Docket Nos. 50-335
and 50-389

January 11, 1989

LICENSEE: Florida Power and Light Company

FACILITY: St. Lucie Units 1 and 2

SUBJECT: SUMMARY OF MEETING HELD ON JANUARY 9, 1989

A meeting was held at the NRC offices in Rockville, Maryland on January 9, 1989, to discuss RETRAN code applications for the St. Lucie Plant. The licensee outlined the general approach and scope of the effort, then discussed schedules of submittals and plans for the future.

The detailed agenda and attendance list are enclosed.

ORIGINAL SIGNED BY

Jan A. Norris, Senior Project Manager
Project Directorate II-2
Division of Reactor Projects-I/II
Office of Nuclear Reactor Regulation

Enclosures:
As stated

DISTRIBUTION

Docket File		ACRS(10)
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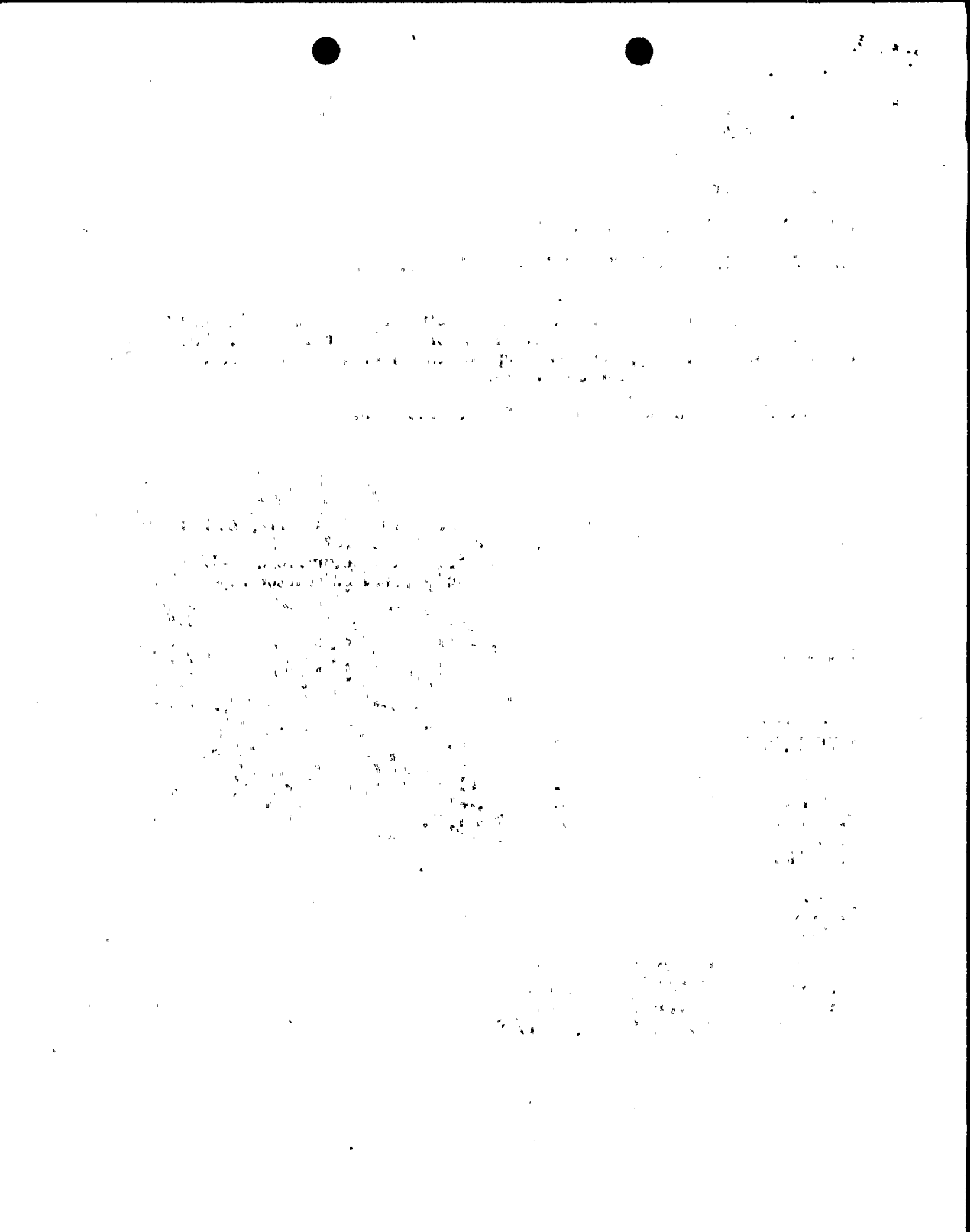
D. Miller		
J. Norris		
OGC-WF		
E. Jordan	15/B/18	
B. Grimes	MNBB 3302	

[ST. LUCIE MTG SUMMARY]

LA:PDII-2	PM:PDII-2	D:PDII-2
DMiller	JNorris:jd	HBerkow
01/11/89	01/11/89	01/11/89

BCB for

MEMO DFOl



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St. Lucie Plant

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ENCLOSURE 1

ST. LUCIE MEETING WITH NRC

CONCERNING RETRAN APPLICATIONS

January 9, 1989

NAME	AFFILIATION
J. Norris	NRC:NRR:PM
G. Arpa	FPL
J. Ramos	FPL
J. Handschuh	FPL
E. Weinkam	FPL
G. Wunder	NRC:NRR:PE
D. Katze	NRR/SRXB
R. Jones	NRR/SRXB

ENCLOSURE 2

FLORIDA POWER AND LIGHT MEETING WITH NRC

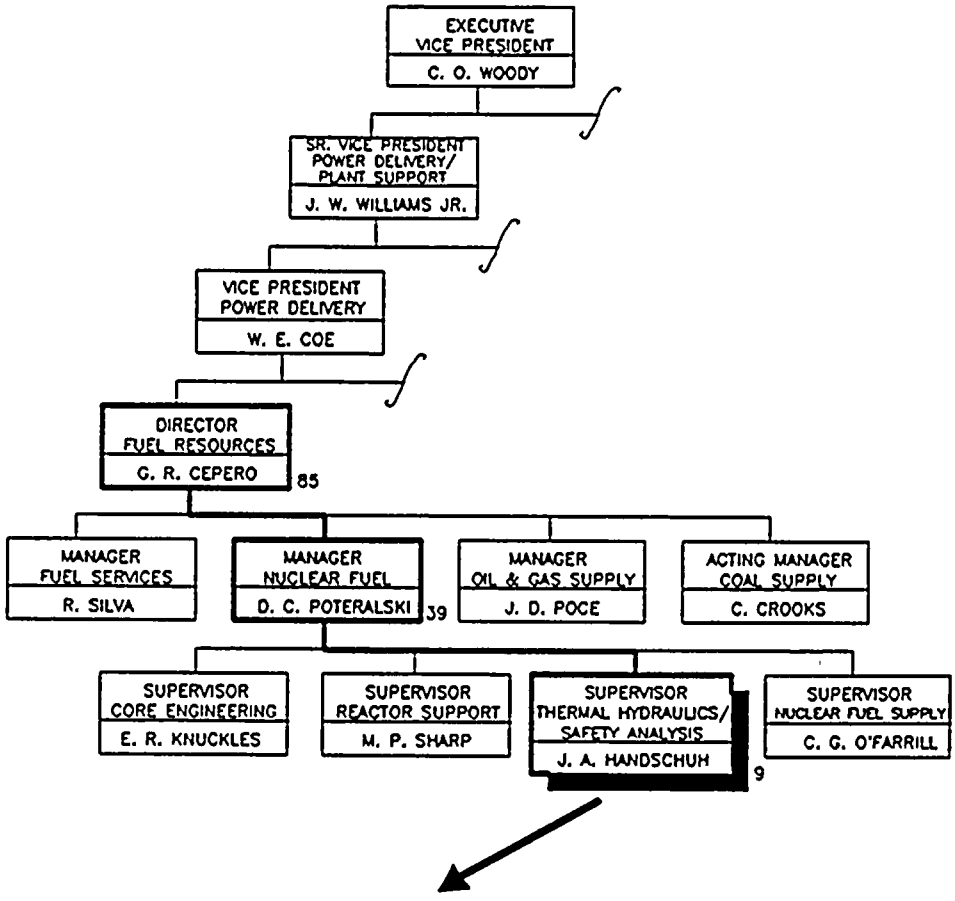
RETRAN APPLICATIONS

1.	INTRODUCTION	Joel Handschuh
2.	REVIEW OF 1985 TOPICAL REPORT	Joel Handschuh
	a. History	
	b. Calculational Comparisons	
	c. Safety Evaluation Report	
3.	LICENSING APPROVAL	Joel Handschuh
	a. Decrease in Secondary Side Heat Removal Category	
4.	ANALYTICAL BENCHMARKS	Jorge Arpa
	a. Turkey Point Loss of Inverter	
	b. St. Lucie Loss of Feedwater	
	c. St. Lucie Loss of 1 Feedpump with Turbine Runback	
	d. Licensing Methodology	
5.	FUTURE TECHNICAL SPECIFICATION CHANGES	Joel Handschuh
6.	DISCUSSION	

INTRODUCTION

- PURPOSE OF MEETING
  - FEEDBACK ON APPROACH
  - FEEDBACK ON SCOPE OF EFFORT
  - DISCUSSION OF SCHEDULES
  - DISCUSSION OF FUTURE PLANS

ORGANIZATION



THERMAL HYDRAULICS ACCOUNTABILITIES

ACCOUNTABILITY	TYPE OF ACTIVITY		QUALITY ELEMENT	CUSTOMER
	SAFETY REVIEW	ANALYTICAL SUPPORT		
PLANT SAFETY ISSUES	●	●	SAFETY	NUCLEAR ENERGY
RELOAD SAFETY EVALUATIONS	●		SAFETY	
SUPPORT FUEL DESIGN CHANGES	●	●	SAFETY / PRICE	
REACTOR TRIP EVALUATION		●	SAFETY / PRICE	
EMERGENCY DRILL SCENARIOS		●	SAFETY / PRICE	
PLANT SIMULATORS VERIFICATION		●	SAFETY / PRICE	
SAFETY ANALYSIS (FSAR) UPDATES	●		SAFETY	

FP&L TRANSIENT ANALYSIS EXPERIENCE

1977-1981	RETRAN CODE VERIFICATION, CONTRIBUTION TO RETRAN USERS MANUAL, VOLUME 4, APPLICATIONS TRANSIENTS: UNCONTROLLED ROD WITHDRAWAL, LOSS OF FLOW, RCS PUMP COASTDOWN
1977-1978	SAFETY & FUEL MANAGEMENT ANALYSIS METHODS TOPICAL REPORT BASED ON THE DYNODE AND COBRA CODES, NRC SUBMITTAL OF JULY 1978 TRANSIENTS: UNCONTROLLED ROD WITHDRAWAL, LOSS OF LOAD, CEA EJECTION LOSS OF FLOW, ROD DROP, STEAMLINE BREAK
1980-1983	NATURAL CIRCULATION COOLDOWN CURVES FOR ST. LUCIE 1, NRC SUBMITTAL OF DECEMBER 1980, NRC SER ISSUED APRIL 1983 TRANSIENTS: REACTOR COOLDOWN WITHOUT RCS PUMPS
1982-1984	ANALYSIS OF PTS OVERCOOLING TRANSIENTS TRANSIENTS: SBLOCA, STEAMLINE BREAK
1982	ST. LUCIE 1, CYCLE 6 VENDOR ANALYSIS VERIFICATION TRANSIENTS: LOSS OF LOAD, MAIN STEAMLINE BREAK, LOSS OF FLOW, TM/LP SETPOINT VERIFICATION
1983	ANALYSIS OF ST. LUCIE 1 PRESSURIZER SETPOINT TRANSIENT: LOSS OF LOAD
1984-1988	REACTOR TRIP PREVENTION/EVALUATION TRANSIENTS: FEEDWATER CONTROL, TURBINE RUNBACK, AUTOMATIC CONTROL ROD MOTION, REACTOR TRIP ON TURBINE TRIP, RPS SETPOINTS, MSIV AND STEAM DUMP EFFECTS
1986	TRANSIENTS FOR USE IN SIMULATOR VERIFICATION
1988	APPROVAL OF 1985 RETRAN TOPICAL REPORT

FLORIDA POWER AND LIGHT 1985 TOPICAL REPORT

- SUMMARY OF TRANSIENTS ANALYZED WITH RETRAN
- TOPICAL REPORT SCOPE
  - 14 BENCHMARK COMPARISONS
  - TRANSIENT FOR EACH MAJOR EVENT CATEGORY
  - INCLUDED FSAR AND PLANT COMPARISONS
- INITIALLY REQUESTED FULL LICENSING APPROVAL
- REQUEST MODIFIED IN MARCH 1986
  - LIMITED APPROVAL TO TECHNICAL COMPETENCE
- SAFETY EVALUATION RECEIVED APRIL 1988
  - FP&L FULFILLS GENERIC LETTER 83-11
  - LICENSING APPROVAL REQUIREMENTS PROVIDED

LICENSING APPROVAL FOR FP&L

- FOCUS ON ONE EVENT CATEGORY
- DECREASE IN SECONDARY SIDE HEAT REMOVAL
- CATEGORY EXAMINED IN DEPTH IN 1985 TOPICAL
  - TURKEY POINT LOSS OF ONE FEEDPUMP
  - ST. LUCIE UNIT 2 GENERATOR TRIP TEST
  - ST. LUCIE UNIT 1 MSIV CLOSURE EVENT
  - ST. LUCIE UNIT 1 CHAPTER 15 LOSS OF LOAD
- BENEFITS TO FP&L
  - BEGINS PHASED APPROACH TO LICENSING APPROVALS
  - OBTAINS APPROVAL IN IMPORTANT CATEGORY
    - COMMON SOURCE OF REACTOR TRANSIENTS
  - IMPROVES LICENSEE UNDERSTANDING
  - REDUCES ANALYSIS COSTS

ANALYTICAL BENCHMARKS

GOAL

DEVELOP A METHODOLOGY FOR THE ANALYSIS OF EVENTS INVOLVING DECREASES IN SECONDARY HEAT REMOVAL AND OBTAIN APPROVAL SO THAT FUTURE LICENSING SUBMITTALS INVOLVING THIS CATEGORY OF EVENTS CAN BE RESOLVED EXPEDITIOUSLY.

APPROACH

1. ESTABLISH CAPABILITY TO REPLICATE PLANT BEHAVIOR WITH IN-HOUSE RETRAN MODELS.

2. DEMONSTRATE UNDERSTANDING OF KEY PHYSICAL PHENOMENA AND CODE OPTIONS AND LIMITATIONS.

3. DEVELOP FPL METHODOLOGY FOR LICENSING ANALYSES OF EVENTS INVOLVING DECREASES IN SECONDARY HEAT REMOVAL.

ANALYTICAL BENCHMARKS

1. ESTABLISH CAPABILITY TO REPLICATE PLANT BEHAVIOR WITH IN-HOUSE RETRAN MODELS.

PLANT BÉNCHMARK ANALYSES:

- LOSS OF INVERTER
  - * Turbine Runback
  - * High Pressurizer Pressure Trip

- MAIN FEEDWATER VALVE ISOLATION
  - * Isolation of 1 of the 2 Reg.Valves
  - * SG Low Level Trip

- FEEDWATER PUMP ISOLATION AND RESTART
  - * Isolation of 1 of the 2 Feedw.Pumps
  - * Turbine Runback
  - * High Pressurizer Pressure Trip

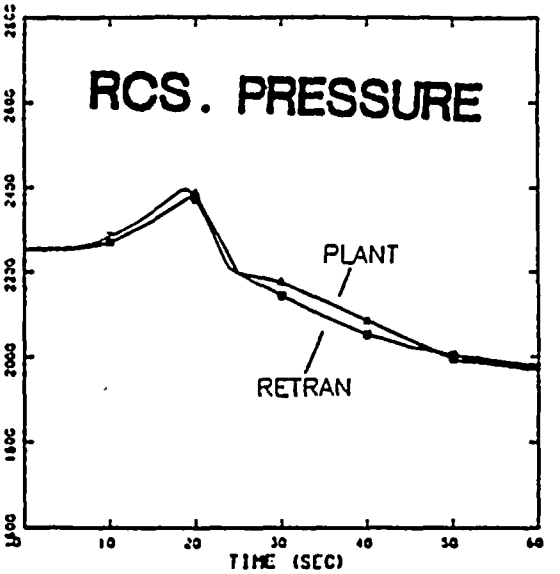
ANALYTICAL BENCHMARKS

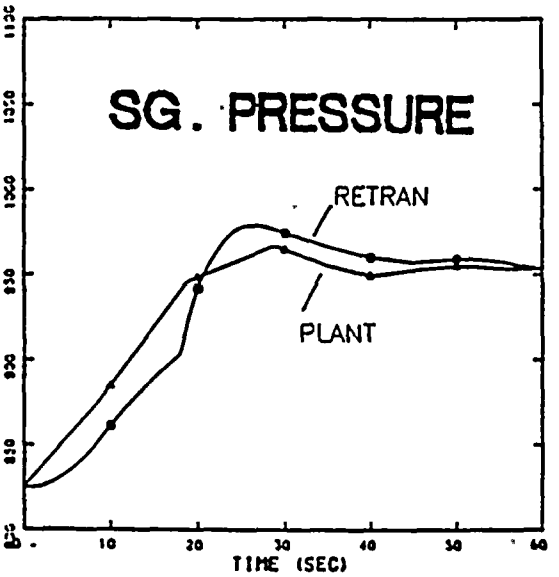
LOSS OF INVERTER

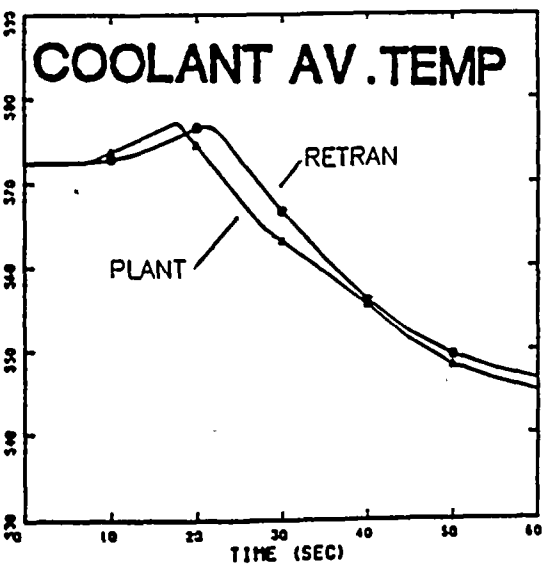
Main Initial Conditions and Assumptions

- LOSS OF INVERTER EVENT OF 6/20/85 AT TURKEY POINT 4
- FULL POWER, MOC CONDITIONS
- FEEDWATER FLOW:
  - * 1 PUMP IN MANUAL
  - * 2 PUMPS IN AUTOMATIC
- TURBINE RUNBACK TO 70% AT 200% / MINUTE
- 1 AUX. FEEDW. PUMP DELIVERING FULL FLOW FROM TIME ZERO.
- NO PRESSURIZER HEATERS
- PRESSURIZER SPRAY STUCK AT INITIAL POSITION (10%).
- PORVs NON OPERABLE
- LOAD REJECTION MODE OF OPERATION OF STEAM DUMP BYPASS SYSTEM NOT OPERABLE. ONLY AFTER REACTOR TRIP MODE OF OPERATION AVAILABLE.

LOSS OF INVERTER

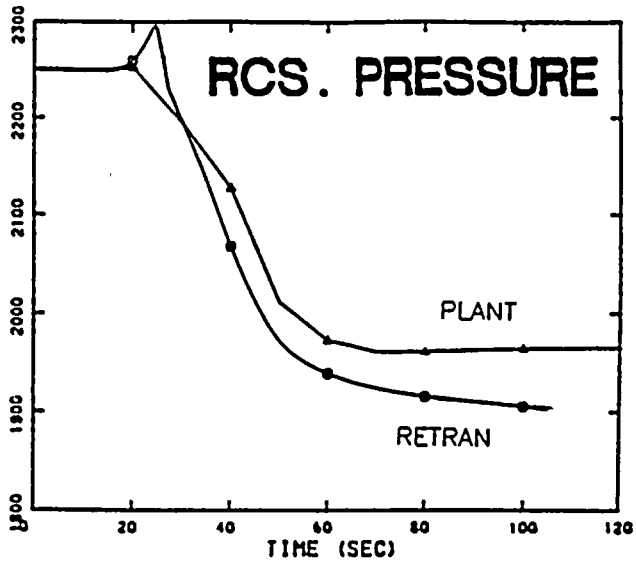


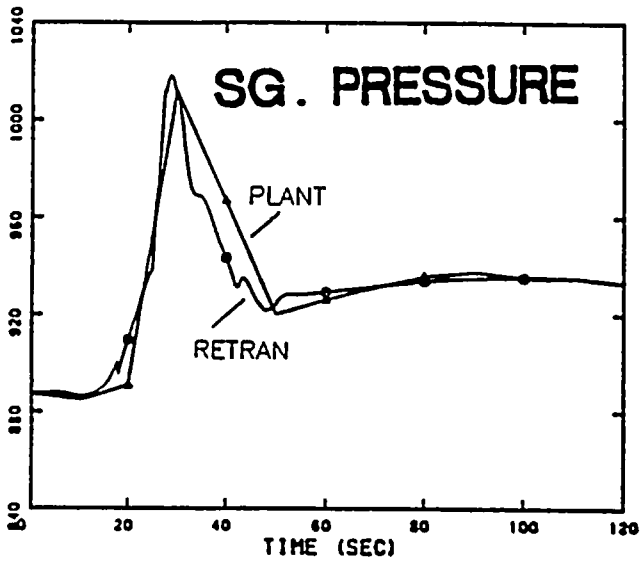


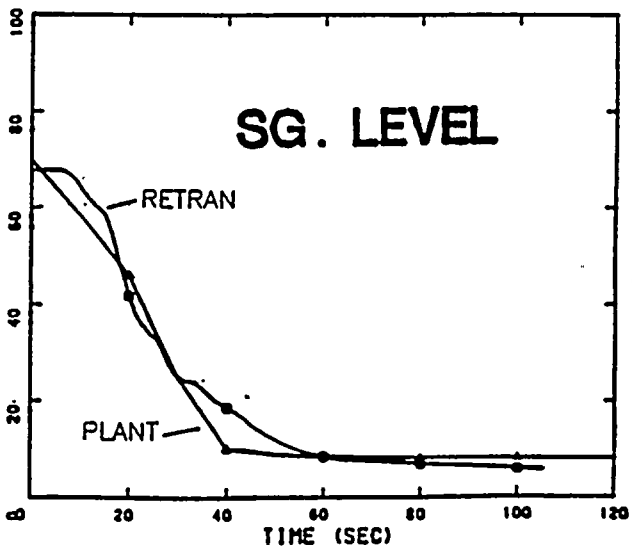


MAIN FEEDWATER VALVE ISOLATION

- EVENT OF 9/20/88 AT ST. LUCIE UNIT 1
- FULL POWER, BOC CONDITIONS







FEEDWATER PUMP ISOLATION AND RESTART

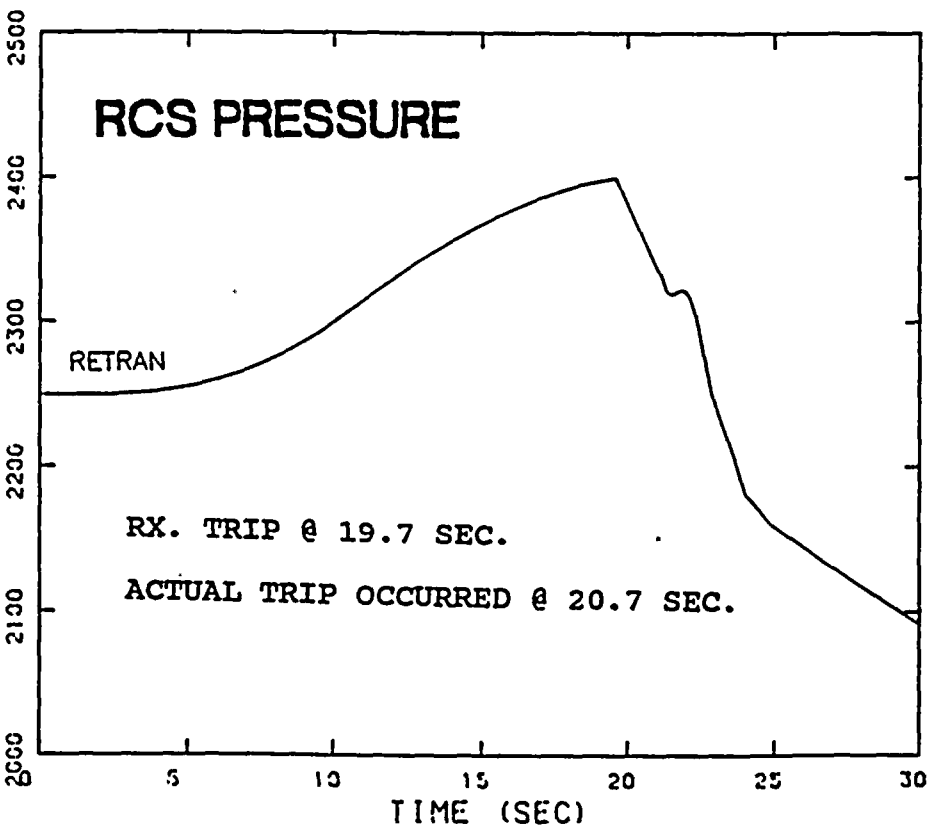
Main Initial Conditions and Assumptions

- STEAM GENERATOR B, MAIN FEEDWATER PUMP LOSS AND SUCCESSIVE RESTART (10 SEC. LATER) EVENT OF 6/14/87.

  AT ST. LUCIE UNIT 1.

- TURBINE RUNBACK TO 67% AT 200% / MINUTE

- FULL POWER, BOC CONDITIONS

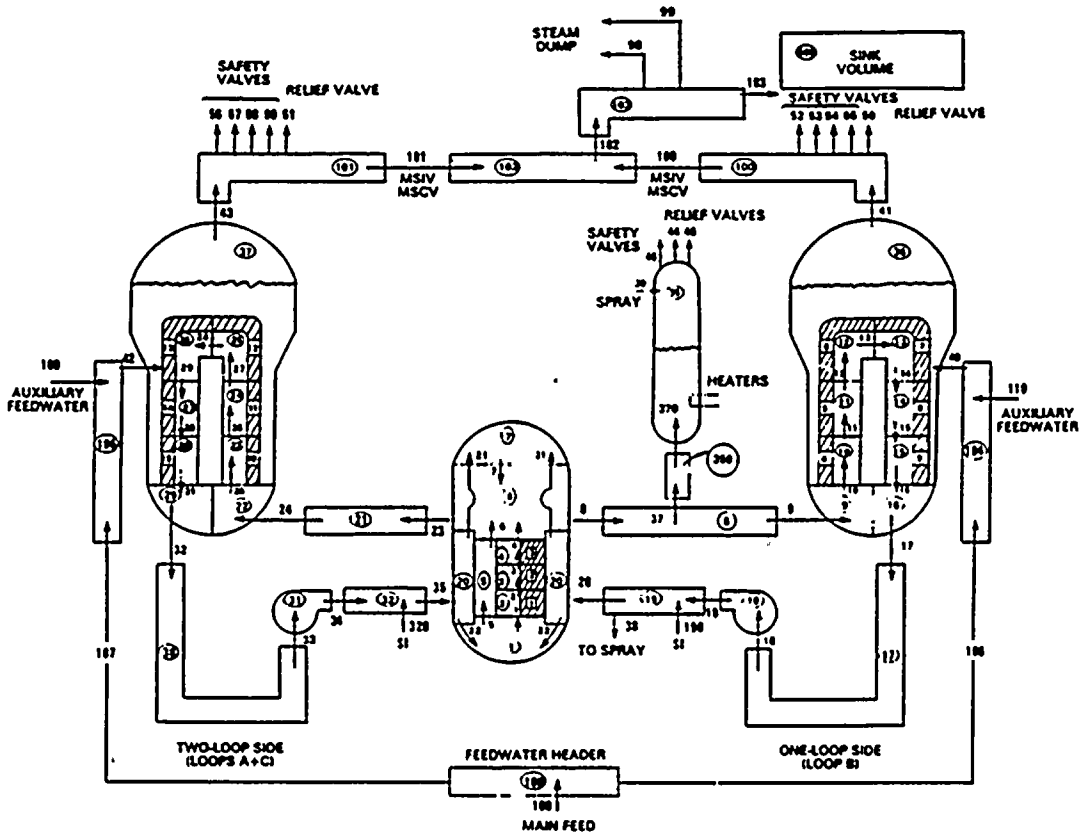


ANALYTICAL BENCHMARKS

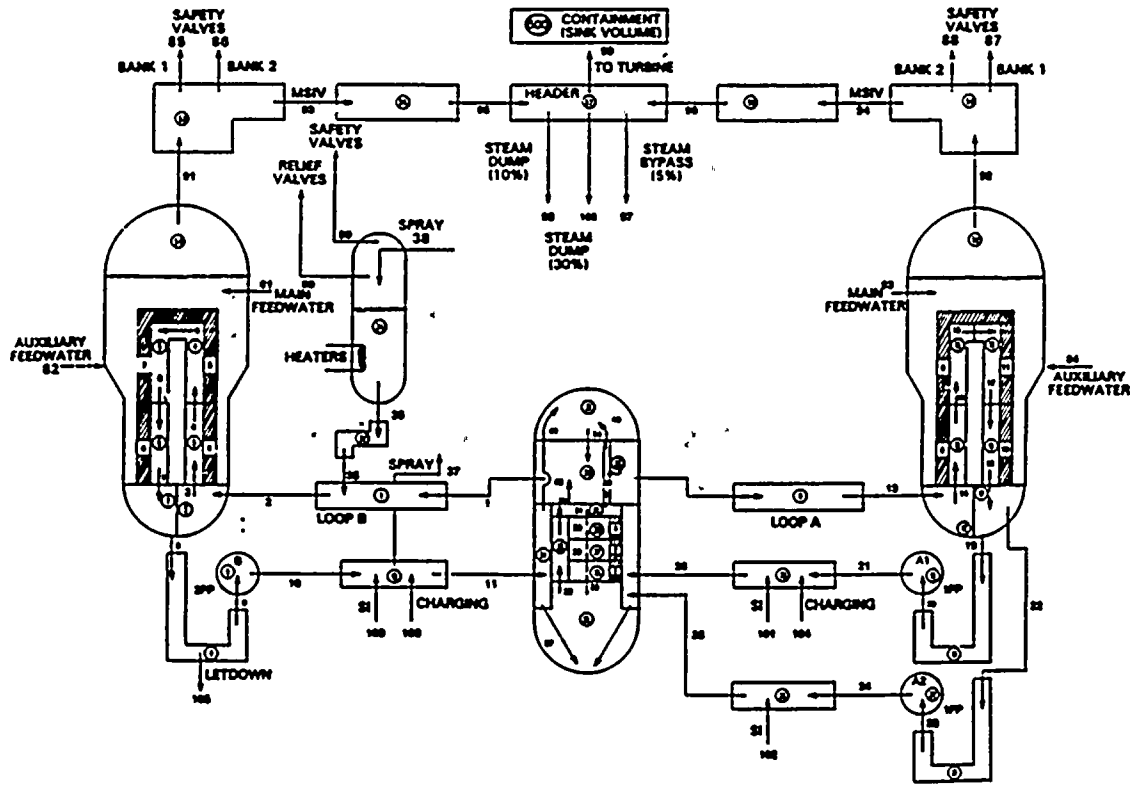
2. DEMONSTRATE UNDERSTANDING OF KEY PHYSICAL PHENOMENA AND CODE OPTIONS AND LIMITATIONS.

THE LOSS OF INVERTER EVENT AT TURKEY POINT SELECTED AS BASIS FOR EVALUATING EFFECTS OF PARAMETRIC CHANGES AND ESTABLISH IMPACT OF CODE OPTIONS AND KEY INPUTS AND ASSUMPTIONS.

CONCLUSIONS FROM ABOVE SENSITIVITY STUDIES CONSIDERED APPLICABLE TO OTHER RETRAN MODELS (ST. LUCIE 1 & 2) FOR THE ANALYSES OF EVENTS INVOLVING DECREASES IN SECONDARY HEAT REMOVAL.



Turkey Point RETRAN noding diagram



St. Lucie RETRAN noding diagram

ANALYTICAL BENCHMARKS

SENSITIVITY STUDIES:

- PRESSURIZER MODEL
  - -Spray Option
  - -Inter-region Heat Transfer Coefficient
  - -Surge Line Hydraulic Resistance

- STEAM GENERATOR MODEL
  - -Multinode versus Single Node
  - -Initial Liquid Mass Inventory
  - -Non-Equilibrium Option

- GENERAL
  - -Physics Parameters
  - -Temperature Transport Delay Option
  - -Courant Limit

ANALYTICAL BENCHMARKS

3. DEVELOP FPL METHODOLOGY FOR LICENSING ANALYSES OF EVENTS INVOLVING DECREASES IN SECONDARY HEAT REMOVAL.

SOURCES:

- STANDARD REVIEW PLANS
- KNOWLEDGE GAINED FROM IN-HOUSE BENCHMARK ANALYSES AND RELATED SENSITIVITY STUDIES.
- RESPECTIVE VENDOR METHODOLOGIES
    * ADVANCED NUCLEAR FUELS
    * COMBUSTION ENGINEERING
    * WESTINGHOUSE

FUTURE TECHNICAL SPECIFICATION CHANGES

- LOW STEAM GENERATOR LEVEL FOR ST. LUCIE UNIT 1
- REACTOR TRIP BYPASS INCREASE ON TURBINE TRIP SIGNAL
- HIGH PRESSURIZER PRESSURE TRIP SETPOINT FOR ST. LUCIE 2
- SAFETY VALVE TOLERANCE INCREASE FROM 1% TO 3%
- POSITIVE MTC INCREASE FOR ST. LUCIE UNIT 2