TO OBTAIN LICENSEE COMMITMENTS TO IMPLEMENT ALL NUREG-0819 GUIDANCE. 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. 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 82-28 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 WAS ISSUED FOR PUBLIC COMMENT. COMMENTS WERE RECEIVED AND REVIEWED BY THE STAFF. SRP SECTION 5.3.4 WAS REVISED AS APPROPRIATE. AN ISSUANCE PACKAGE WAS PREPARED AND IS BEING REVIEWED BY THE STAFF PRIOR TO SUBMITTAL TO THE EDO AND CRGR FOR FINAL REVIEW AND APPROVAL. SRP SECTION 5.3.4 WILL APPLY TO CONSTRUCTION PERMIT AND PRELIMINARY DESIGN APPLICATIONS (PROVIDING THE PRELIMINARY DESIGN INCLUDES THE SUBJECT STRUCTURES) FOR PWRs PROVIDING THE CP OR PDA HAS NOT BEEN GRANTED PRIOR TO THE SRP SECTION 5.3.4 FINAL PUBLICATION DATE. THERE IS NO REQUIREMENT FOR BACKFIT IMPLEMENTATION.	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	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	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. TWO LICENSING ACTIONS REMAIN TO BE COMPLETED. SEE MULTIPLANT ACTION ITEM B-04 IN NUREG-0748.	AL DEAGAZIO 492-8945
A-31.	RESIDUAL HEAT REMOVAL REQUIREMENTS	1978	NO FORMAL REPORT SRP 5.4.7 REVISION	RRRC APPROVED IMPLEMENTATION PLAN JANUARY 31, 1978 BEING IMPLEMENTED ON NTOLS DURING THE REVIEW PROCESS. NO BACKFIT TO OPERATING REACTORS IS PLANNED.	- - -
A-38.	CONTROL OF HEAVY LOADS NEAR SPENT FUEL	JULY 1980	NUREG-0612	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 MAY 18, 1984, 35 PHASE I REVIEWS HAVE BEEN COMPLETED AND IT IS ANTICIPATED TO COMPLETE A TOTAL OF 64 BY THE END OF FY-84. THE REMAINING 18 PHASE I REVIEWS WILL BE COMPLETED IN FY-85. MPA C-15, HAS BEEN ESTABLISHED FOR PHASE II, AND 19 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-0783 NUREG-0783 NUREG-0802	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

WATER HAMMER (A-1)

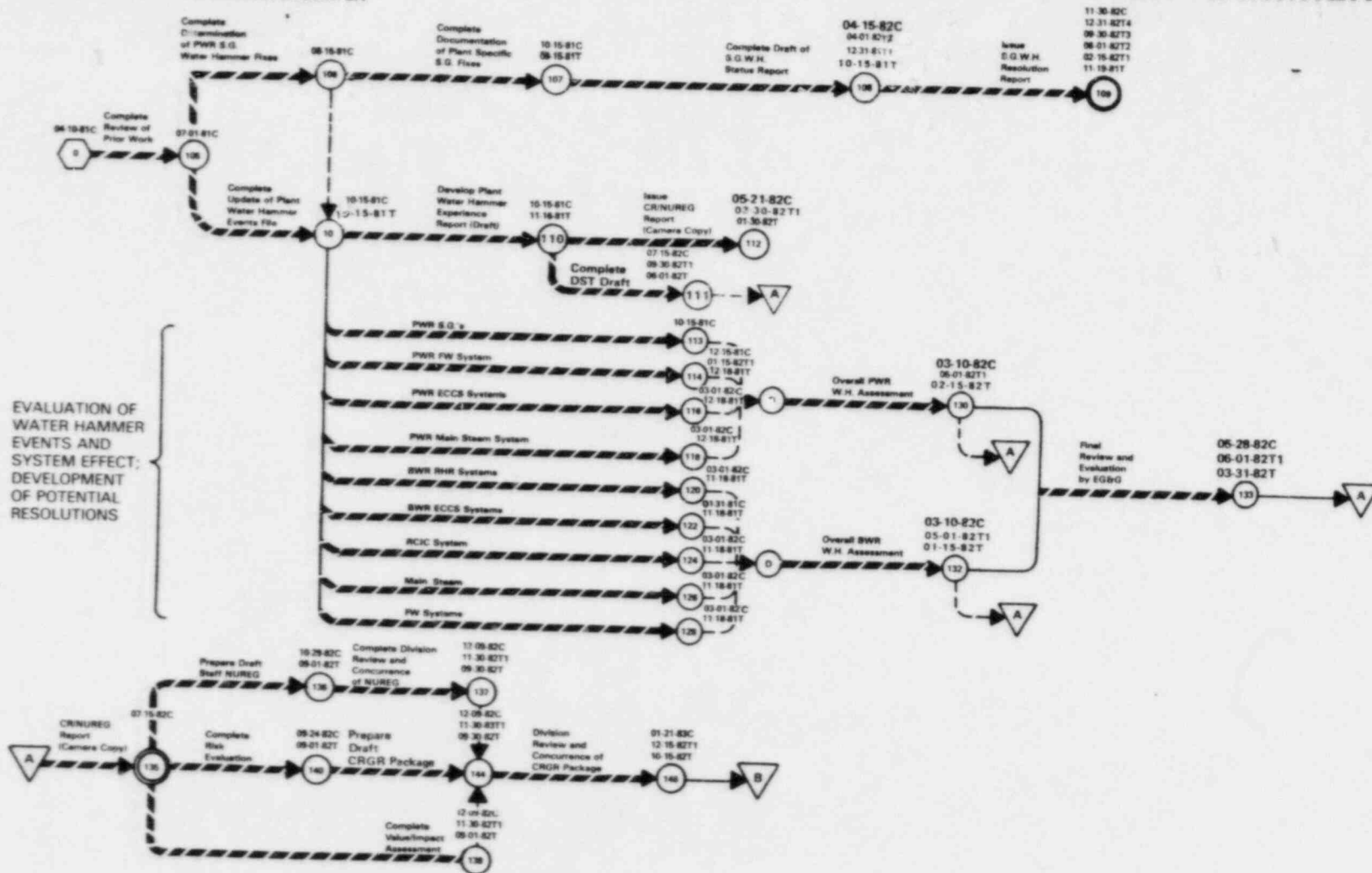
AS OF WEEK ENDING

MAY 18, 1984

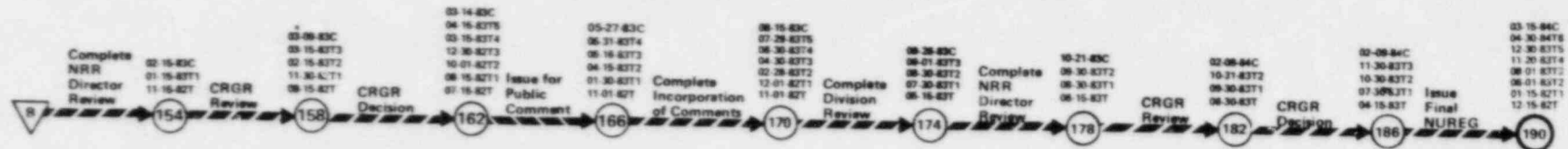
KEY PERSONNEL	TASK REVIEWERS	SCHEDULED COMPLETION																																																													
TASK MANAGER ALECK SERKIZ X24217 <i>Aleck Serkiz</i> NRR ANALYST JUDY BUTTS X24822	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>NAME</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>S. MCKAY</td> <td>PTRB/DHFS</td> </tr> <tr> <td>C. GRAVES</td> <td>RSB/DSI</td> </tr> </tbody> </table>	NAME	BRANCH	S. MCKAY	PTRB/DHFS	C. GRAVES	RSB/DSI	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>1978 ANNUAL REPORT</th> <th>12-31-80</th> </tr> </thead> <tbody> <tr> <td>CURRENT</td> <td>#03-15-84 - Complete</td> </tr> </tbody> </table>		1978 ANNUAL REPORT	12-31-80	CURRENT	#03-15-84 - Complete																																																		
NAME	BRANCH																																																														
S. MCKAY	PTRB/DHFS																																																														
C. GRAVES	RSB/DSI																																																														
1978 ANNUAL REPORT	12-31-80																																																														
CURRENT	#03-15-84 - Complete																																																														
<p>• PROBLEM DESCRIPTION</p> <p>Since 1969 there have been over 150 incidents involving water hammers in BWRs and PWRs reported. The water hammers (or steam hammers) have involved steam generator feedings and piping, the RHR system, ELC systems, and containment spray, service water, feed-water and steam lines. The incidents have been attributed to which causes as rapid condensation of steam pockets, steam-driven slugs of water, pump startup with partially empty lines, and rapid valve motion. Most of the damage reported has been relatively minor, involving pipe hangers and restraints; however, there have been several incidents which have resulted in piping and valve damage.</p> <p>Task Action Plan, TAP A-1, subdivides resolution of this Unresolved Safety Issue (USI) into the following tasks:</p> <p>Task 1: Water Hammer Summary Reports</p> <p>Task 2: Resolution of Water Hammer Issue</p> <p>Task 3: Water Hammer Position for Operating Reactors</p> <p>Task 4: Water Hammer Safety Studies</p> <p>Task 1 and 4 have been completed and the reports are on the network charts which follow. The near term position for operating reactors is to permit continued operation since, as noted above, damage attributed to water hammer has been relatively minor. The long-term aspect of Task 3, is an integral part of the resolution of this issue.</p> <p>Task 2 represents the resolution aspect of this USI and will result in the final resolution.</p>	<p>• RES INTERFACE INFORMATION</p> <p>None.</p>	<p>• TECHNICAL ASSISTANCE CONTRACTS</p> <p>Resolution efforts for A-1 are being conducted under FIN No. A6461 at INEL. Both EG&G-Idaho and Quadrex staff are being utilized.</p>	<p>• POTENTIAL PROBLEMS</p>																																																												
	<p>• ACRS INTERFACE INFORMATION</p> <p>A briefing on the status of, and proposed resolution of, USI A-1 was made to the full ACRS Committee on 08/31/83. The Committee accepted the scope utilized for resolution of A-1 but questioned whether sufficient attention had been given to the complicating effects of water hammer occurring in the course of abnormal events initiated by water hammer.</p>	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td>FY 81:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>A6461</td> <td>EG&G-Idaho</td> <td>\$120,000</td> <td>\$ 38,300</td> </tr> <tr> <td>FY 82:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>A6461</td> <td>EG&G-Idaho</td> <td>\$330,000</td> <td>\$263,000</td> </tr> <tr> <td>FY 83:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>A6461</td> <td>EG&G-Idaho</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Qtr. 1</td> <td>\$355,000</td> <td>\$277,000</td> </tr> <tr> <td></td> <td>Qtr. 2</td> <td>\$355,000</td> <td>\$250,000</td> </tr> <tr> <td></td> <td>Qtr. 3</td> <td>\$355,000</td> <td>\$282,000</td> </tr> <tr> <td></td> <td>Qtr. 4</td> <td>\$355,000</td> <td>\$286,000</td> </tr> <tr> <td>FY 84:</td> <td></td> <td></td> <td></td> </tr> <tr> <td>A6461</td> <td>EG&G-Idaho</td> <td></td> <td></td> </tr> <tr> <td></td> <td>Qtr. 1</td> <td>\$355,000</td> <td>\$294,200</td> </tr> <tr> <td></td> <td>Qtr. 2</td> <td>\$355,000</td> <td>\$289,800</td> </tr> </tbody> </table>	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	FY 81:				A6461	EG&G-Idaho	\$120,000	\$ 38,300	FY 82:				A6461	EG&G-Idaho	\$330,000	\$263,000	FY 83:				A6461	EG&G-Idaho				Qtr. 1	\$355,000	\$277,000		Qtr. 2	\$355,000	\$250,000		Qtr. 3	\$355,000	\$282,000		Qtr. 4	\$355,000	\$286,000	FY 84:				A6461	EG&G-Idaho				Qtr. 1	\$355,000	\$294,200		Qtr. 2	\$355,000	\$289,800	<p>• STATUS SUMMARY</p> <p>USI A-1 has been technically resolved. NUREG 0827, Rev. 1, "Evaluation of Water Hammer Occurrence in Nuclear Power Plants," March 1984 and NUREG-0853, Rev. 1, "Regulatory Analysis for USI A-1, Water Hammer," March 1984 have been issued. The staff's technical findings (NUREG-0827, Rev. 1) have been used to revise the following Standard Review Plan (SRP) Sections:</p> <p>3.9.3 ASME Code Class 1, 2, and 3 Components, Component Supports, and Core Support Structures</p> <p>3.9.4 Control Rod Drive Systems</p> <p>5.4.8 Reactor Core Isolation Cooling System (BWR)</p> <p>5.4.7 Residual Heat Removal (RHR) System</p> <p>6.3 Emergency Core Cooling System</p> <p>9.2.1 Station Service Water System</p> <p>9.2.2 Reactor Auxiliary Cooling Water Systems</p> <p>10.3 Main Steam Supply Systems</p> <p>10.4.7 Condensate and Feedwater Systems</p> <p>These changes reflect current water hammer findings and will ensure continued use of design features which have eliminated or minimized water hammer occurrence. Public comments received have been reflected in these SRP revisions. The revised SRPs would be used for review of "custom plant" Construction Permit (CP) applications and for reviews of Standard Plant applications docketed after issuance of the revision and which are intended for referencing in CP applications.</p>
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																																																												
FY 81:																																																															
A6461	EG&G-Idaho	\$120,000	\$ 38,300																																																												
FY 82:																																																															
A6461	EG&G-Idaho	\$330,000	\$263,000																																																												
FY 83:																																																															
A6461	EG&G-Idaho																																																														
	Qtr. 1	\$355,000	\$277,000																																																												
	Qtr. 2	\$355,000	\$250,000																																																												
	Qtr. 3	\$355,000	\$282,000																																																												
	Qtr. 4	\$355,000	\$286,000																																																												
FY 84:																																																															
A6461	EG&G-Idaho																																																														
	Qtr. 1	\$355,000	\$294,200																																																												
	Qtr. 2	\$355,000	\$289,800																																																												

**TASK 2.0
RESOLUTION OF A-1, WATER HAMMER**

WATER HAMMER (A-1)



WATER HAMMER (A-1) Continued



CONCLUDING USI A-1 REPORTS

- NUREG-0927, Rev. 1, "Evaluation of Water Hammer Occurrence in Nuclear Power Plants," March 1984.
- NUREG-0993, Rev. 1, "Regulatory Analysis for USI A-1, Water Hammer," March 1984.

TASK 1 REPORTS

- NUREG-0582, "Water Hammer in Nuclear Power Plants" July 1979
- Chapman, R.L., "Water Hammer Studies," EG&G Interim Rpt., CAAP-TR-053 (Rev. 1), July 1980 (Prepared for NRC Use)
- NUREG/CR-2059, "Compilation of Actual and Suspected Water Hammer Events in Nuclear Power Plants," May 1982.

TASK 2 REPORT

- NUREG/CR-2781, "Evaluation of Water Hammer Events in Light Water Reactor Plants," July 1982.

TASK 4.1 REPORT

- Chapman, R.L., et al., "Review and Evaluation of Actual and Potential Water Hammer Events in Nuclear Plants," EG&G Interim Rpt., CAAP-TR-042 (Rev. 1), September 1979 (Prepared for NRC Use)

TASK 4.2 REPORT

- Watkins, J.C., Berry, R.A., "A State-of-the-Art Literature Review of Water Hammer," EG&G Interim Rpt., RE-A-70-044, April 1979 (Prepared for NRC Use)

TASK 4.3 REPORT

- Saha, P., et al., "An Evaluation of Condensation-Induced Water Hammer in Preheat Steam Generators," NUREG/CR-1606, September 1980

TASK 4.4 REPORTS

- Williamson, R.L., "An Analysis Tool for Predicting Line Transient Hydrodynamics Resulting from the Rapid Filling of Voided Piping Systems," EG&G Interim Rpt. RE-E-79-009, February 1979 (Prepared for NRC Internal Use)
- Morton, D.K., "An Analytical Procedure for Performing Structural Analyses of Nuclear Piping Systems Subjected to Fluid Transients," EG&G Interim Rpt., RE-E-79-013, February (Prepared for NRC Internal Use)

- Damma, P.N., "An Investigation of the Steam Void Collapse Water Hammer Initiating Mechanism," EG&G Interim Rpt., RE-A-78-229, February 1979 (Prepared for NRC Internal Use)

- Berry, R.A., "An Analysis Tool for Predicting Transient Hydrodynamics in Nuclear Piping Systems Containing Swing Check Valves," EG&G Rpt. RE-A-78-261 (Rev. 2), September 1979 (Prepared for NRC Internal Use)

TASK 4.5 REPORT

- Saffell, B.F., "Supplemental Water Hammer Analysis and System Review," EG&G preliminary Rpt. EGG-CAAP-5133, July 1980 (Prepared for NRC for Use as a Preliminary or Working Document)

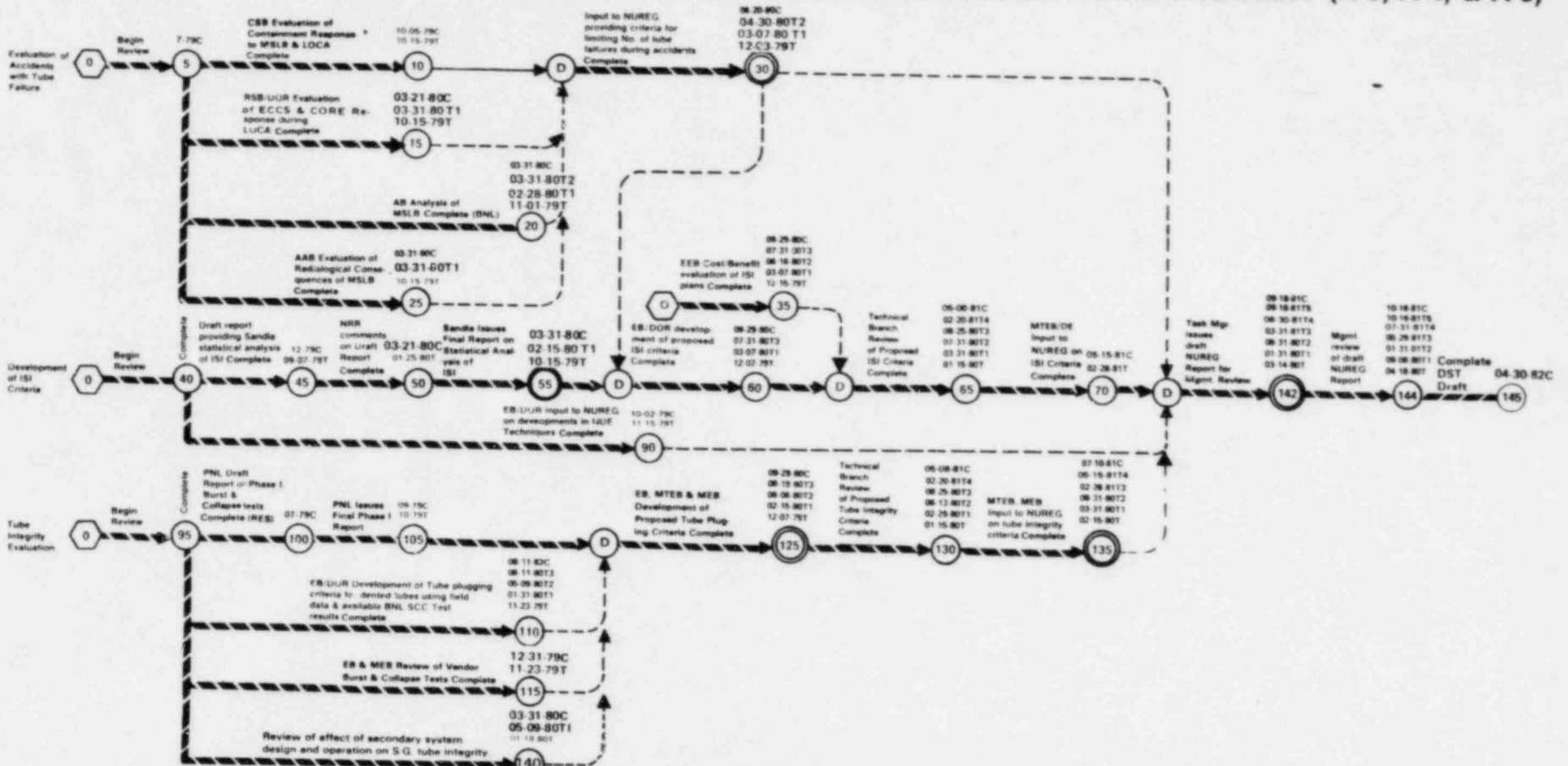
WEST., CE & B&W STEAM GENERATOR TUBE INTEGRITY (A-3, A-4, A-5)

AS OF WEEK ENDING

MAY 18, 1984

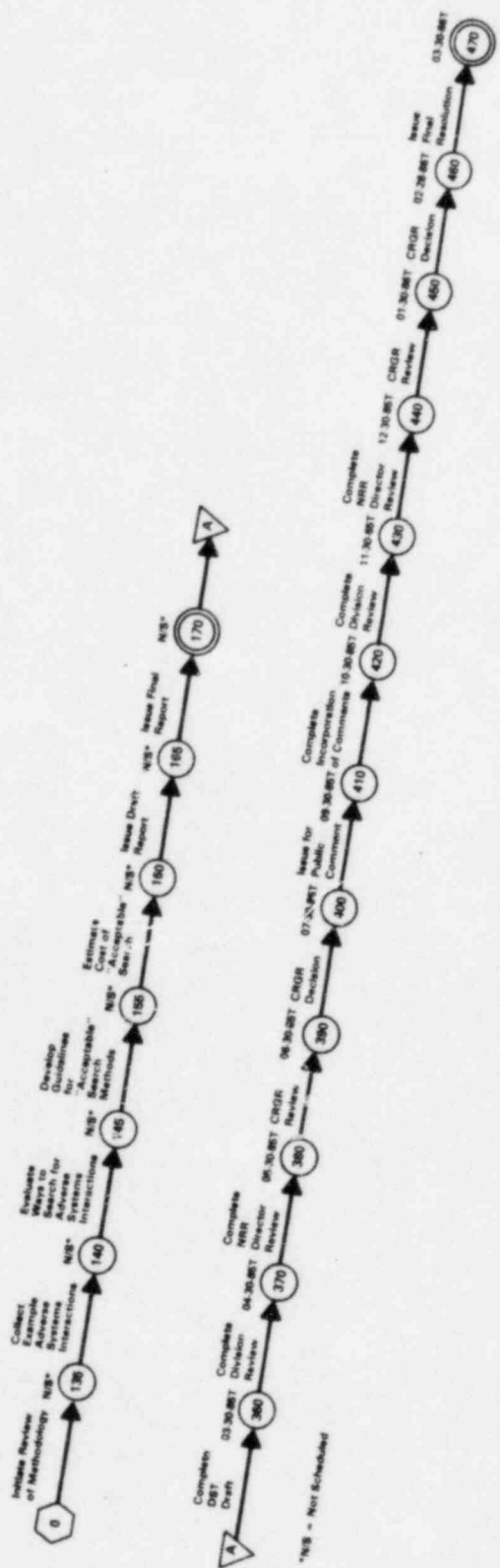
KEY PERSONNEL		TASK REVIEWERS		SCHEDULED COMPLETION														
TASK MANAGER J. STROSNIDER X75903 <i>J. Strosnider</i> NRR ANALYST JUDY BUTTS X24822		NAME BRANCH J. STROSNIDER MEB/RES W. PASEDAG AEB/DSI C. PARSZEWSKI CEB/DE		J. RAJAN MEB/DE B. TUROVLIN CEB/DE F. ODAR ADB/RSR F. AKSTULEWICZ AER/DSI L. FRANK MTEB/DE		1978 ANNUAL REPORT <u>Early 1980</u> CURRENT <u>May 1984</u>												
• PROBLEM DESCRIPTION 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 propagating 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.		• RES INTERFACE INFORMATION 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.		• TECHNICAL ASSISTANCE CONTRACTS 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 in-service 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.		• POTENTIAL PROBLEMS The ACRS letter dated October 18, 1983 stated that the proposals should be recommended industry actions and not new requirements.												
		• ACRS INTERFACE INFORMATION 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>\$96,000</td> <td>\$96,000</td> </tr> </tbody> </table>		FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	2314	PNL	\$75,000	\$75,000	82315	PNL	\$96,000	\$96,000	• STATUS SUMMARY 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 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, A-4, A-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 USI 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 June 1984.
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED															
2314	PNL	\$75,000	\$75,000															
82315	PNL	\$96,000	\$96,000															

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



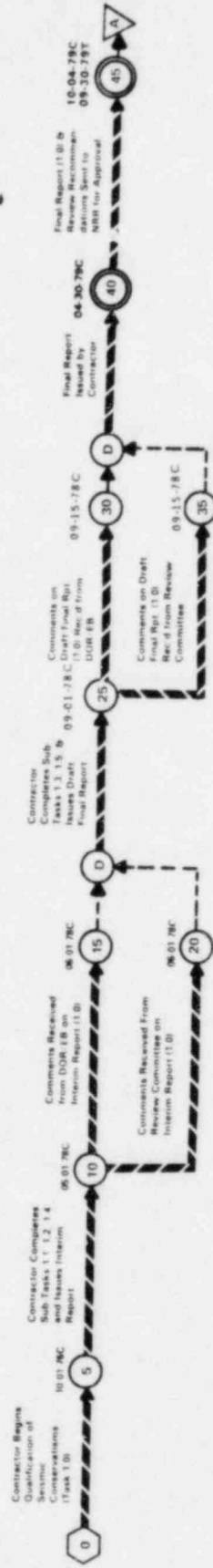
FINAL REPORT AND SCHEDULE SUPERCEDED BY TASK REPORT – SEE STATUS SUMMARY

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

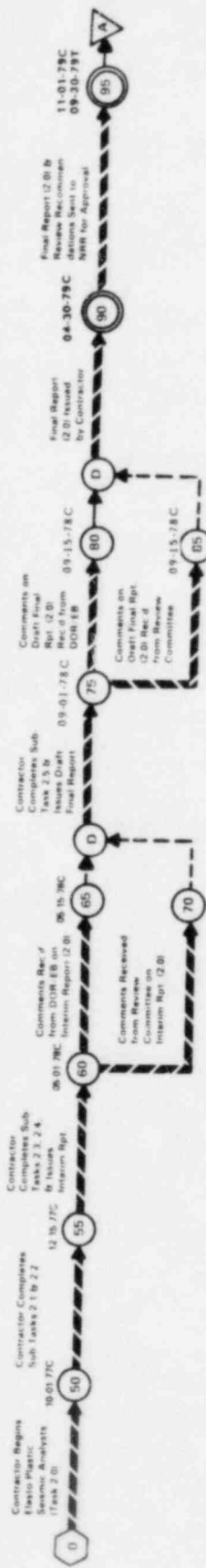


SEISMIC DESIGN CRITERIA - SHORT TERM PROGRAM (A-40)

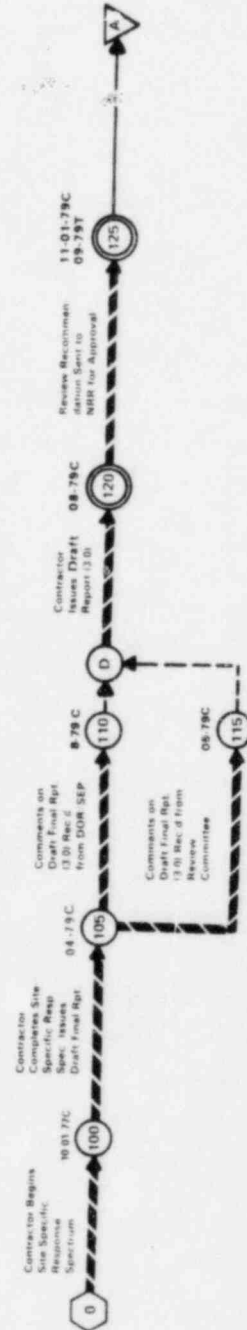
Phase 1



Task 1
Qualification of Seismic Conservations



Task 2
Elasto-Plastic Seismic Analysis

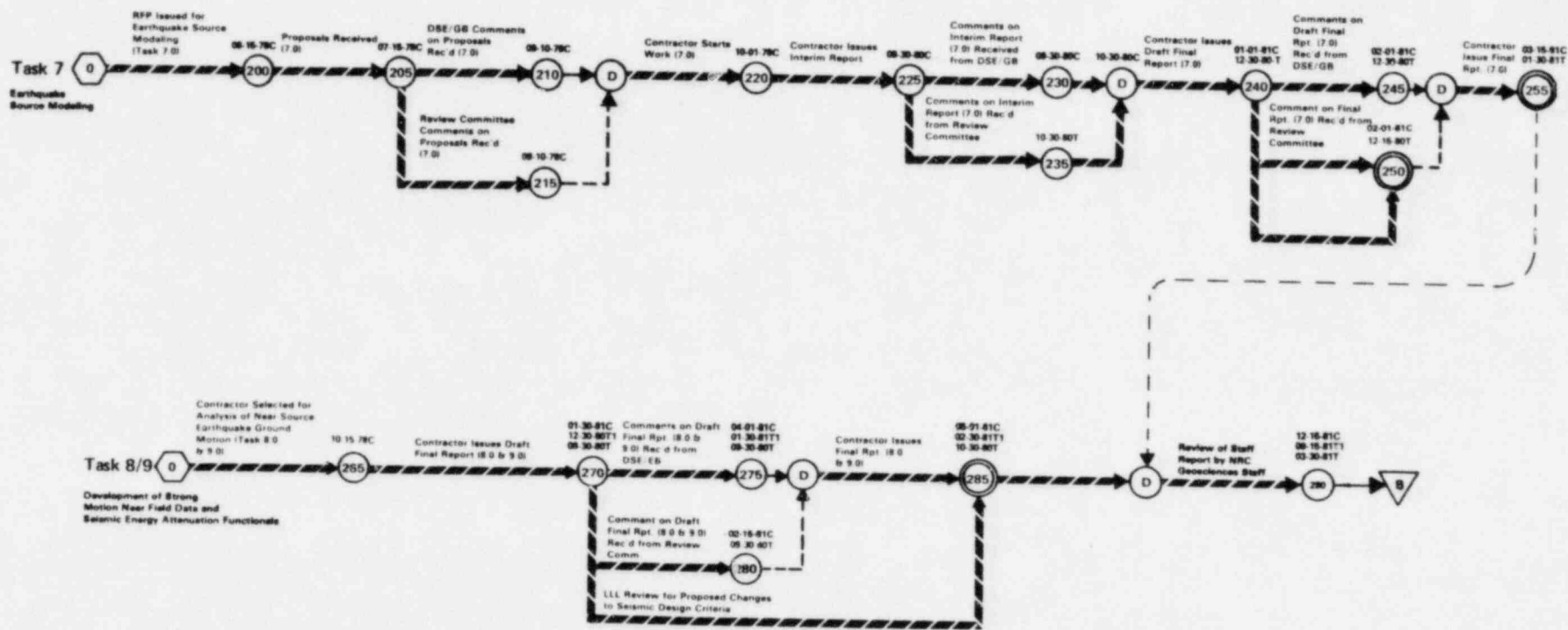


Task 3
Site Specific Response Spectra

Task 4 Deleted
Seismic After Shocks

Phase 2

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



CONTAINMENT EMERGENCY SUMP PERFORMANCE (A-43)

AS OF WEEK ENDING

MAY 18, 1984

KEY PERSONNEL	TASK REVIEWERS	SCHEDULED COMPLETION																																																					
TASK MANAGER A SERKIZ X24217 <i>Ann Butts 5/18/84</i> NRN ANALYST JUDY BUTTS X24822	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>NAME</th> <th>BRANCH</th> </tr> </thead> <tbody> <tr> <td>S. DIAB</td> <td>RSB/DSI</td> </tr> <tr> <td>P. NORIAN</td> <td>GIB/DSI</td> </tr> <tr> <td>W. BUTLER</td> <td>CSB/DGI</td> </tr> </tbody> </table>	NAME	BRANCH	S. DIAB	RSB/DSI	P. NORIAN	GIB/DSI	W. BUTLER	CSB/DGI	ORIGINAL <u>April 1982</u> CURRENT <u>09-30-84</u>																																													
NAME	BRANCH																																																						
S. DIAB	RSB/DSI																																																						
P. NORIAN	GIB/DSI																																																						
W. BUTLER	CSB/DGI																																																						
<p>• PROBLEM DESCRIPTION</p> <p>Following a Loss of Coolant Accident (LOCA) in a PWR, water flowing from the break in the primary system would collect on the floor of containment. During the injection mode, water for core cooling and containment spray is drawn from a large supply tank. When the water reached a low level in the tank, pumps are realigned to draw from the containment. This is called the recirculation mode wherein water is drawn from the containment floor or sump and pumped to the primary system or containment spray headers. This program addresses the safety issue of adequate sump or suppression pool function in the recirculation mode. It is the objective of this program to develop improved criteria for design, testing, and evaluation which will provide better assurance that emergency sumps will function to satisfy system requirements.</p> <p>The principal concerns are somewhat interrelated but are best discussed separately. One deals with the various kinds of insulation used on piping and components inside of containment. The concern being that break-initiated debris from the insulation could cause blockage of the sump or otherwise adversely affect the operation of the pumps, spray nozzles, and valves of the safety systems.</p> <p>The second deals with the hydraulic performance of the sump as related to the hydraulic performance to safety systems supplied therefrom. Preoperational tests have been performed on a number of plants to demonstrate operability in the recirculation mode. Adverse flow conditions have been encountered requiring design and procedural modifications to eliminate them. These conditions, air entrainment, cavitation, and vortex formation, are aggravated by blockage. If not avoided or suppressed, they could result in pump failure during the long term cooling phase following a LOCA.</p> <p>The concerns relative to debris, blockage, and hydraulic performance also apply to boiling water reactors during recirculation from the suppression pools, and will also be addressed.</p>	<p>• RES INTERFACE INFORMATION</p> <p>None. USI A-43 being managed by the Generic Issues Branch (GIB).</p>	<p>• TECHNICAL ASSISTANCE CONTRACTS</p> <p>FIN No. A1237, "Containment Emergency Sump Performance", and FIN No. A1296, "Technical Assistance for Resolution of USI A-43", are being funded by RES and NRN respectively. This work is managed by the GIB Task Manager and these combined efforts are expected to be concluded in FY 84.</p> <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td colspan="4">FY 81:</td> </tr> <tr> <td>A1237</td> <td>Sandia</td> <td>\$225,000</td> <td>\$101,000</td> </tr> <tr> <td>A1296</td> <td>Sandia</td> <td>\$120,000</td> <td>\$ 75,100</td> </tr> <tr> <td colspan="4">FY 82:</td> </tr> <tr> <td>A1237</td> <td>Sandia</td> <td>\$327,000</td> <td>\$327,000</td> </tr> <tr> <td>A1296</td> <td>Sandia</td> <td>\$400,000</td> <td>\$281,000</td> </tr> <tr> <td colspan="4">FY 83:</td> </tr> <tr> <td rowspan="4">A1296</td> <td rowspan="4">Sandia</td> <td>Qtr 1</td> <td>\$425,000</td> </tr> <tr> <td>Qtr 2</td> <td>\$440,000</td> </tr> <tr> <td>Qtr 3</td> <td>\$467,000</td> </tr> <tr> <td>Qtr 4</td> <td>\$505,000</td> </tr> <tr> <td colspan="4">FY 84:</td> </tr> <tr> <td rowspan="2">A1296</td> <td rowspan="2">Sandia</td> <td>Oct. 83</td> <td>\$505,000</td> </tr> <tr> <td>Nov. 83</td> <td>\$505,000</td> </tr> </tbody> </table>	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	FY 81:				A1237	Sandia	\$225,000	\$101,000	A1296	Sandia	\$120,000	\$ 75,100	FY 82:				A1237	Sandia	\$327,000	\$327,000	A1296	Sandia	\$400,000	\$281,000	FY 83:				A1296	Sandia	Qtr 1	\$425,000	Qtr 2	\$440,000	Qtr 3	\$467,000	Qtr 4	\$505,000	FY 84:				A1296	Sandia	Oct. 83	\$505,000	Nov. 83	\$505,000	<p>• POTENTIAL PROBLEMS</p> <p>Schedule review by CRGR could lead to further technical evaluations and schedule delays.</p>
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																																																				
FY 81:																																																							
A1237	Sandia	\$225,000	\$101,000																																																				
A1296	Sandia	\$120,000	\$ 75,100																																																				
FY 82:																																																							
A1237	Sandia	\$327,000	\$327,000																																																				
A1296	Sandia	\$400,000	\$281,000																																																				
FY 83:																																																							
A1296	Sandia	Qtr 1	\$425,000																																																				
		Qtr 2	\$440,000																																																				
		Qtr 3	\$467,000																																																				
		Qtr 4	\$505,000																																																				
FY 84:																																																							
A1296	Sandia	Oct. 83	\$505,000																																																				
		Nov. 83	\$505,000																																																				
	<p>• ACRS INTERFACE INFORMATION</p> <p>The ACRS full Committee was briefed on the resolution status of A-43 and the comments received on 08/31/83. Committee members raised questions regarding BWR recirculation pump bearings and seals ingesting particulates and the effect thereof. In addition, the Committee cautioned against hasty or generalized application of the leak before break concept to other issues without a very thorough analysis and review.</p>		<p>• STATUS SUMMARY</p> <p>NUREG-0007, "Containment Emergency Sump Performance" and NUREG-0008, "USI A-43 Regulatory Analysis" have been revised to reflect comments received during the "For Comment" period and have received staff review. The current schedule calls for submitting the A-43 resolution to the CRGR in May 1984.</p>																																																				

CONTAINMENT EMERGENCY SUMP PERFORMANCE (A-43)

NOTE: The 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 in the final preparation stage.

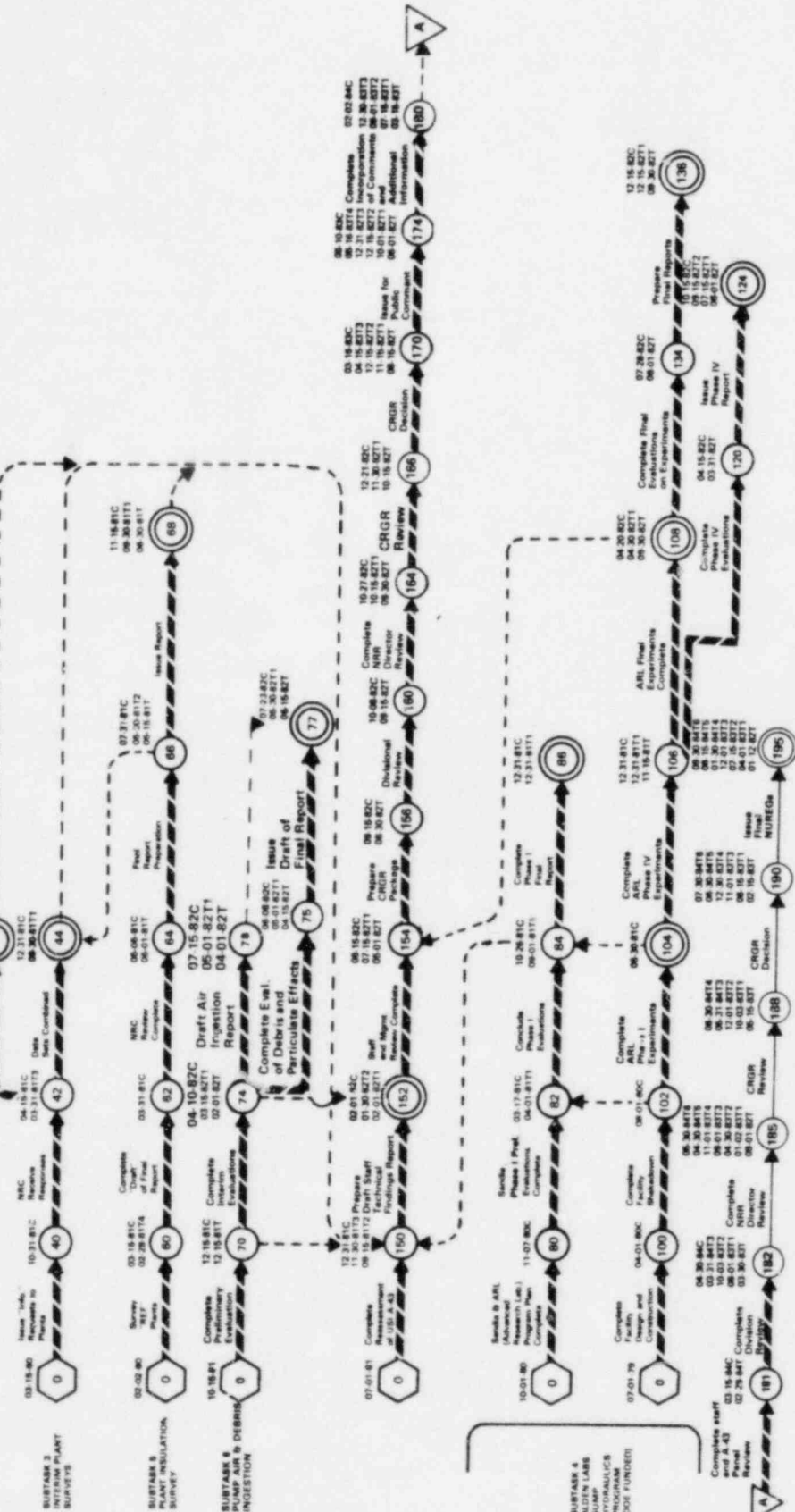
NOTE: Subtask 2 has been deleted since findings presented in this flows report are superseded by experimental results from Subtask 4.

SUBTASK 1
PWR RECIRCULATION
TESTS REPORT

SUBTASK 2
REPAIRS
REPORT

SUBTASK 3
PLANT INSULATION
SURVEY

SUBTASK 4
ALVIN LABS
SUMP
PERFORMANCE
PROGRAM
(OOE FUNDED)



STATION BLACKOUT (A-44)

AS OF WEEK ENDING

MAY 18, 1984

KEY PERSONNEL

TASK MANAGER

ALAN RUBIN X28903
PAT BARANOWSKY X37632

Alan Rubin

NRR ANALYST

JUDY BUTTS X24822

TASK REVIEWERS

NAME BRANCH

R. ANAND ASB/DSI

L. ENGLE ORB/DI

O. CHOPRA PSB/DSI

D. LANGFORD RSB/DSI

S. NEWBERRY RRAB/DST

SCHEDULED COMPLETION

ORIGINAL JUNE 1982

CURRENT 02-15-86

• PROBLEM DESCRIPTION

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.

• RES INTERFACE INFORMATION

RES is providing technical assistance for the resolution of A-44.

• ACRS INTERFACE INFORMATION

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.

• TECHNICAL ASSISTANCE CONTRACTS

ORNL FIN 80744 \$740K - 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-3226, "Station Blackout Accident Analyses (Part of NRC Task Action Plan A-44)," was published in May 1983.

FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED*
# 80744	ORNL	\$740K	\$694K
A1302	SNL	\$300K	\$282K

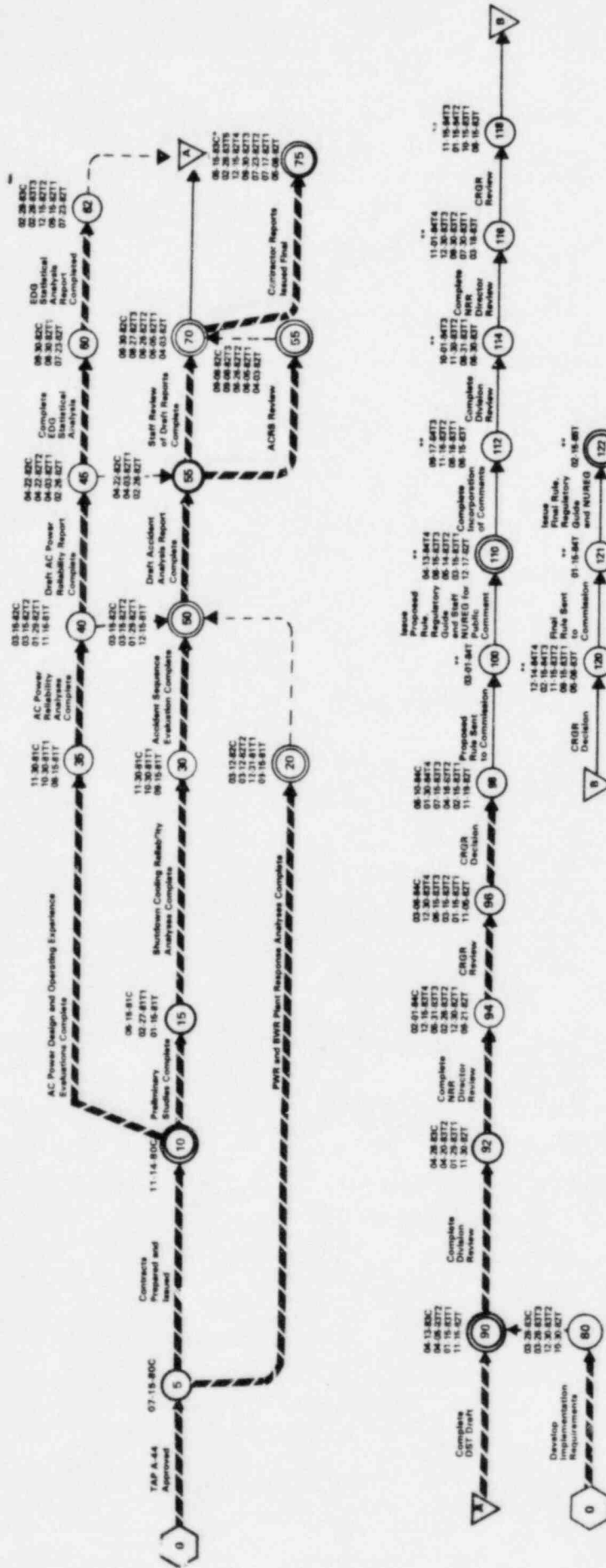
* As of February 29, 1984.

• POTENTIAL PROBLEMS

• STATUS SUMMARY

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.

STATION BLACKOUT (A-44)



* Accident Analysis Report and EDG Reliability Report were published in November 1983.
 Draft Loss of Offsite Power Report is to be issued in July 1984.
 ** A revised schedule is under development.

SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS (A-45)

AS OF WEEK ENDING

MAY 18, 1984

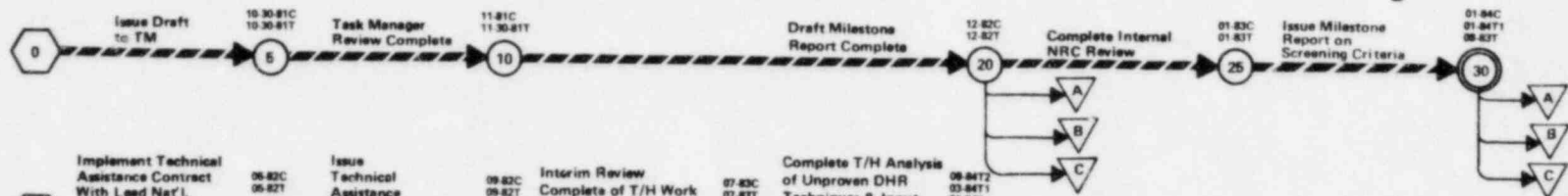
KEY PERSONNEL	TASK REVIEWERS	E. McPEEK	SSPB/DL	SCHEDULED COMPLETION
TASK MANAGER ANDREW MARCHESE X24712 <i>P. Novak to A. Marchese</i>	NAME BRANCH	D. DIANNI	ORB-4/DL	
NRR ANALYST JUDY BUTTS X24822	T. MARSH RSB/DSI	M. CUNNINGHAM	DRS/RES	CURRENT 10-30-85
	F. ROSA ICSB/DSI	R. FRAHM	RRAB/DST	
	M. SRINIVASAN PSB/DSI	P. HEARN	ASB/DSI	

• PROBLEM DESCRIPTION	• RES INTERFACE INFORMATION	• TECHNICAL ASSISTANCE CONTRACTS	• POTENTIAL PROBLEMS																
<p>Task A-45 was approved as a USI by the NRC in December 1980.</p> <p>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).</p> <p>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 shutdown 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.</p> <p>The main objectives of the program are as follows:</p> <ul style="list-style-type: none"> - 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. <p>The interrelation and relative timing of each of the program sub-tasks are shown on the schedule network.</p>	<p>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 the 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 Pipe Out," 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 LOCAs. This will also include performing in-house, contractor-detailed thermal-hydraulics analyses where required to support existing and improved decay heat removal systems behavior under transient and accident conditions.</p>	<p>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.</p> <p>Implemented a technical assistance contract on May 10, 1982 with Sandia (FIN A1308) to provide overall project management, technical direction and integration for the entire Task A-45 program, including selection and management of subcontractors.</p>	<p>Potential problem areas identified to date are:</p> <ul style="list-style-type: none"> - 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 DHR 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. - Close coordination and cooperation needed within NRR and between NRR and RES. - 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. 																
<p>The main objectives of the program are as follows:</p> <ul style="list-style-type: none"> - 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. <p>The interrelation and relative timing of each of the program sub-tasks are shown on the schedule network.</p>	<p>• ACRS INTERFACE INFORMATION</p> <ul style="list-style-type: none"> - Task Manager briefed the full committee on July 9, 1982 on the present plans and content of the A-45 Task Action Plan (TAP). - ACRS Subcommittee on Decay Heat Removal Systems (DHRs) met on March 20-21, 1984, and Task Manager provided the subcommittee with an update of the A-45 program. - Further meetings with the full committee and subcommittee on DHRs will be held as the work on A-45 progresses and certain pre-determined milestones are completed. 	<table border="1"> <thead> <tr> <th>FIN NO.</th> <th>CONTRACTOR</th> <th>OBLIGATED</th> <th>EXPENDED</th> </tr> </thead> <tbody> <tr> <td>B6536</td> <td>UCLA</td> <td>\$ 10,000</td> <td>\$ 10,000</td> </tr> <tr> <td>A3381</td> <td>BNL</td> <td>\$ 100,000</td> <td>\$ 100,000</td> </tr> <tr> <td>A1308</td> <td>Sandia</td> <td>\$3,669,000</td> <td>\$3,064,000*</td> </tr> </tbody> </table> <p>* Includes the following funding which has been committed to support subcontracting:</p> <ul style="list-style-type: none"> UCLA \$226,000 ORNL \$431,000 BWR \$ 32,000 LANL \$107,000 ASAI \$100,000 SAI/SEA \$ 56,000 	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	B6536	UCLA	\$ 10,000	\$ 10,000	A3381	BNL	\$ 100,000	\$ 100,000	A1308	Sandia	\$3,669,000	\$3,064,000*	<p>• STATUS SUMMARY</p> <ul style="list-style-type: none"> Revision 3 of TAP A-45 was issued in March 1984 for Division review and comment. The eighth contractor draft interim milestone report entitled, "Los Alamos PWR Decay Heat Removal Studies Summary Results and Conclusions" has been issued for staff comment. This report provides feed and bleed analyses and results for specific plant transients in B&W, CE and Westinghouse plants. On April 10, 1984, the staff met with the BWR owners group to discuss their proposed concept for using containment venting as an emergency means of decay heat removal. Staff concerns were discussed, and a meeting summary has been issued. In a memorandum to the Director, NRR, dated April 13, 1984, DST requested and documented the need for a 4-month schedule slip in the USI A-45 program. A subcontract for architect/engineer support to perform feasibility and impact (or cost) assessments of alternative DHR measures has been awarded in a competitive bid process to United Engineers & Constructors. Establishment of the A-45 Industry Peer Review Group is nearly complete. All four N555 vendors and each of the owners groups will participate.
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																
B6536	UCLA	\$ 10,000	\$ 10,000																
A3381	BNL	\$ 100,000	\$ 100,000																
A1308	Sandia	\$3,669,000	\$3,064,000*																

SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS (A-45)

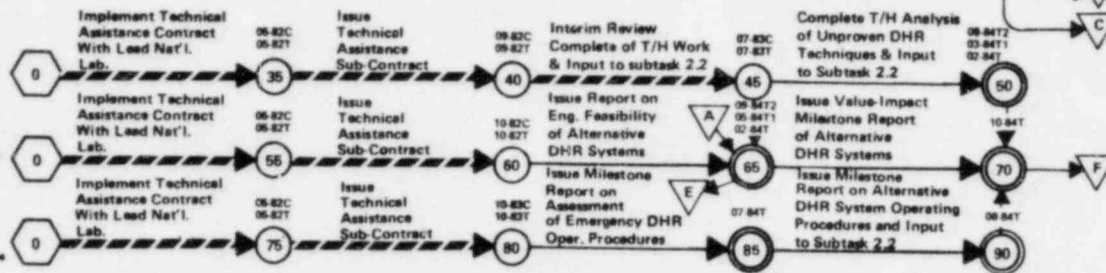
TASK 1. DEVELOP SCREENING CRITERIA FOR DHRS

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



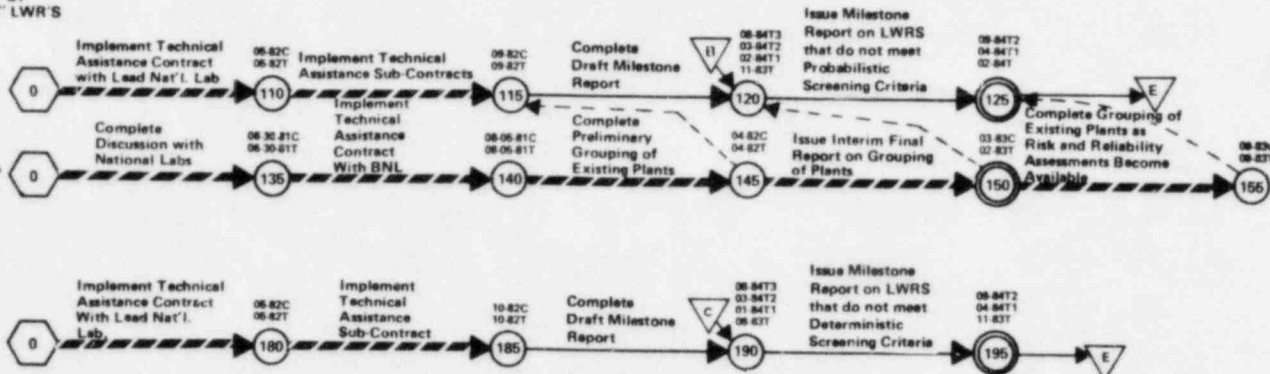
TASK 2. DEV. MEANS FOR IMPROVEMENT OF DHRS

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



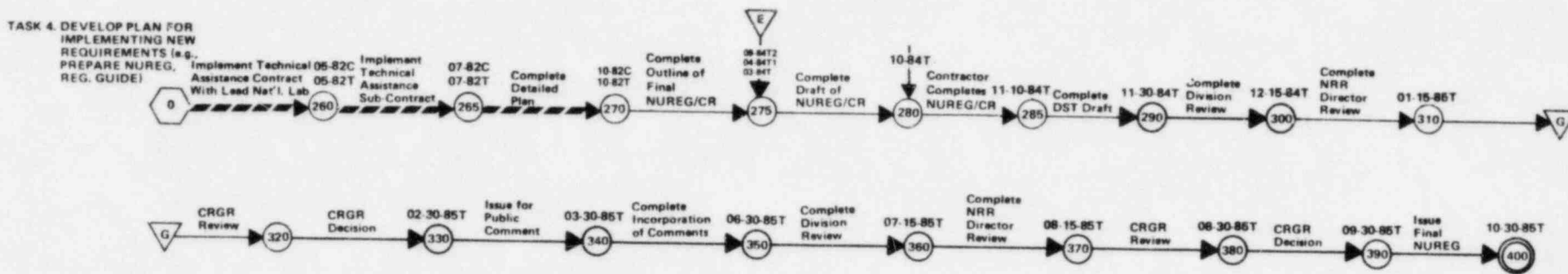
TASK 3. ASSESS ADEQUACY OF DHRS IN "EXISTING" LWR'S

- 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



SHUTDOWN DECAY HEAT REMOVAL REQUIREMENTS (A-45)

CONTINUED



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

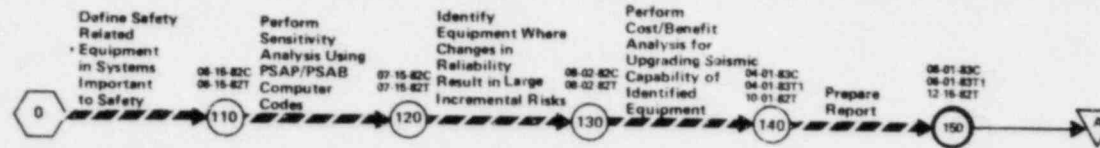
AS OF WEEK ENDING

MAY 18, 1984

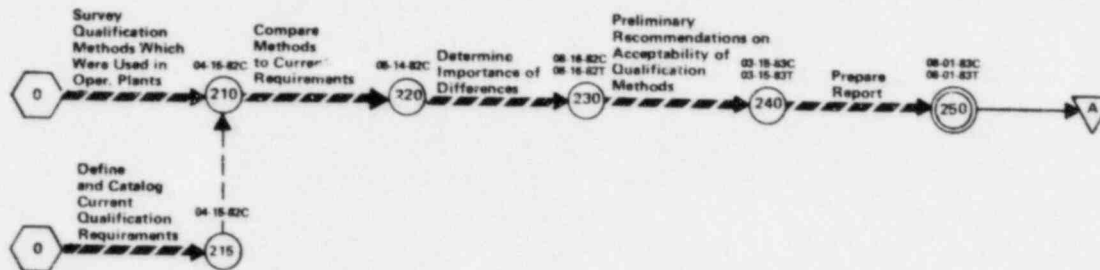
KEY PERSONNEL	TASK REVIEWERS	FRANK SKOPEC RAB/DSI	SCHEDULED COMPLETION																
TASK MANAGER T. Y. CHANG X27466 <i>T2-17 Clp</i>	NAME BRANCH	# KULIN DESAI R5B/DSI	ORIGINAL 12-15-83																
NRR ANALYST JUDY BUTTS X24822	# ARNOLD LEE EQB/DE	# HAROLD POLK SGB/DE	CURRENT # 02-15-86																
PEI-YING CHEN SEPB/DL	JOHN KNOX PSB/DSI	# GUSTAAF GIESE KOCH GSB/DE																	
# GERALD WEIDENHAMER MSEB/RES																			
• PROBLEM DESCRIPTION Task A-46 was approved as a USI by the NRC December, 1980. 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. A breakdown of the tasks is as follows: 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	• RES INTERFACE INFORMATION 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. • ACRS INTERFACE INFORMATION 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.	• TECHNICAL ASSISTANCE CONTRACTS Task 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-3268 on Task 5 was issued in September 1983. A draft guideline on Task 1 was issued in September 1983. Task 3 was performed by Idaho National Engineering Laboratory. A draft technical report was issued in December 1982, and preliminary guidance and acceptance criteria for the use of in-situ test methods were issued in April 1983. Additional technical findings and the updated guidance and acceptance criteria were issued by INEL to the staff in October 1983. Task 4 has been studied independently by Lawrence Livermore National Laboratory and by the Seismic Qualification Utility Group. Reports were issued in November 1982 and September 1982, respectively.	• POTENTIAL PROBLEMS None.																
		<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>A0476</td> <td>INEL</td> <td>\$275K</td> <td>\$282K (est)</td> </tr> <tr> <td>A3287</td> <td>BNL</td> <td>\$324K</td> <td>\$320K (est)</td> </tr> </tbody> </table>	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	A0423	LLNL	\$75K	\$75K	A0476	INEL	\$275K	\$282K (est)	A3287	BNL	\$324K	\$320K (est)	• STATUS SUMMARY 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. An interim report was issued as NUREG 1018 in October 1983, which summarizes the status of work accomplished on USI A-46 by the NRC staff and its contractors. # 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 May 1984.
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																
A0423	LLNL	\$75K	\$75K																
A0476	INEL	\$275K	\$282K (est)																
A3287	BNL	\$324K	\$320K (est)																

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

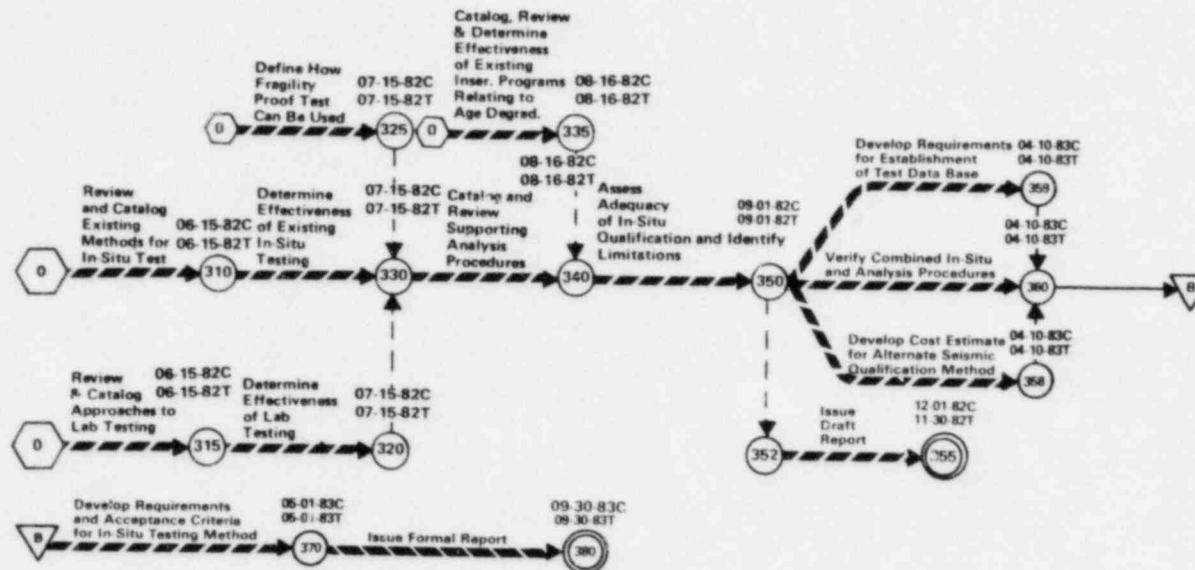
Task 1:
Identification of Seismic Sensitive Systems & Equipment



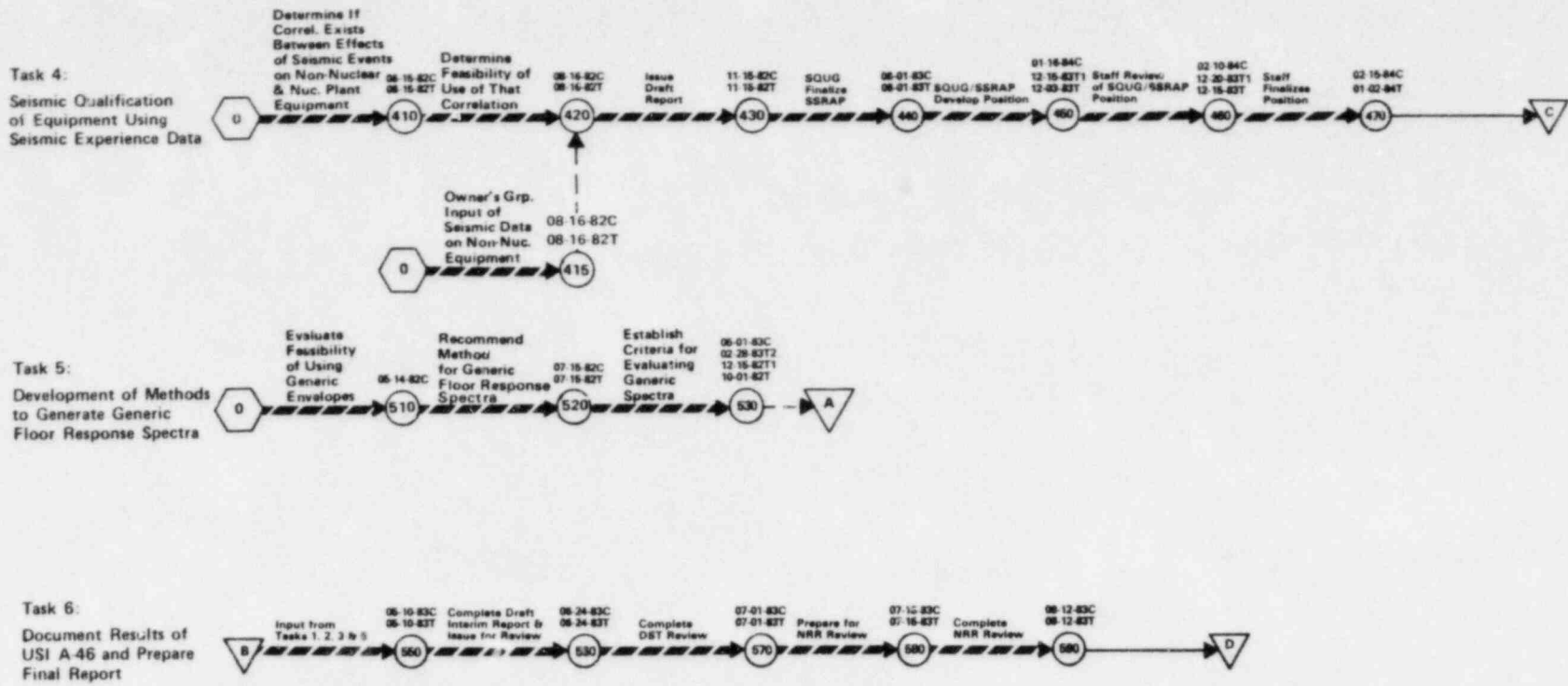
Task 2:
Assessment of Adequacy of Existing Seismic Qualification



Task 3:
Development and Assessment of In-Situ Testing Methods to Assist in Qualification of Equipment

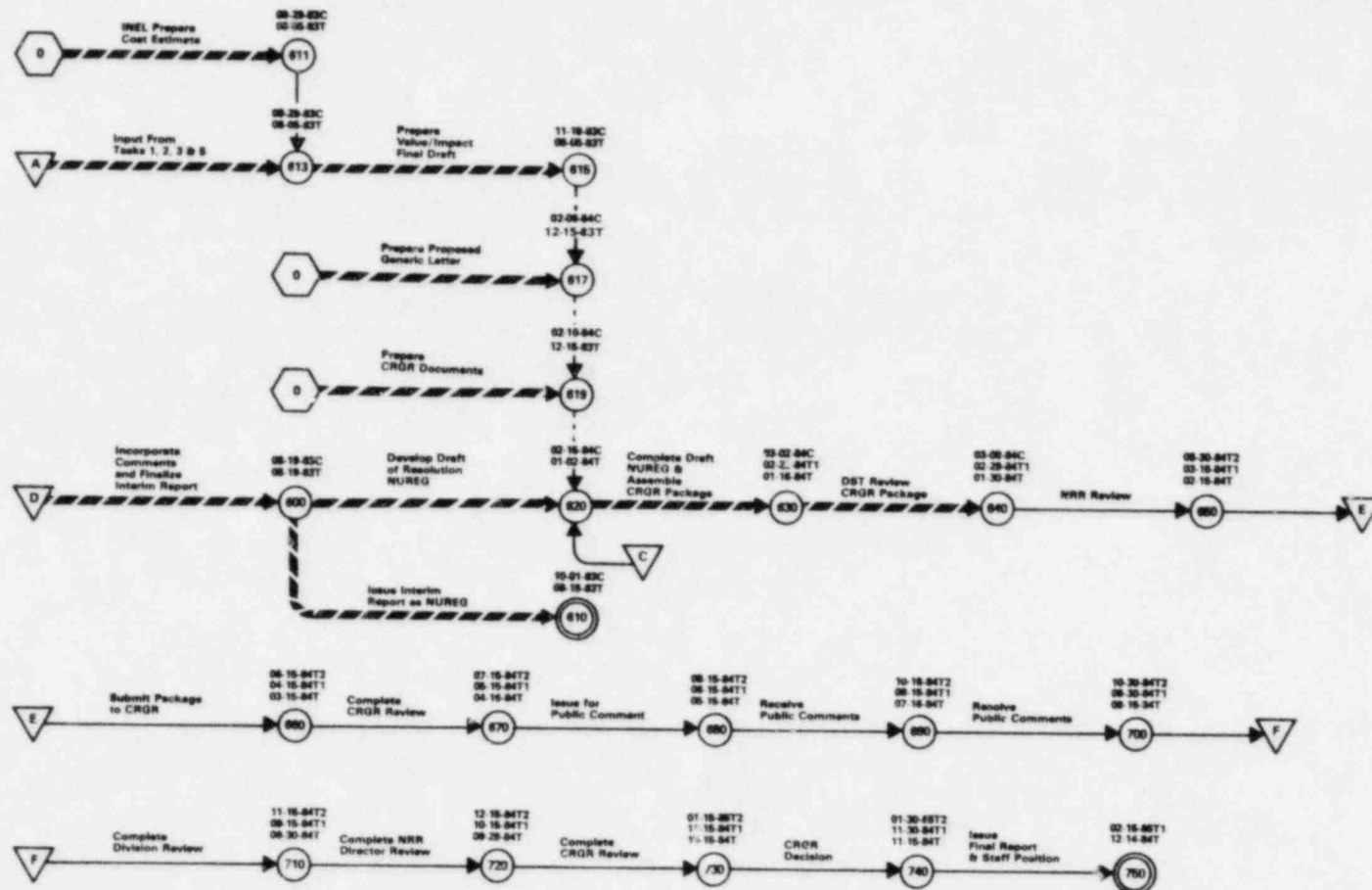


SEISMIC QUALIFICATION OF EQUIPMENT IN OPERATING PLANTS (A-46) CONTINUED



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

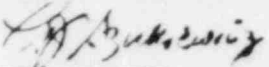
Task 6
(Continued)



SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47)

AS OF WEEK ENDING

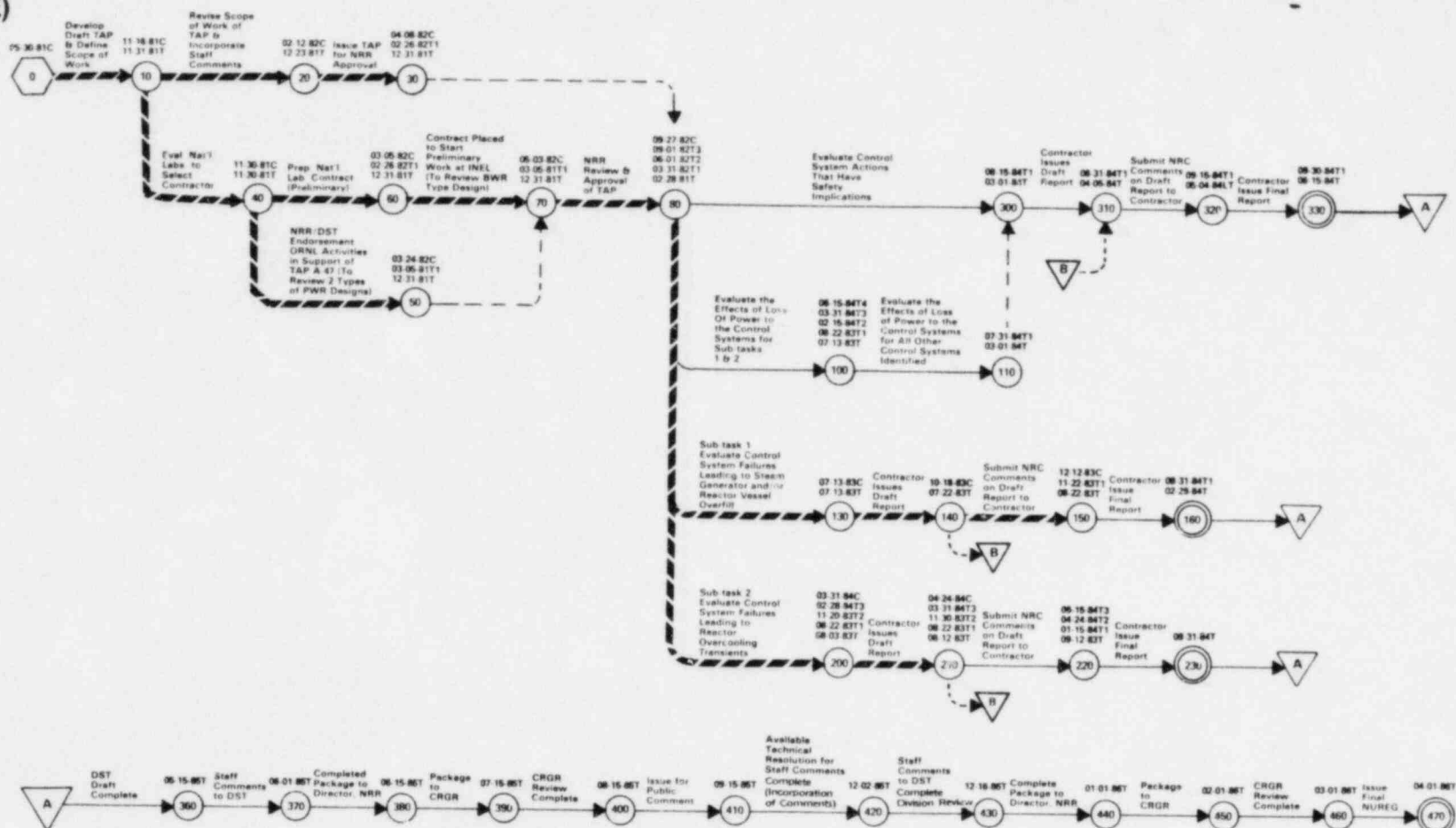
MAY 18, 1984

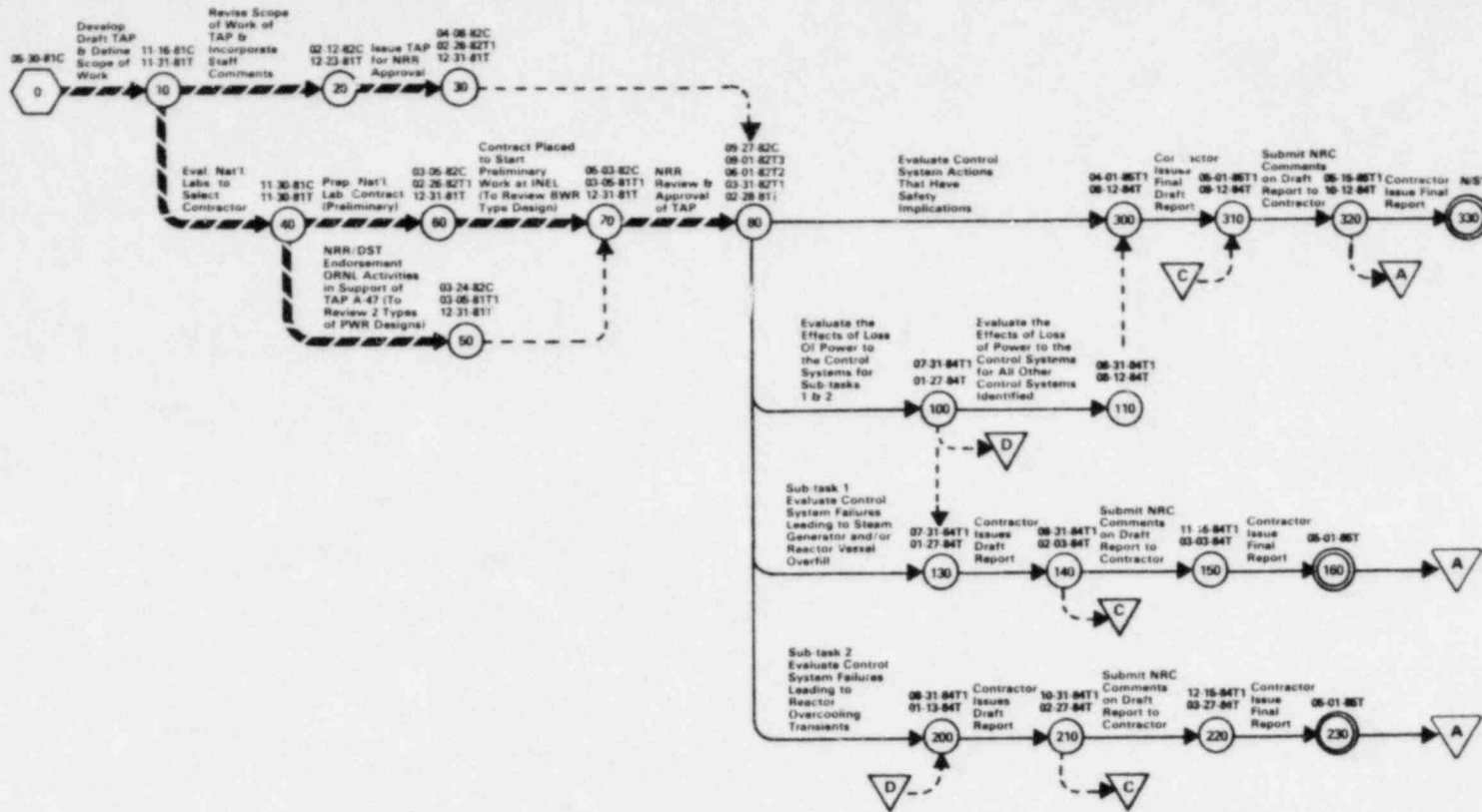
KEY PERSONNEL		TASK REVIEWERS		S. DIAB	RSB/DSI	SCHEDULED COMPLETION	
TASK MANAGER ANDREW SZUKIEWICZ X24713 		NAME BRANCH		M. CHIRAMAL	PSU/AEOD	ORIGINAL	01-30-86
NRR ANALYST JUDY BUTTS X24822		D. BASDEKAS	DFO/RES	J. T. BEARD	ORAB/DL	CURRENT	* 04-01-86
		J. CALVO	ICSB/DSI	W. KENNEDY	PTRB/DHFS		
		E. CHELLIAH	RRAB/DSI				

• PROBLEM DESCRIPTION	• RES INTERFACE INFORMATION	• TECHNICAL ASSISTANCE CONTRACTS	• POTENTIAL PROBLEMS												
<p>Task A-47 was approved as a USI by the NRC in December 1980.</p> <p>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.</p>	<p>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.</p>	<p>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:</p> <ol style="list-style-type: none"> 1. Evaluate Control System Failures Leading to Steam Generator and/or Reactor Overfill Transients 2. Evaluate Control System Failures Leading to Reactor Overcooling Transients 3. Evaluate (All Others) Control System Actions That Have Safety Implications 4. Evaluate the Effects of Loss of Power to the Control Systems 	<p>Obtain necessary operating experience information on Non-Safety Control Systems for the Nuclear Steam System (NSS) and the Balance of Plant (BOP) systems.</p> <p>Obtain necessary design information (i.e., schematics and systems descriptions) for the Non-Safety Control System designs for the NSS and the BOP designs.</p> <p>Traditionally, licensees were not required to provide design or operating experience on Non-Safety Systems and therefore this information may be difficult to obtain.</p> <p>Availability of the SGB/E simulator for the Calvert Cliffs 1 evaluation is scheduled to begin in October 1984.</p>												
	<p>• ACRS INTERFACE INFORMATION</p> <p>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 Ahearn.</p> <p>Elements of conceptual Task Action Plan were discussed with ACRS on 06-07-81.</p> <p>Status of the activities identified in TAP A-47 was discussed with the ACRS Subcommittee on December 21, 1982 and November 16, 1983.</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-6477</td> <td>INEL</td> <td>\$1,366,000</td> <td>\$860,000</td> </tr> <tr> <td>B-0467 and B-0616</td> <td>ORNL</td> <td>\$3,660,000</td> <td>\$2,061,566</td> </tr> </tbody> </table> <p>* through FY 84 ** through December 1983</p>	FIN NO.	CONTRACTOR	OBLIGATED*	EXPENDED**	A-6477	INEL	\$1,366,000	\$860,000	B-0467 and B-0616	ORNL	\$3,660,000	\$2,061,566	<p>• STATUS SUMMARY</p> <p>The Westinghouse PWR design review at INEL was started February 1, 1983.</p> <p>Draft reports on the overfill and overcooling transients for the GE review were submitted by INEL for staff review in August 1983.</p> <p>Draft reports on the overfill and overcooling transients and other transients for the Westinghouse review were submitted by INEL for staff review in January 1984.</p> <p>A draft report on the overfill transient for the B&W review was submitted by ORNL in October 1983.</p> <p>A revised schedule which addresses delays experienced has been approved by the Director, NRR.</p> <p>A draft report on overcooling transients for the B&W review was submitted by ORNL in April 1983.</p>
FIN NO.	CONTRACTOR	OBLIGATED*	EXPENDED**												
A-6477	INEL	\$1,366,000	\$860,000												
B-0467 and B-0616	ORNL	\$3,660,000	\$2,061,566												

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

SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47)

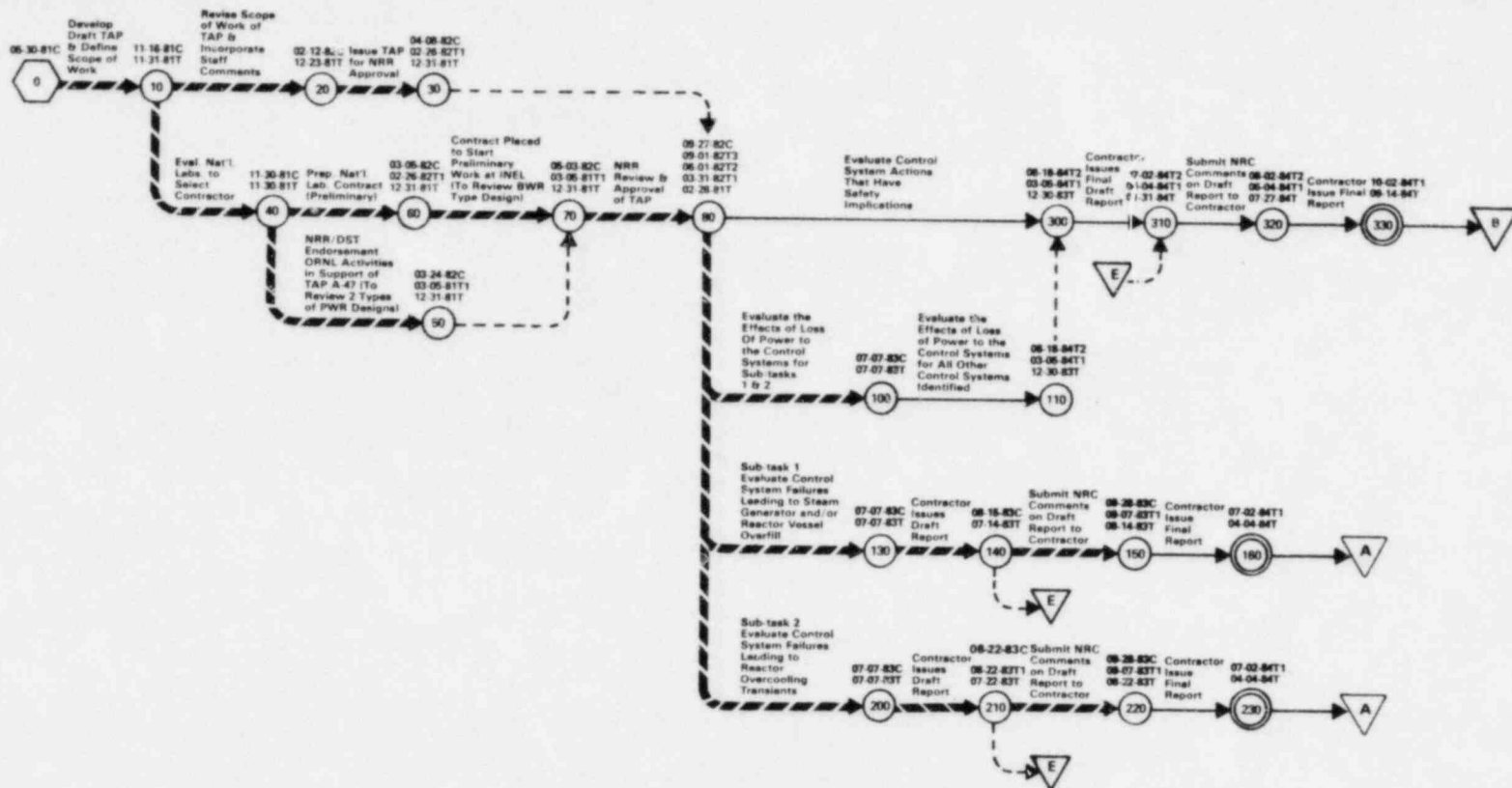




NOTE: This schedule is contingent on the availability of the BQ&E simulator for ORNL use, per agreement between RES and BQ&E. Simulator studies are to begin in October 1984.

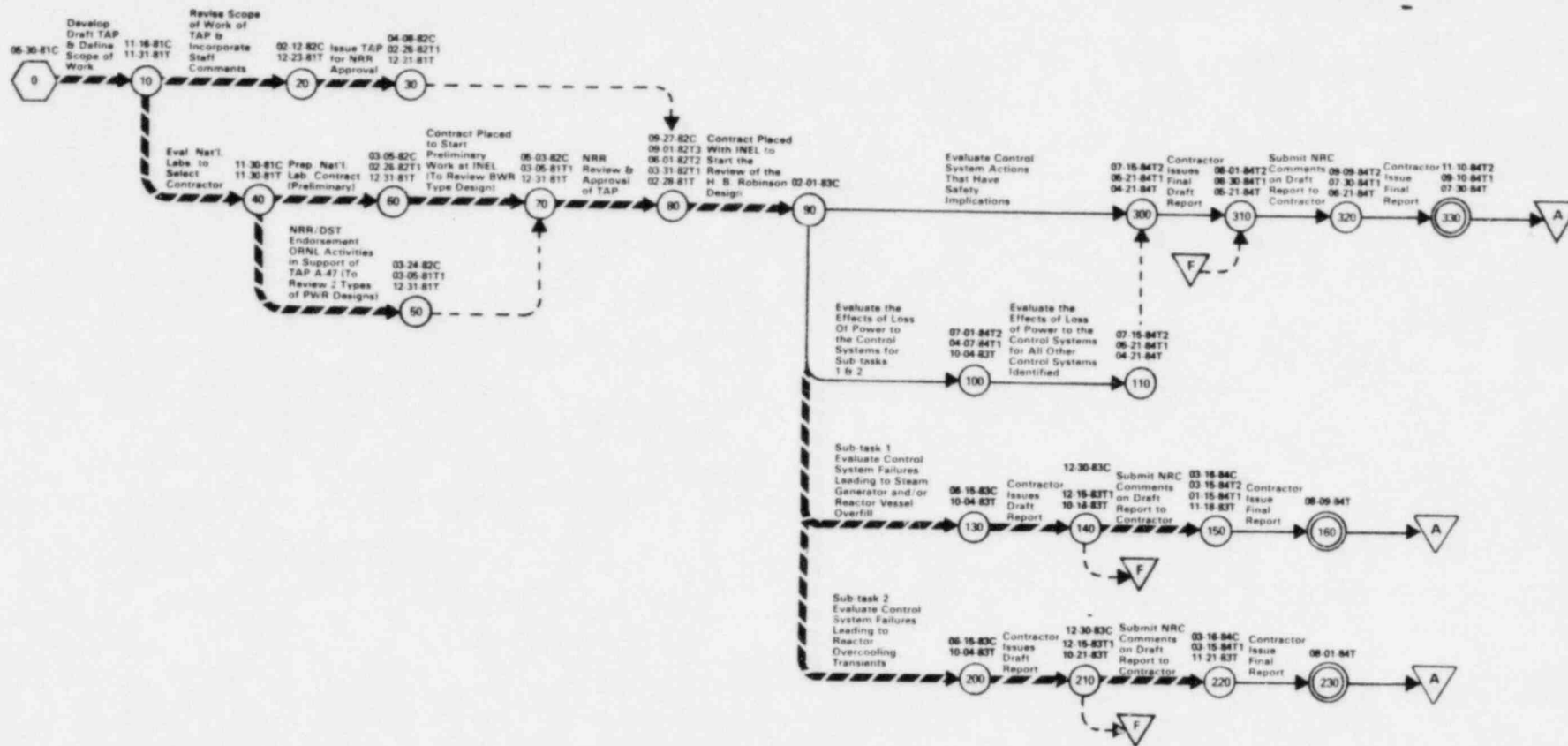
**GE-BWR
PLANT REVIEW
(BROWNS FERRY)**

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



WESTINGHOUSE-PWR PLANT REVIEW

SAFETY IMPLICATIONS OF CONTROL SYSTEMS (A-47) CONTINUED



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

AS OF WEEK ENDING

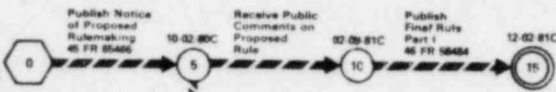
MAY 18, 1984

KEY PERSONNEL		TASK REVIEWERS		KRYSTOF PARCZEWSKI		CEB/DE/NRR		SCHEDULED COMPLETION	
TASK MANAGER		NAME	BRANCH	RICHARD CLEVELAND		RSCB/DST/NRR		ORIGINAL	06-30-85
TSUNG MING SU X27477		# GERALD MAZETIS	PSRB/DHFS/NRR	VERNON ROONEY		DL/NRR		CURRENT	# 06-30-86
NRR ANALYST		CHARLES TINKLER	CSB/DSI/NRR	JOHN LARKINS		SAB/DAT/RES			
JUDY BUTTS X24822		# JAMES CARTER	RSB/DSI/NRR	MARTEN FLEISMAN		RAB/DRA/RES			
		HUKAM GARG	EQB/DE/NRR	HAROLD POLK		SGEB/DE/NRR			
<p>• PROBLEM DESCRIPTION</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>	<p>• RES INTERFACE INFORMATION</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>• TECHNICAL ASSISTANCE CONTRACTS TO BE DEVELOPED</p>	<p>• POTENTIAL PROBLEMS</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>• ACRS INTERFACE INFORMATION</p> <p>TO BE DEVELOPED</p>	<p>FIN NO. CONTRACTOR OBLIGATED EXPENDED</p>	<p>• STATUS SUMMARY</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>			

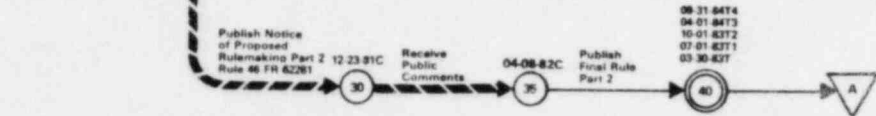
HYDROGEN CONTROL MEASURES & EFFECTS OF HYDROGEN BURNS ON SAFETY EQUIPMENT (A-48)

TASK 1 - NEAR TERM HYDROGEN RULEMAKING

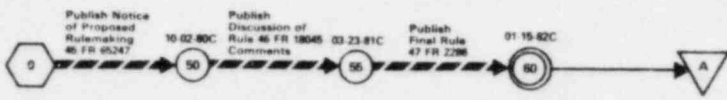
1.1 INTERIM RULE PART 1 - INERTING OF MARK I & II CONTAINMENTS



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

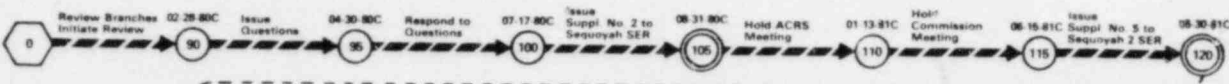


1.3 RULE FOR NEAR TERM CONSTRUCTION PERMITS & MANUFACTURING LICENSE APPLICATIONS

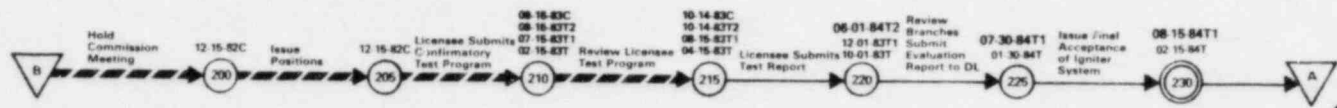
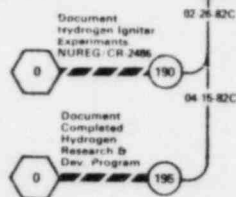
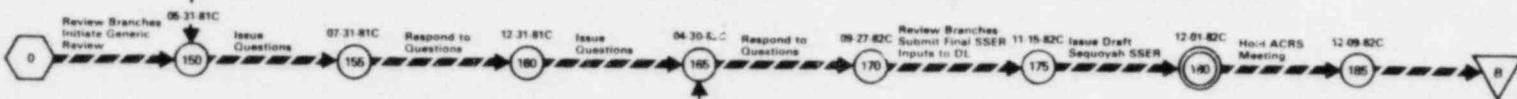


TASK 2 - PLANT SPECIFIC HYDROGEN REVIEWS

2.1 SEQUOYAH ICE CONDENSER REVIEW
2.1.1 INTERIM IGNITION SYSTEM

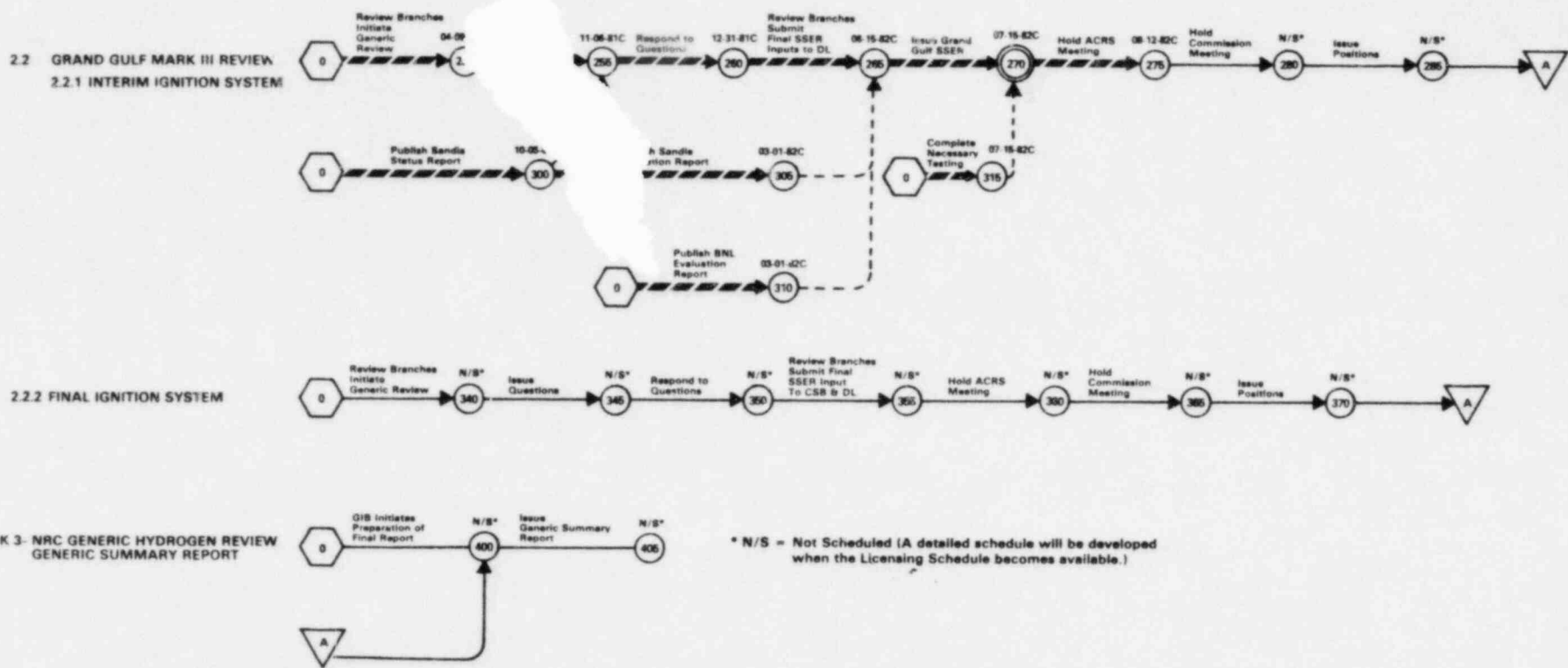


2.1.2 FINAL IGNITION SYSTEM



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

CONTINUED



PRESSURIZED THERMAL SHOCK (A-49)

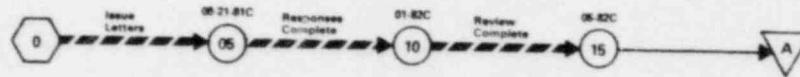
AS OF WEEK ENDING

MAY 18, 1984

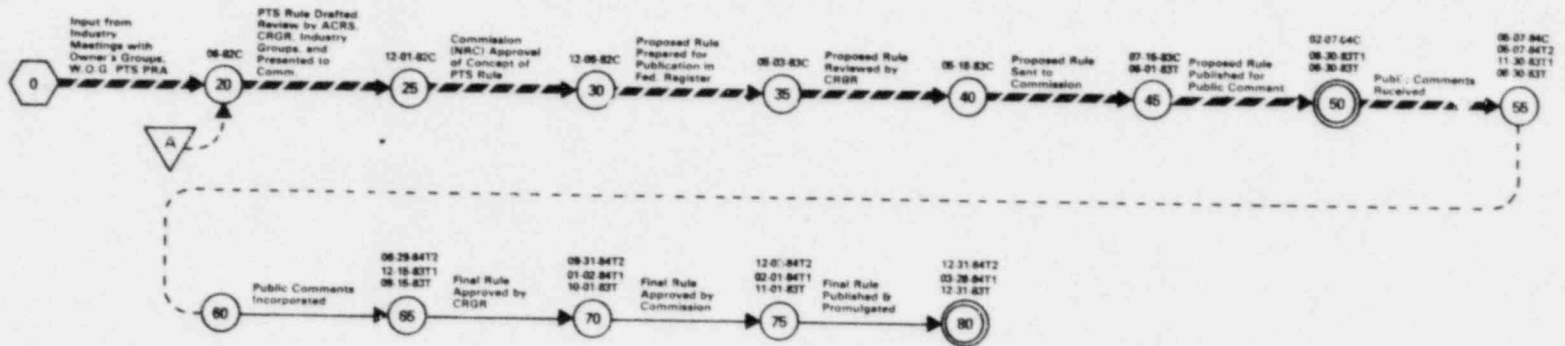
KEY PERSONNEL		TASK REVIEWERS		AS OF WEEK ENDING		SCHEDULED COMPLETION																																																									
TASK MANAGER		NAME	BRANCH			ORIGINAL	Not Determined																																																								
ROY WOODS X24714		E. THROM	RSB/NRR	R. JOHNSON	GIB/DST																																																										
<i>Roy Woods</i>		C. JOHNSON	RES	R. KLECKER	MTEB/DE																																																										
NRR ANALYST		L. LOIS	CPB/DSI	N. RANDALL	MTEB/DE																																																										
JUDY BUTTS X24822		J. STROSNIDER	RES	G. VISSING	ORB/4/DL																																																										
		M. V. GINS	RES	J. CLIFFORD	PTRB/HFS		# 03-31-86																																																								
				# S. ISRAEL	RRAB/DST																																																										
• PROBLEM DESCRIPTION		• RES INTERFACE INFORMATION		• TECHNICAL ASSISTANCE CONTRACTS		• POTENTIAL PROBLEMS																																																									
<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>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 # 80480).</p> <p>Other major contributors are:</p> <ul style="list-style-type: none"> Primary System Integrity Research Program through the Division of Engineering Technology, RES and Code Applications Program through the Division of Accident Evaluation, RES 	<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>PNL</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-0488</td><td>ORNL</td><td>Integrated PTS Study</td></tr> <tr><td>B-0119</td><td>ORNL</td><td>HSST Experiments</td></tr> <tr><td>B-8000</td><td>ENSA</td><td>Struct. Integrity</td></tr> <tr><td>B-5290</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-8942</td><td>Gundramming</td><td></td></tr> <tr><td>B-2853</td><td>PNL</td><td>Visa Development</td></tr> <tr><td>B-6980</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>NPS</td><td>Dosimetry</td></tr> <tr><td>B-2289</td><td>PNL</td><td>NDE</td></tr> <tr><td>B-2467</td><td>PNL</td><td>NDE</td></tr> <tr><td>B-2088</td><td>PNL</td><td>Accountic</td></tr> </tbody> </table>	FIN NO.	LAB	DESCRIPTION	G-1047	Purdue	Mixing Calculations	A-4070	Creare	Mixing Experiments	A-3266	PNL	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-0488	ORNL	Integrated PTS Study	B-0119	ORNL	HSST Experiments	B-8000	ENSA	Struct. Integrity	B-5290	NSRDC	Spectrum Shape	B-7026	USNA	Rapid J-R Curve	B-8942	Gundramming		B-2853	PNL	Visa Development	B-6980	HEDL	Dosimetry	B-0415	ORNL	P. V. Simulation	B-6224	NPS	Dosimetry	B-2289	PNL	NDE	B-2467	PNL	NDE	B-2088	PNL	Accountic	<p>• STATUS SUMMARY</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. 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 to be Required by the new 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	PNL	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-0488	ORNL	Integrated PTS Study																																																													
B-0119	ORNL	HSST Experiments																																																													
B-8000	ENSA	Struct. Integrity																																																													
B-5290	NSRDC	Spectrum Shape																																																													
B-7026	USNA	Rapid J-R Curve																																																													
B-8942	Gundramming																																																														
B-2853	PNL	Visa Development																																																													
B-6980	HEDL	Dosimetry																																																													
B-0415	ORNL	P. V. Simulation																																																													
B-6224	NPS	Dosimetry																																																													
B-2289	PNL	NDE																																																													
B-2467	PNL	NDE																																																													
B-2088	PNL	Accountic																																																													
	<p>• ACRS INTERFACE INFORMATION</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>	<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>6801K</td> <td>6471K</td> </tr> <tr> <td>A-7272</td> <td>LANL</td> <td>6680K FY83</td> <td>9400K</td> </tr> <tr> <td>A-3701</td> <td>BNL</td> <td>6200K</td> <td>6200K</td> </tr> </tbody> </table>	FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED	B-2510	PNL	6801K	6471K	A-7272	LANL	6680K FY83	9400K	A-3701	BNL	6200K	6200K																																													
FIN NO.	CONTRACTOR	OBLIGATED	EXPENDED																																																												
B-2510	PNL	6801K	6471K																																																												
A-7272	LANL	6680K FY83	9400K																																																												
A-3701	BNL	6200K	6200K																																																												

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

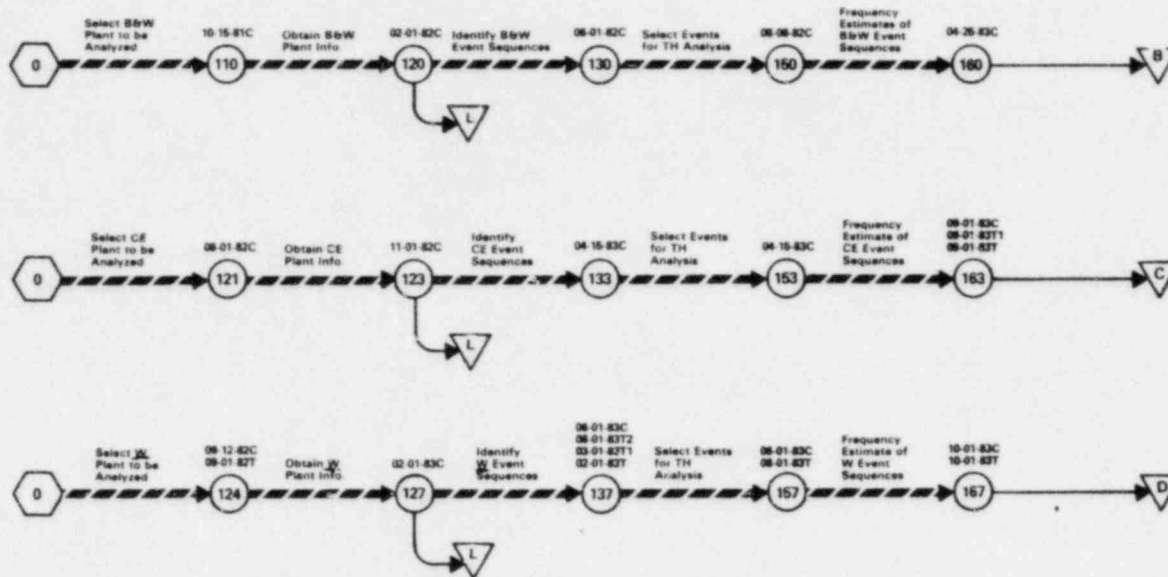
Draft revision of the trend curves in Reg. Guide 1.99, Revision 1, "Effects of Residual Elements on Predicted Radiation Damage to Reactor Vessel Materials": This task is no longer considered to be necessary for completion of A-49. Its scheduled completion is a longer term item than A-49, and adequate 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



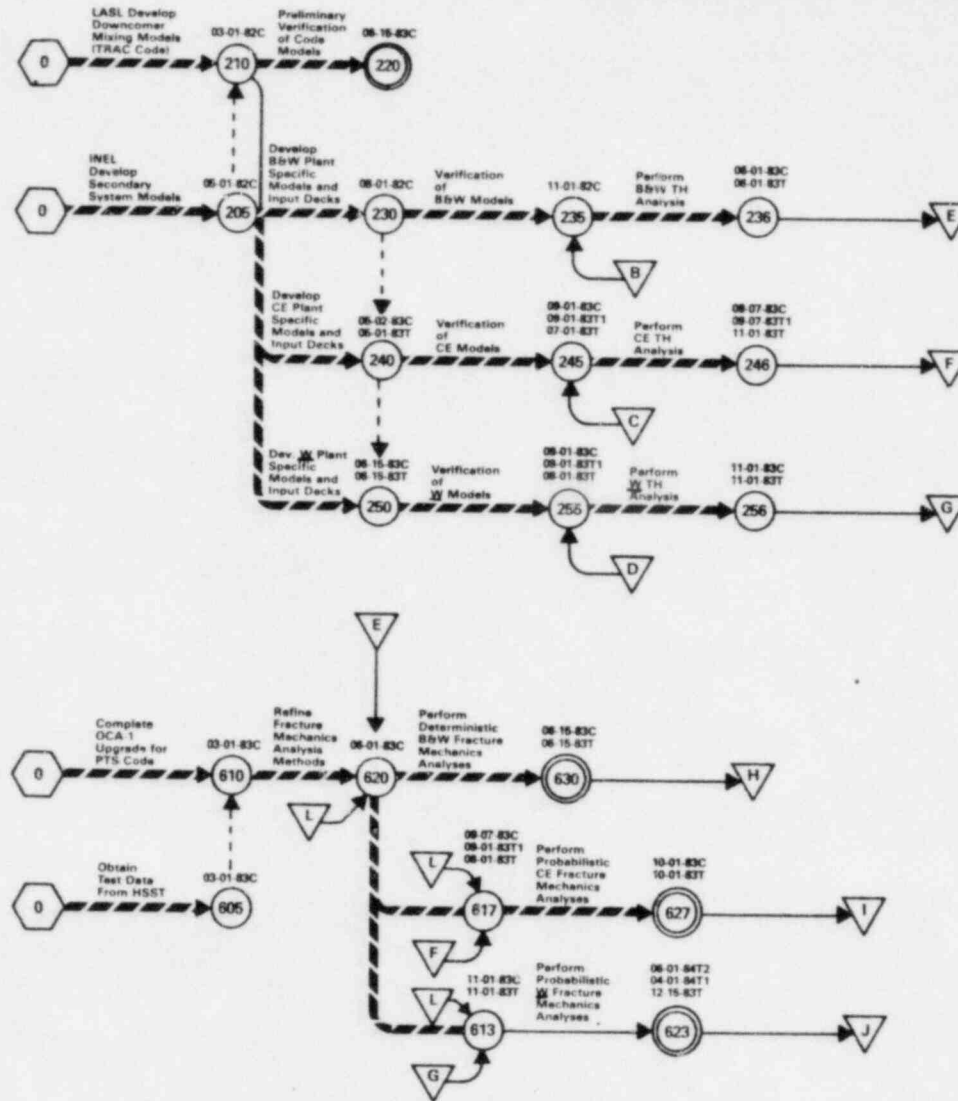
PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM (CONTINUED)

Task 4:
Transient Model Development
& Verification

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

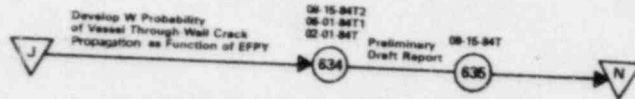
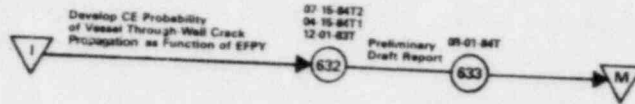
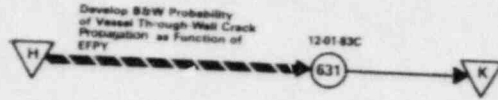
Task 6:
Improvements in Methods
and Data for Fracture
Mechanics and Calculations

Task 7:
Vessel Failure Analysis

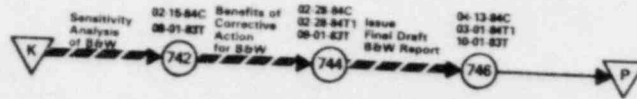


PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM (CONTINUED)

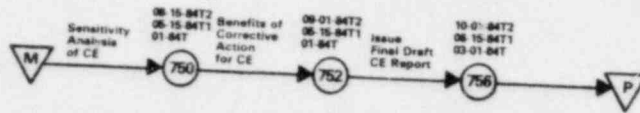
Task 8:
Integration of Results



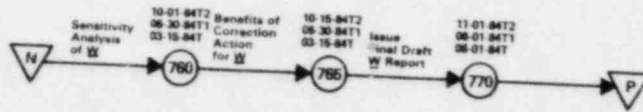
Task 9:
Plant-Specific Sensitivity Studies, Benefits of Corrective Actions, and Draft Final Report for B&W Plant



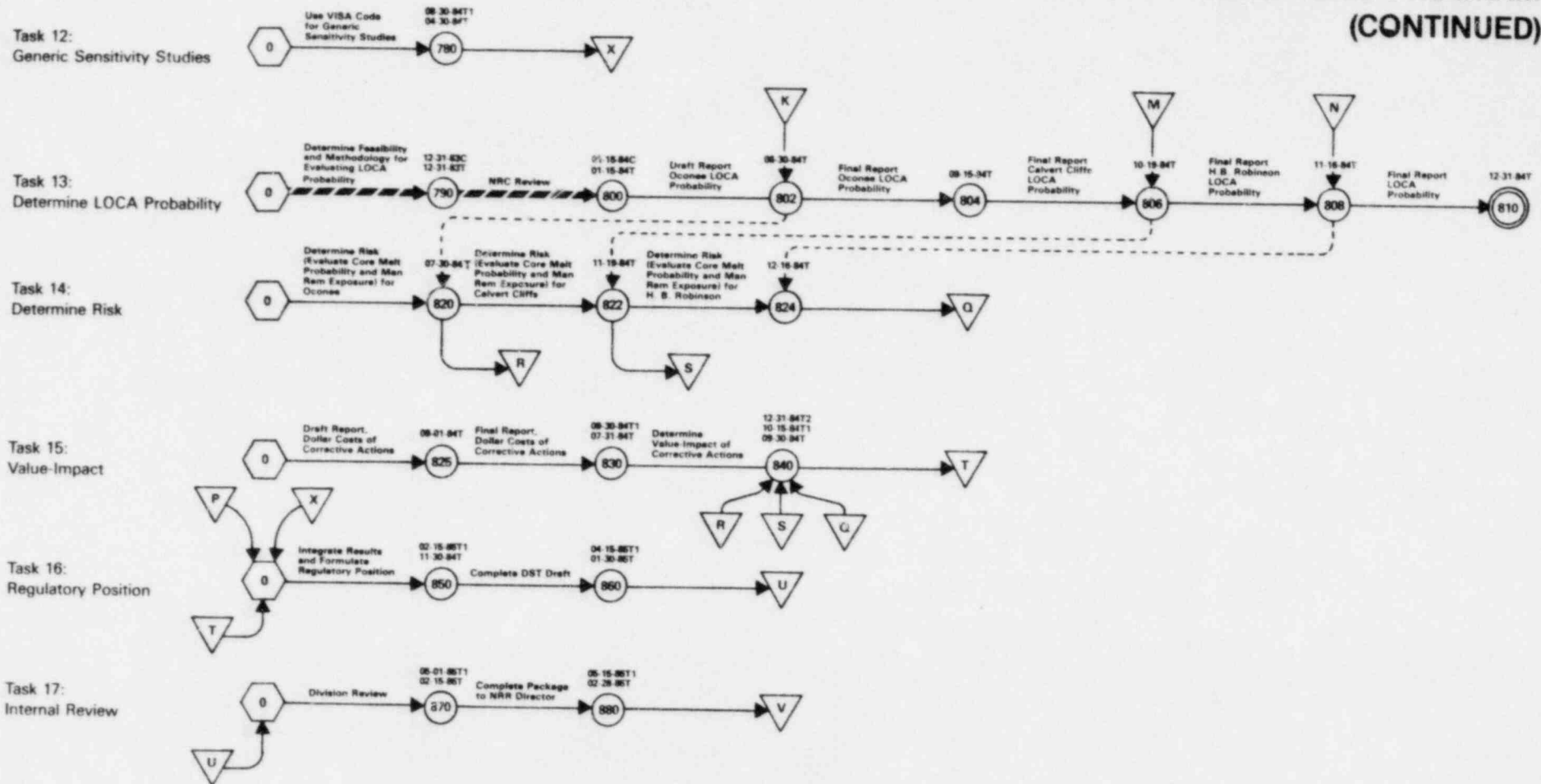
Task 10:
Plant-Specific Sensitivity Studies, Benefits of Corrective Actions, and Draft Final Report for CE Plant



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

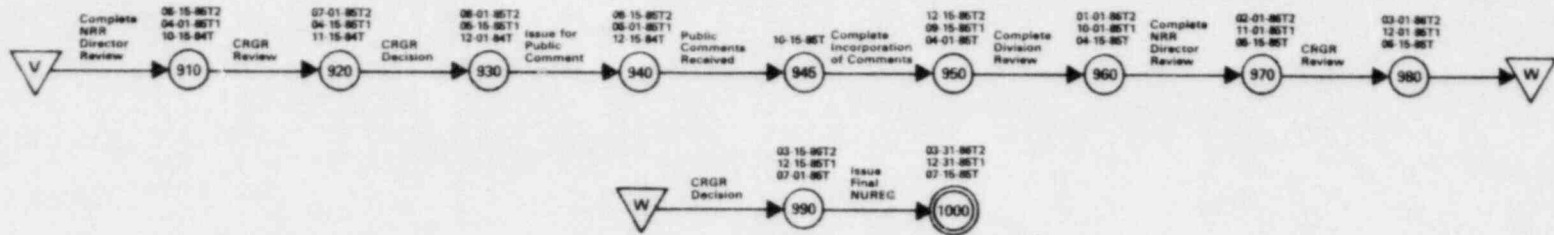


PRESSURIZED THERMAL SHOCK (A-49) LONG TERM PROGRAM (CONTINUED)



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

Task 18:
Issue Final
Technical Resolution



NRC FORM 335 <small>(7-77)</small>		U.S. NUCLEAR REGULATORY COMMISSION BIBLIOGRAPHIC DATA SHEET		1. REPORT NUMBER (Assigned by DDC) NUREG-0606, Vol. 6, No. 2
4. TITLE AND SUBTITLE (Add Volume No., if appropriate) Unresolved Safety Issues Summary (Aqua Book)		2. (Leave blank)		
7. AUTHOR(S)		3. RECIPIENT'S ACCESSION NO.		
9. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code) U. S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Division of Safety Technology Washington, D. C. 20555		5. DATE REPORT COMPLETED MONTH: May YEAR: 1984		
12. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (Include Zip Code) U. S. Nuclear Regulatory Commission Office of Nuclear Reactor Regulation Division of Safety Technology Washington, D. C. 20555		6. DATE REPORT ISSUED MONTH: May YEAR: 1984		
13. TYPE OF REPORT		8. (Leave blank)		
15. SUPPLEMENTARY NOTES		10. PROJECT TASK WORK UNIT NO.		
16. ABSTRACT (200 words or less) 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.		11. CONTRACT NO.		
17. KEY WORDS AND DOCUMENT ANALYSIS		14. (Leave blank)		
17a. IDENTIFIERS OPEN ENDED TERMS		14. (Leave blank)		
18. AVAILABILITY STATEMENT Unlimited		19. SECURITY CLASS (This report) Unclassified		21. NO. OF PAGES
		20. SECURITY CLASS (This page) Unclassified		22. PRICE