

RES RESPONSE

DEVELOPED PROPOSED TEST MATRIX

- PRIMARY EMPHASIS ON LOCA AND TRANSIENT CODE IMPROVEMENTS AND ASSESSMENT
- FULL ADVANTAGE OF LOFT FACILITY LARGE SCALE AND NUCLEAR CORE
- ADDRESS NRC ISSUES

ESTIMATED DATE OF FINAL TEST JANUARY 1983

POSSIBLE ADDITION SEVERE CORE DAMAGE EXPERIMENT

CONCLUSIONS

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RES PROPOSED LOFT TEST MATRIX

TEST MATRIX CONSISTENT WITH LOFT SPECIAL REVIEW GROUP DESCRIPTION

CONSISTENT WITH LOFT SPECIAL REVIEW GROUP HIGH PRIORITY EXPERIMENTS  
WITH ONE EXCEPTION

INCLUDES CONTINGENCY EXPERIMENTS

BUDGET IMPLICATIONS WILL BE DISCUSSED ON FEBRUARY 13, 1983

# RESEARCH PROPOSAL FOR LOFT TEST PROGRAM

<u>TEST DESCRIPTION</u>	<u>LSRG</u>	
	<u>PRIORITY</u>	<u>NOMENCLATURE</u>
L-OF-FW, SG DRYOUT, LOCK OPEN PORV, SG REFILL	M/H	L9-1/L3-3
COOLDOWN ACCIDENTS ST. LUCIE, AND	H	L6-7/L9-2
INTERMED. BREAK; ACCUM. LINE, UNCOVERY	H	L5-1/L8-2
OPERATIONAL TRANS CONTINGENCY*	M	LA-10
LB LOCA; PRES <sup>D</sup> , FUEL; L.-OF-OFFSITE; OFFNORM. ICs	H	LA-1/L2-5
INTERMED. BREAK CONTINGENCY*	H	LA-2
ATWS w/L OF FW	H	L9-3
S.B. AFTER CODE ASSMENT PROGRESS CONTINGENCY*	M	LA-3
ATWS CONTINGENCY*	H	LA-3
LB LOCA, PRES <sup>D</sup> , FUEL, L-OF-OFFSITE, DELAY ECC	H	L2-6
<hr/> NO TESTS BELOW <hr/>		
LB LOCA, UPPER PLENUM INJ.	H	L4-2
S.B. CONFIRM PUMPS ON/OFF RESULTS	M	LA-5
LB LOCA REPEAT	M	LA-4
ANTIC, TRANS ROD w/d	L	L6-4
ATWS, L OF OFFSITE	L	L9-4
ANTIC, TRANS; UNCONT, B. DILUTION	L	LA-6/L6-6
STEAM LINE BREAK	L	LA-7
STEAM LINE BREAK	L	LA-8

NOTE: THE ESTIMATED DATE OF COMPLETION OF ALL TESTS WILL BE APRIL 84

\*PREPLANNED TESTS TO BE RUN ONLY IF REQUIRED. OF THE 4 TESTS,  
RES ESTIMATES 2 WILL BE NECESSARY.

# RESEARCH PROPOSAL FOR LOFT TEST MATRIX

DESCRIPTION	LSRG	DCC RULEMAKING NEED	APP <sup>X</sup> K NEED	TEST DATE (RES ESTIMATE)
L-OF-FW, SG DRYOUT, LOCK OPEN PORV, SG REFILL	M/H	X		4/81
COOLDOWN ACCIDENTS ST. LUCIE, AND	H	X		8/81
INTERMED. BREAK; ACCUM. LINE, UNCOVERY	H	X	X	10/81
OPERATIONAL TRANS <u>CONTINGENCY*</u>	M			12/81
LB LOCA PRES <sup>D</sup> , FUEL; L-OF-OFFSITE: OFFNORM, ICs	H**	X	X	4/82
INTERMED. BREAK <u>CONTINGENCY*</u>	H	X		6/82
ATWS w/L OF FW	H	X		9/82
S.B. AFTER CODE ASSMENT PROGRESS <u>CONTINGENCY*</u>	M	X		12/82
ATWS <u>CONTINGENCY*</u>	H	X		3/83
LB LOCA, PRES <sup>D</sup> , FUEL, L-OF-OFFSITE, DELAY ECC	H***	X	X	6/83

CONTINGENCY\* = PREPLANNED TESTS TO BE RUN ONLY IF REQUIRED,  
OF THE 4 TESTS, RES ESTIMATES 2 WILL BE NECESSARY, IN WHICH  
CASE, FINAL TEST WILL TAKE PLACE IN JANUARY 1983.

\*\*CLAD BURST POSSIBLE

\*\*\*CLAD BURST LIKELY

BURNUP LIMITED TO 2 WEEKS  
IN BOTH CASES.

## BENEFITS OF PROPOSED TEST MATRIX

• • ADDRESSES HIGHEST PRIORITY CONCERNS, INCLUDING LSRG

FIXED PROGRAM MEANS -

PREDICTABLE COMPLETION DATE

ORDERLY SHUTDOWN

GREATER EFFICIENCY

LOWER COSTS

OPPORTUNITY FOR INPUT FROM DCC RULEMAKING BEFORE SHUTDOWN

LEAVE POSSIBILITY OF PREPLANNED CONTINGENCY TESTS

SHOULD LEAVE ONE USEABLE CORE AVAILABLE IN CASE OF REACTIVATION

LOW PROBABILITY OF FACILITY CONTAMINATION

## POTENTIAL PROBLEM AREAS

UNEXPECTED FUEL FAILURES - INSUFFICIENT FUEL

POSSIBLE DECONTAMINATION PROBLEMS FOLLOWING FUEL FAILURE

INEL HAS NOT REVIEWED OR COMMITTED TO BUDGET AND SCHEDULES

PROGRAM AND FUNDING PLANS MUST BE MADE FOR SECONDARY TASKS

- INSTRUMENTATION
- MAN-MACHINE INTERFACE
- ELECTRICAL - NUCLEAR HEATER COMPARISON
- ANALYSIS OF INADVERTANT POWER REACTOR TRANSIENTS

UNCERTAINTY IN DECONTAMINATION AND DECOMMISSIONING



## POSSIBLE SEVERE CORE DAMAGE EXPERIMENT, L8-4

A MULTIFAILURE TRANSIENT, TO BE DETERMINED, WILL LEAD TO CORE UNCOVERY. FUEL FAILURES WILL BE ALLOWED TO PROGRESS TO SOME POINT TO BE DEFINED IN SUPPORT OF THE DCC RULEMAKING.

### GOALS

PROGRESS OF FUEL DAMAGE THROUGH CORE

FISSION PRODUCT AND FUEL FRAGMENT TRANSPORT THROUGH SYSTEM

QUESTIONS ARISING FROM THE DCC RULEMAKING ON FUEL DAMAGE  
IN A LARGE CORE

POSSIBLE SEVERE CORE DAMAGE EXPERIMENT

SUPPORT OF DCC RULEMAKING

LONG-TERM CORE UNCOVERY EFFECT ON CORE DAMAGE

FUEL MELT EXPECTED TO OCCUR

FACILITY CONTAMINATION EXPECTED

INCREASED COST OF DECONTAMINATION AND DECOMMISSIONING

RES DOES NOT RECOMMEND TEST



CONSULTANT AND INDUSTRY COMMENTS

CREARE

...A MAJOR FORCE IN RELATING SEPARATE EFFECTS STUDIES TO REALITY ...  
OUR FINAL DEMONSTRATION [P. ROTHE]

P. GRIFFITH

...RESULTS SHOW APPENDIX K NEEDS TO BE REWRITTEN

S. BANERJEE

...NEEDED FOR LARGE AND INTERMEDIATE BREAK STUDIES, CORE UNCOVERY AND  
FISSION PRODUCT DISPERSAL.

R. LAHEY

...UNIQUE FOR LARGE BREAK LOCA, SEVERE CORE DAMAGE STUDIES

EPRI

...NEEDED FOR STEAM LINE BREAK, ATWS, OVER PRESSURE CHALLENGE TESTS  
[T. FERNANDEZ]

CONSULTANT AND INDUSTRY COMMENTS (CONT'D)

WESTINGHOUSE

...RESULTS USED TO JUSTIFY AN EM DEVELOPMENT ACTIVITY ... ASYMMETRIC  
DOWNCOMER BEHAVIOR [V. ESPOSITO]

...VIEWS LOFT AS PROGRAM WHICH WILL PROVIDE MORE INFORMATION ON COMPLEX  
T-H INTERACTION IN LOCA AND NON-LOCA EVENTS

...MEANS TO ASSIST, DEVELOP, AND UNDERSTAND COMPUTER MODELS.

EXXON

...INTERESTED IN LOFT RESULTS ON FUEL BEHAVIOR AND MODEL VERIFICATION  
[E. JENSEN]

## USEFULLNESS OF LOFT ABROAD (FROM RECENT PRESENTATIONS)

### JAPAN

JAERI HAS OWN LOFT COMMITTEE TO ENSURE APPLICATION OF DATA TO CODE ASSESSMENTS [K. TASAKA]

### NETHERLANDS

DIRECTLY TRANSFER LOFT DATA VIA CODES TO COMMERCIAL PLANT DESIGN, OPERATION, AND LICENSING  
[B. WINTERS]

### GERMANY

LOFT IS THE FACILITY WHICH AT THIS MOMENT IS CLOSEST TO REALITY

SIGNIFICANT INFLUENCE ON ASSESSMENT AND DEVELOPMENT OF LARGE AND SMALL BREAK CODES AT  
GRS [E. HICKEN]

THE FINAL STEP IN CODE VERIFICATION [E. HICKEN]

IMPORTANT BENEFITS INCLUDE INSTRUMENTATION, MAN-MACHINE INTERFACE DEVELOPMENTS AND  
CORE DAMAGE RESULTS. [E. HICKEN]

CSNI SELECTED 1/3 OF INTERNATIONAL STD. PROBLEMS FROM LOFT TESTS.

HALDEN (CONSIDERED WORLD CENTER FOR ADVANCEMENTS IN MAN-MACHINE INTERFACE) LOFT HAS  
INTERDISCIPLINARY PROFESSIONS WHICH ARE ABSOLUTE PREREQUISITE TO FINDING SOLUTIONS TO  
OPERATOR-PROCESS COMMUNICATION PROBLEMS. LOFT OFFERS POTENTIAL FOR DEVELOPMENT OF METHODS  
FOR REAL TIME DISTURBANCE AND ACCIDENT ANALYSES IN A REALISTIC ENVIRONMENT WHICH YOU FIND