April 20, 1992

Docket No. 50-346

LICENSEE: TOLEDO EDISON COMPANY

FACILITY: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

SUBJECT: SUMMARY OF MEETING HELD ON MARCH 25, 1992 TO DISCUSS THE INDIVIDUAL PLANT EXAMINATION PROGRAM FOR DAVIS-BESSE (TAC NO. M74402)

On March 25, 1992, NRC staff members met at Rockville, Maryland, with employees of Toledo Edison Company (TE) to discuss the Individual Plant Examination (IPE) Program for the Davis-Besse Nuclear Power Station, Unit 1. A list of attendees is included as enclosure 1. The handout used at the meeting is included as enclosure 2.

In response to NRC staff questions, TE stated that they had focused on post-1985 data and that they would have a dependency matrix. The NRC staff informed TE that typically a team of four people would review IPE submittals. The licensee stated that they were on schedule to submit their IPE by September 1, 1992. The meeting concluded with no questions outstanding by either the NRC staff or TE.

Original Signed By:

Jon B. Hopkins, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc w/enclosures:
See next page

DISTRIBUTION

Docket File	B. Boger	OGC
NRC & Local PDRs	J. Zwolinski	E. Jordan
PDIII-3 r/f	J. Hannon	ACRS(10)
T. Murley/F. Miraglia	J. Hopkins	G. Grant
J. Partlow	P. Kreutzer	E. Greenman, RIII
L. Wheeler	C. Ader	E. Rodnick
A. Ramey-Smith	R. DePriest	R. Hernan
J. Flack		

LA:PDIII-3	PM:PDIII-3	D:PDIII-3
PKreutzer	JHopkins:sw	JHannon
4/17/92	4/17/92	4/20/92

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

April 20, 1992

Docket No. 50-346

LICENSEE: TOLEDO EDISON COMPANY

FACILITY: DAVIS-BESSE NUCLEAR POWER STATION, UNIT 1

SUBJECT: SUMMARY OF MEETING HELD ON MARCH 25, 1992 TO DISCUSS THE INDIVIDUAL PLANT EXAMINATION PROGRAM FOR DAVIS-BESSE (TAC NO. M74402)

On March 25, 1992, NRC staff members met at Rockville, Maryland, with employees of Toledo Edison Company (TE) to discuss the Individual Plant Examination (IPE) Program for the Davis-Besse Nuclear Power Station, Unit 1. A list of attendees is included as enclosure 1. The handout used at the meeting is included as enclosure 2.

In response to NRC staff questions, TE stated that they had focused on post-1985 data and that they would have a dependency matrix. The NRC staff informed TE that typically a team of four people would review IPE submittals. The licensee stated that they were on schedule to submit their IPE by September 1, 1992. The meeting concluded with no questions outstanding by either the NRC staff or TE.

Jon B. Hopkins

Jon B. Hopkins, Sr. Project Manager
Project Directorate III-3
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
As stated

cc w/enclosures:
See next page

Mr. Donald C. Sheldon

cc:

David E. Burke, Esq.
The Cleveland Electric
Illuminating Company
P. O. Box 5000
Cleveland, Ohio 44101

Mr. Robert W. Schrauder
Manager, Nuclear Licensing
Toledo Edison Company
Edision Plaza
300 Madison Avenue
Toledo, Ohio 43652

Gerald Charnoff, Esq.
Shaw, Pittman, Potts
and Trowbridge
2300 N Street N.W.
Washington, D.C. 20037

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Mr. Robert B. Borsum
Babcock & Wilcox
Nuclear Power Generation Division
1700 Rockville Pike, Suite 525
Rockville, Maryland 20852

Resident Inspector
U. S. Nuclear Regulatory Commission
5503 N. State Route 2
Oak Harbor, Ohio 43449

Mr. Donald C. Shelton
Vice President, Nuclear-Davis-Besse
Centerior Service Company
c/o Toledo Edison Company
300 Madison Avenue
Toledo, Ohio 43652

Radiological Health Program
Ohio Department of Health
1224 Kinnear Road
Columbus, Ohio 43212

Attorney General
Department of Attorney
General
30 East Broad Street
Columbus, Ohio 43215

Mr. James W. Harris, Director
Division of Power Generation
Ohio Department of Industrial
P. O. Box 825
Columbus, Ohio 43216

Ohio Environmental Protection
DERR--Compliance Unit
ATTN: Zack A. Clayton
P. O. Box 1049
Columbus, Ohio 43266-0149

President Board of Ottawa
County Commissioners
Port Clinton, Ohio 43452

State of Ohio
Public Utilities Commission
180 East Broad Street
Columbus, Ohio 43266-0573

Mr. James R. Williams
State Liaison to the NRC
Adjutant General's Department
Office of Emergency Management
Agency
2825 West Ganville Road
Columbus, Ohio 43235-2712

Mr. Murray R. Edleman
Executive Vice President -
Power Generation
Centerior Service Company
6200 Oak Tree Boulevard
Independence, Ohio 44101

Enclosure 1

ATTENDEES

March 25, 1992

NAME	ORGANIZATION
J. Hopkins	NRC
L. Wheeler	NRC
C. Ader	NRC
E. Rodnick	NRC
A. Ramey-Smith	NRC
I. Jackiw	NRC
R. DePriest	NRC
R. Hernan	NRC
J. Flack	NRC
J. Hannon	NRC
P. Smith	Toledo Edison (TE)
A. Zaskesh	TE
D. Kuhtenia	TE
C. Blay	TE
R. Zyduc	TE
S. Lewis	SAROS, INC.

INDIVIDUAL
PLANT
EXAMINATION
FOR
DAVIS-BESSE NUCLEAR POWER STATION

MEETING OBJECTIVES

- Inform NRC of Toledo Edison program
- Discuss methods, techniques, documentation
- Inform NRC of future Toledo Edison plans
- NRC discussion on issues

AGENDA

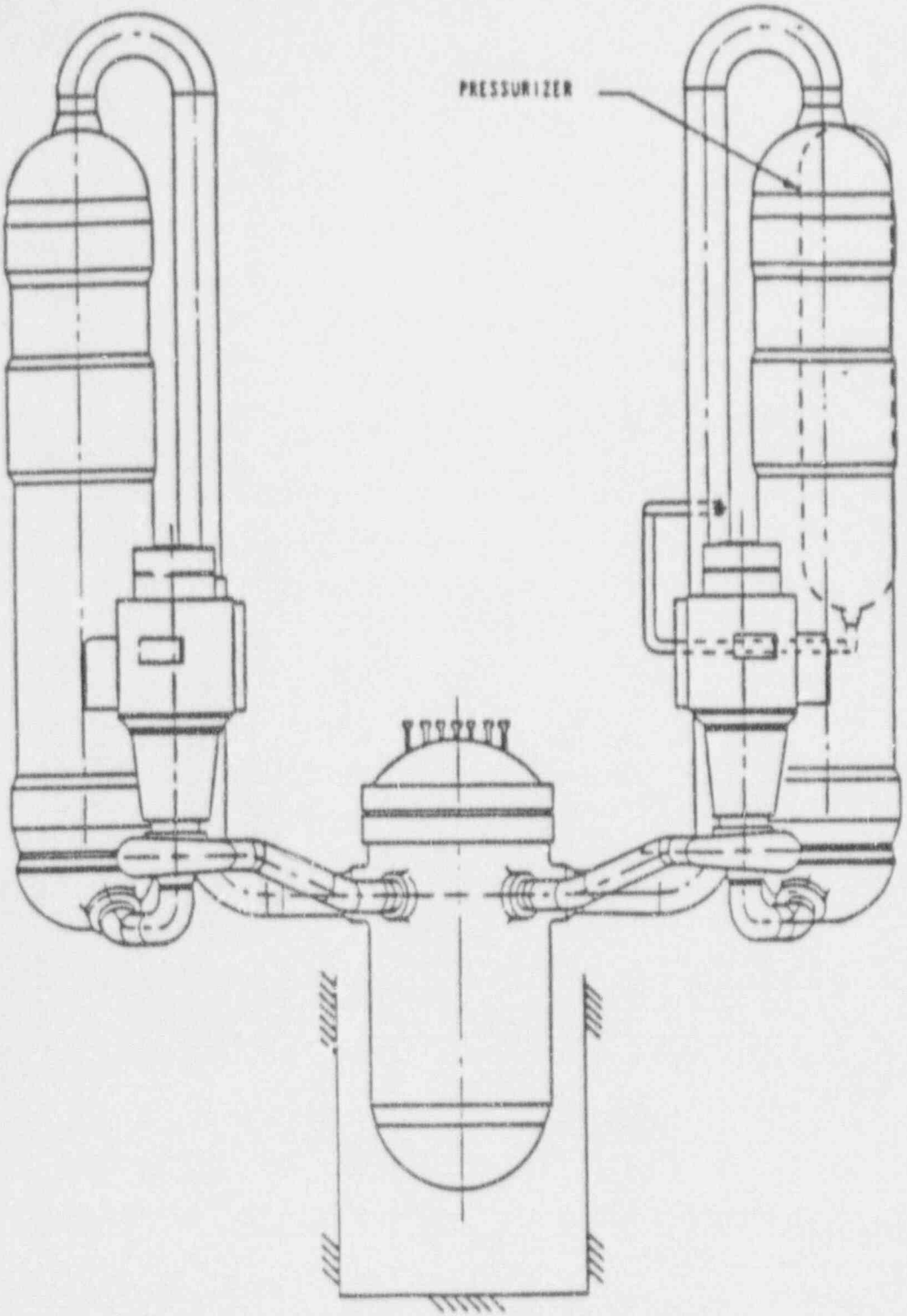
- Overview of IPE at Toledo Edison
- Level 1 analysis discussion
- Level 2 analysis discussion
- IPE future plan
- Questions and answers

OVERVIEW OF PRA AT TOLEDO EDISON

- Previous PRA commitment and work
- For GL 88-20, performing Level 2 PRA
- Analysis based on current plant

DAVIS-BESSE NUCLEAR POWER PLANT

- NSSS manufacturer and type	Babcock and Wilcox, Raised Loop PWR
- Turbine generator	General Electric
- Plant rating	2772 MWt
- Operating license date	April 22, 1977
- Containment	Large dry
- Containment design pressure	40 psig
- Containment free volume	2.834E06 cubic feet


PRESSURIZER

SCHEDULE

11/88 - NRC issues generic letter 88-20

09/89 - NRC issues NUREG-1335, "Individual Plant Examination Submittal Guidance"

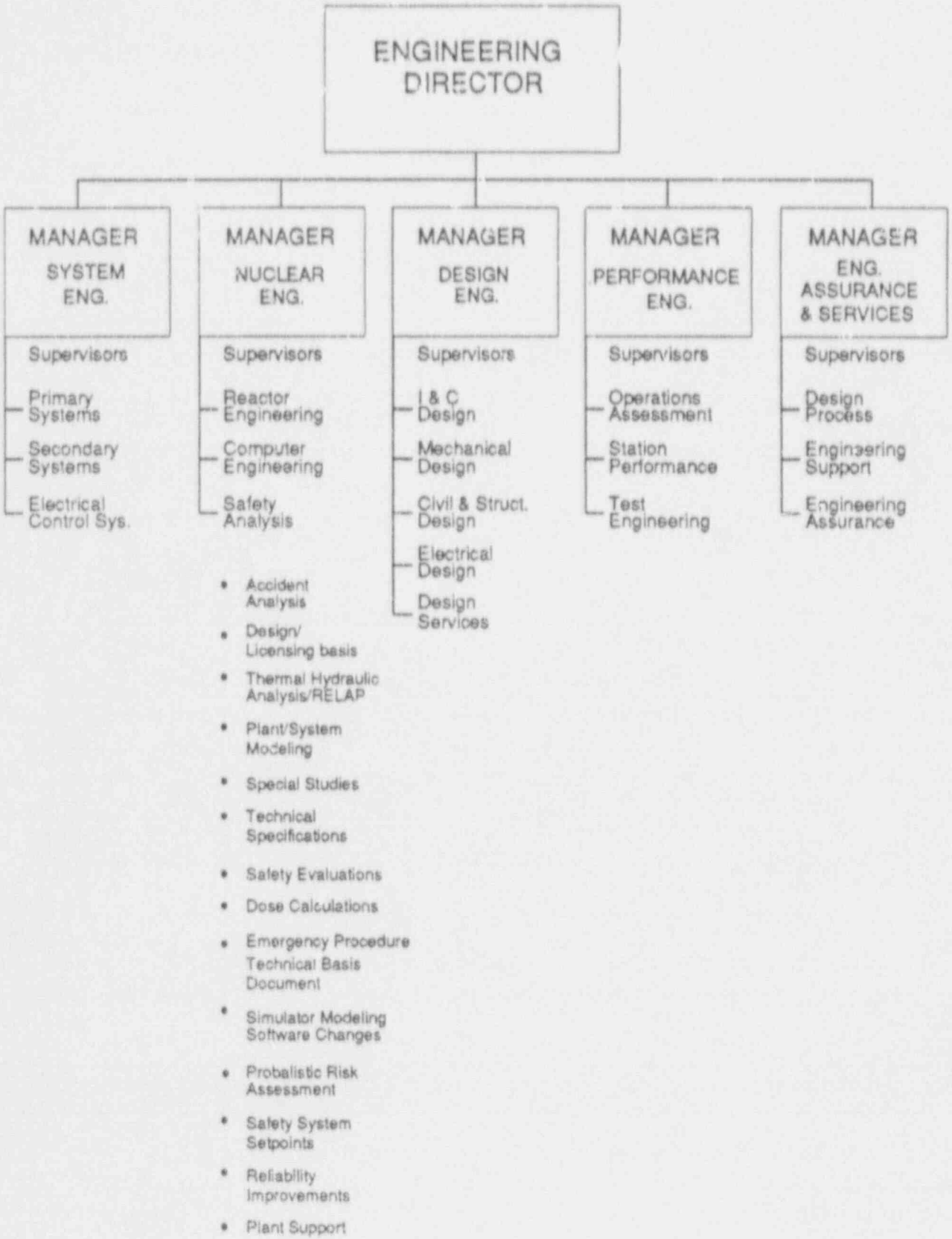
10/89 - TE submits IPE proposal to NRC

01/90 - NRC accepts TE's proposal

09/92 - IPE results due to NRC

RESOURCES

- Majority of work being performed in-house
- 3 full-time analysts
- SRO review
- Additional participation and review by Operations, Systems Engineering, Maintenance, Training, etc.
- External contractor review (SAROS, RRA, SAIC)


ENGINEERING DIRECTOR
MANAGER SYSTEM ENG.
Supervisors
Primary Systems
Secondary Systems
Electrical Control Sys.
MANAGER NUCLEAR ENG.
Supervisors
Reactor Engineering
Computer Engineering
Safety Analysis
MANAGER DESIGN ENG.
Supervisors
I & C Design
Mechanical Design
Civil & Struct. Design
Electrical Design
Design Services
MANAGER PERFORMANCE ENG.
Supervisors
Operations Assessment
Station Performance
Test Engineering
MANAGER ENG. ASSURANCE & SERVICES
Supervisors
Design Process
Engineering Support
Engineering Assurance
Accident Analysis
Design/ Licensing basis
Thermal Hydraulic Analysis/RELAP
Plant/System Modeling
Special Studies
Technical Specifications
Safety Evaluations
Dose Calculations
Emergency Procedure Technical Basis Document
Simulator Modeling Software Changes
Probalistic Risk Assessment
Safety System Setpoints
Reliability Improvements
Plant Support

LEVEL 1 PRA

Analysis of plant systems to identify core - melt sequences and their frequencies

Using small event tree - linked fault tree approach consistent with NUREG-2300

MODELING PORTION

- Develop Understanding of Plant

- Develop Logic Models
  - Event Trees
  - Fault Trees

- Develop Data Base
  - Initiating Event frequencies
  - Component Failure Rates
  - Human Error Probabilities

INITIATING EVENTS FOR DAVIS-BESSE

Disturbance that results in the degradation of one/ more systems and results in a need for a plant shutdown

Loss-of-Coolant Accidents

Steam Generator Tube Rupture

Transients

Reactor/turbine trip

Loss of main feedwater
Loss of makeup
Spurious safety features actuation
Steam generator 1 unavailable due to steamline/ feedwater line break

Loss of primary loop of service water
Loss of secondary loop of service water
Total loss of service water
Loss of operating train of component cooling water
Total loss of component cooling water
Loss of instrument air

Loss of offsite power
Loss of power from bus YAU
Loss of power from bus YBU
Loss of DC power supply for NNI-X
Loss of power from 4160 VAC bus C1
Loss of power from 4160 VAC bus D1
Loss of dc power from D1P
Loss of dc power from D2P

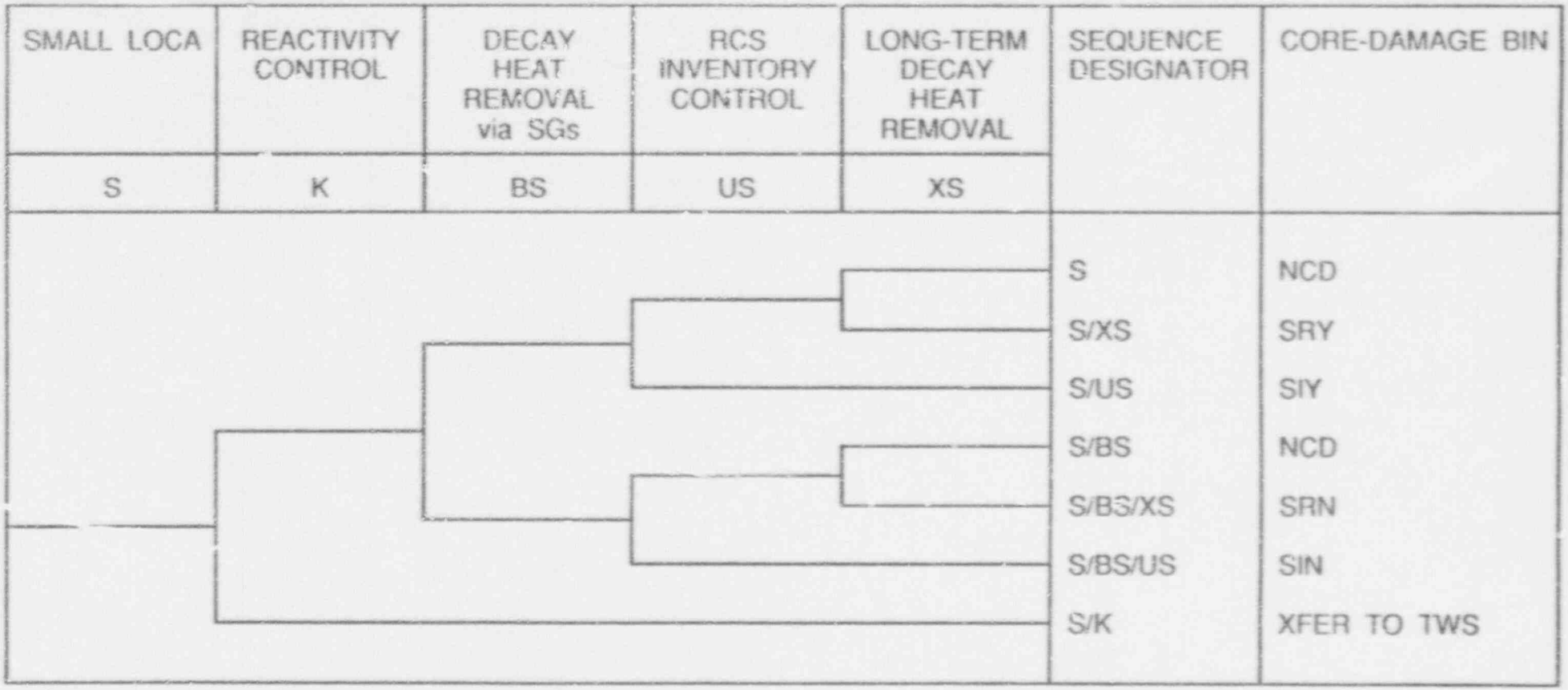
Internal Floods

SYSTEM MODELING

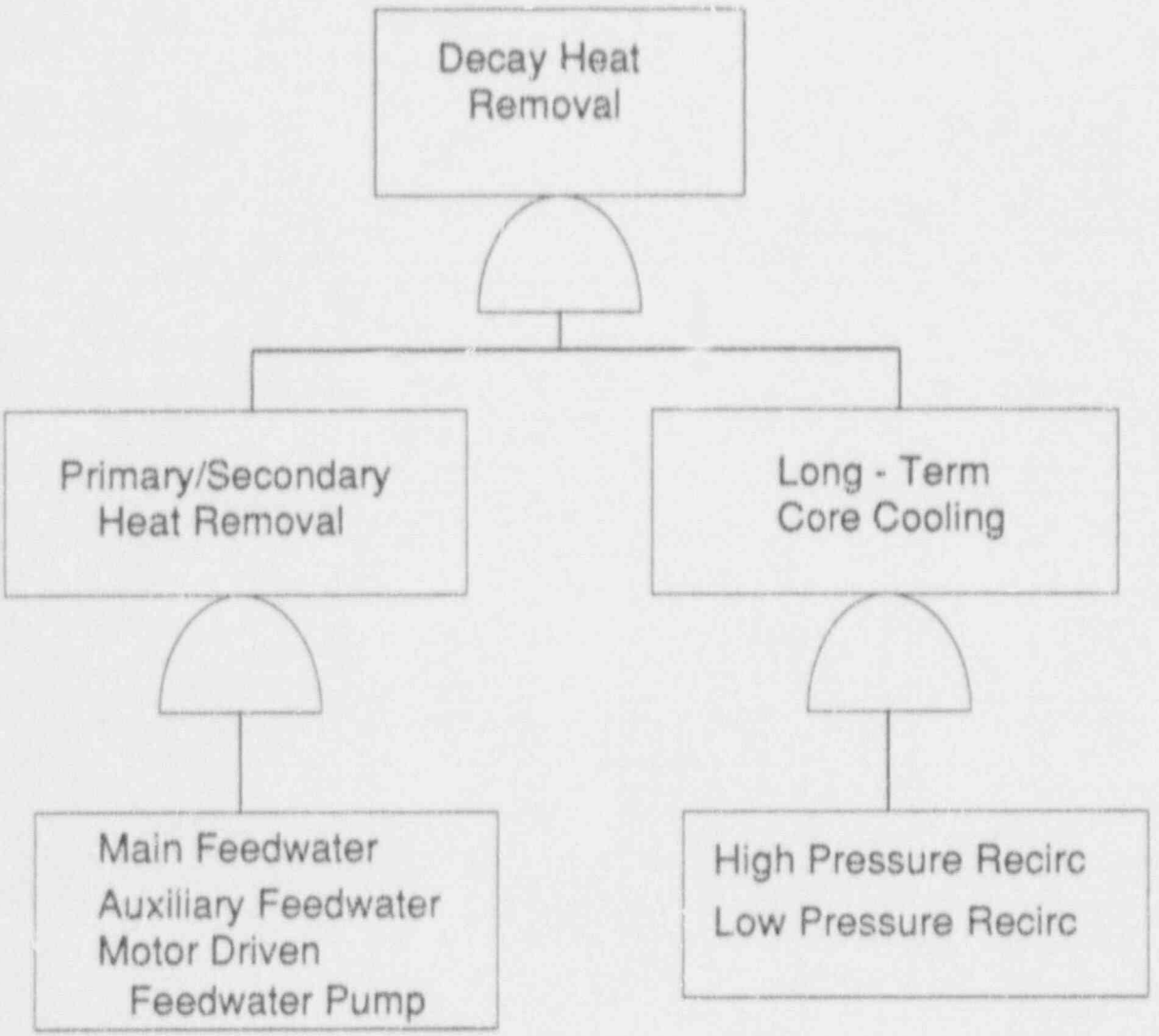
- Fault trees
- Includes support system dependencies
- Includes initiating events
- Using EPRI sponsored CAFTA computer code

SUCCESS CRITERIA

- USAR/MAAP/RELAP
- Results of this analysis are a set of functional event trees
- Developed for classes of initiating events
- Developed in terms of safety functions


SMALL LOCA
REACTIVITY CONTROL
DECAY HEAT REMOVAL via SGs
RCS INVENTORY CONTROL
LONG-TERM DECAY HEAT REMOVAL
SEQUENCE DESIGNATOR
CORE-DAMAGE BIN
S
K
BS
US
XS
S
NCD
S/XS
SRY
S/US
SIY
S/BS
NCD
S/BS/XS
SRN
S/BS/US
SIN
S/K
XFER TO TWS

SAFETY FUNCTION



DATA ANALYSIS

- Derived from generic and plant-specific sources

- Initiating event frequencies

- Component failure rates

- Maintenance & Testing Unavailabilities

HUMAN RELIABILITY ANALYSIS

- Overall analysis - EPRI SHARP 1

- Quantification using current methods

  - THERP Approach - pre-initiator
  - EPRI - cognitive portion of post-initiator
  - THERP Approach - execution portion of post-initiator

- Plant-specific simulator exercises

QUANTIFY SEQUENCE FREQUENCIES

- Evaluate event tree / fault tree models
- Apply data to assess frequencies of sequences
- Examine results

RECOVERY ANALYSIS

- Proceduralized
- Other equipment
- Timing

UNCERTAINTY ANALYSIS

- Objectives
- Sensitivity studies

ADDITIONAL REQUIREMENTS

- USI A-45, "Shutdown Decay Heat Removal Requirements"

- Internal flooding aspect of USI A-17, "System Interaction"

BACK-END ANALYSIS

- Thermal-hydraulic analysis of core and containment response

- Binning of core damage sequences into plant damage states

- Plant-Specific CET model

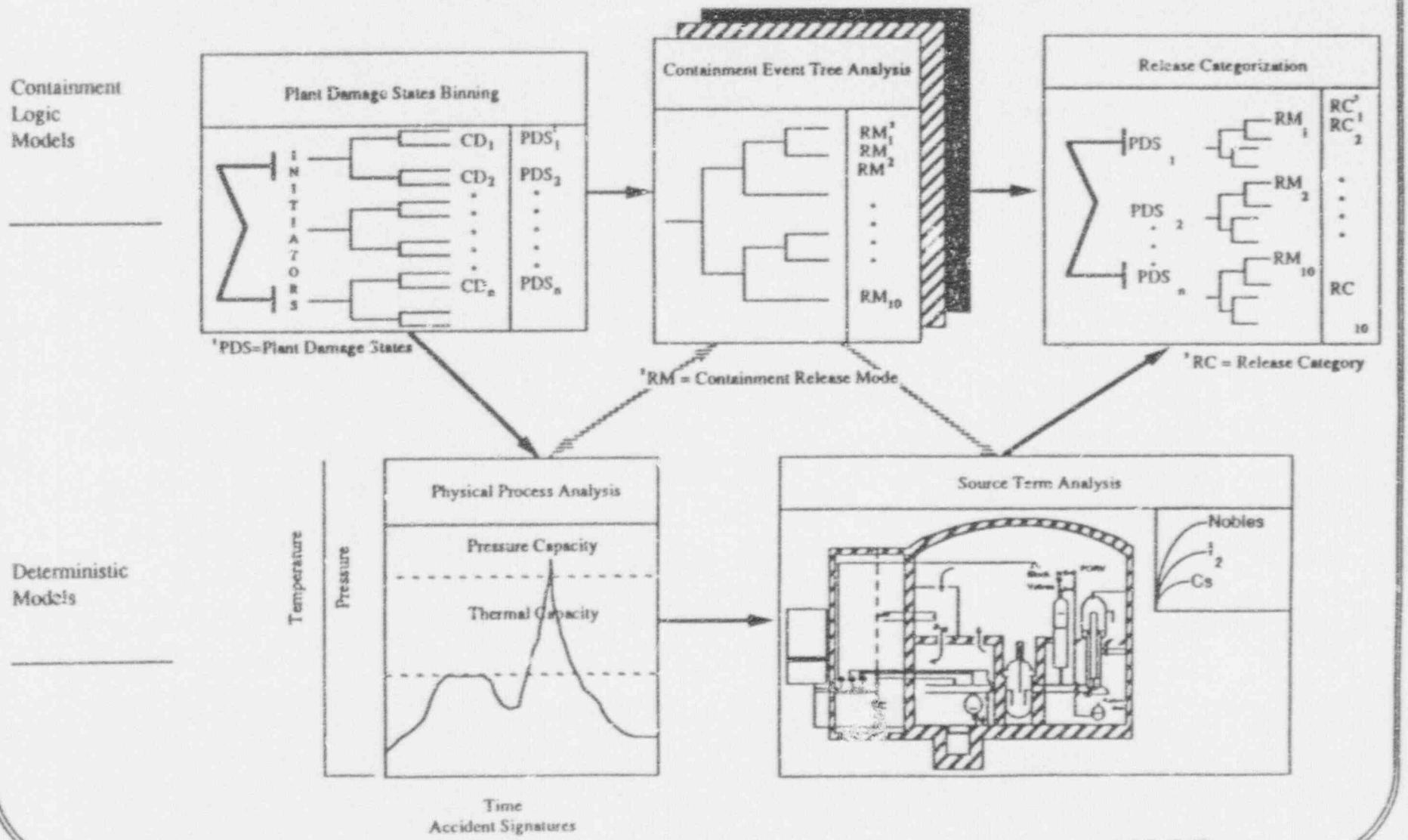
- Quantifying CET branch points using reference analysis or plant-specific calculations, e.g., CTMT failure characterization

- Estimating radionuclide releases

- Evaluate uncertainties

EPRI/NPD

Pictorial Representation of Level 2 Analysis Tasks



NSAC

COMPUTER MODELING

- MAAP 3.0B - Rev. 18 as "IPE Version"

- Plant Specific Input Deck
  ("Parameter File")

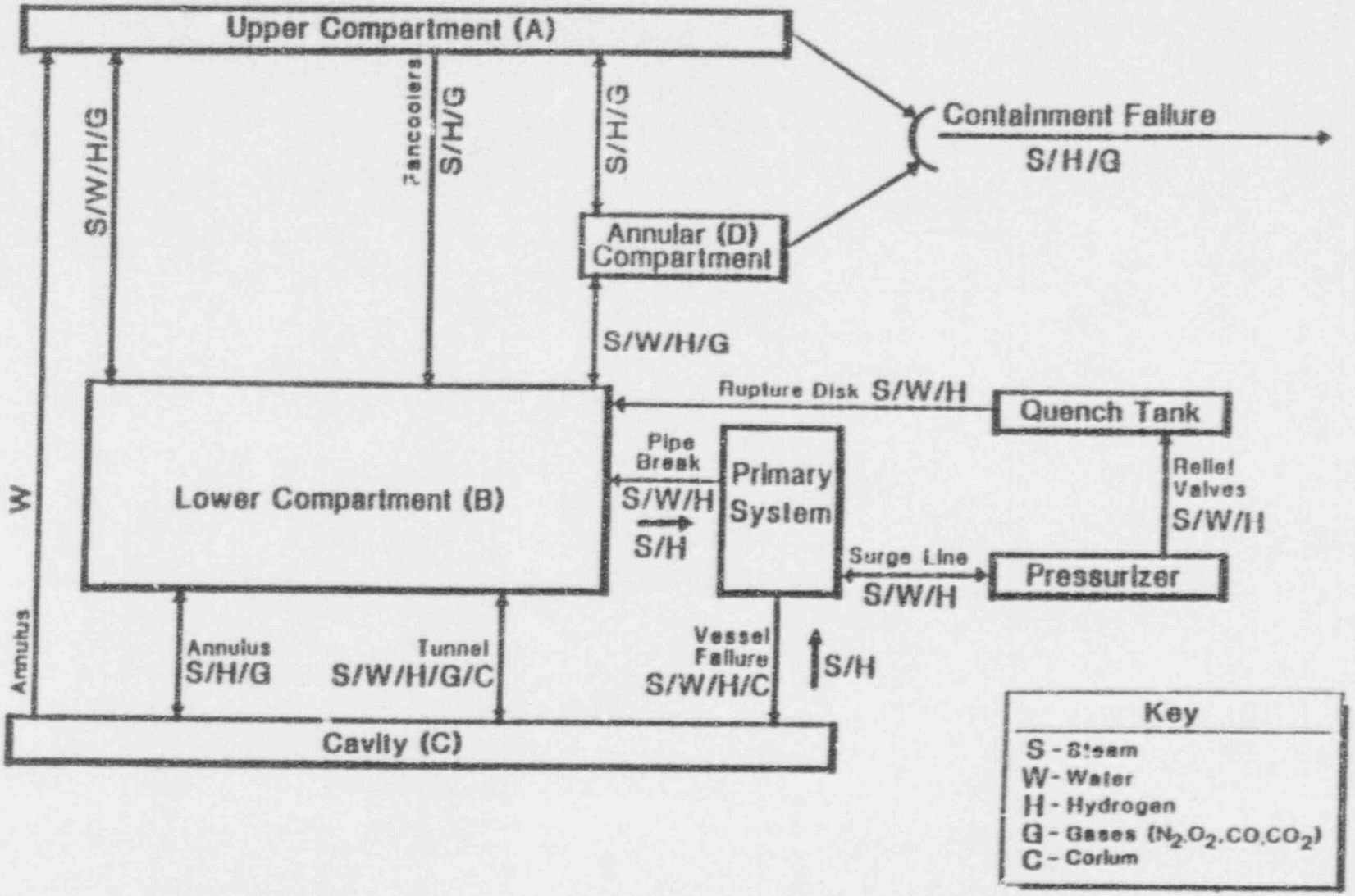
- MAAP Users Group Participation
  - T-H Upgrades for B&W Plants
  - Sensitivity Study Guidance
  - QA

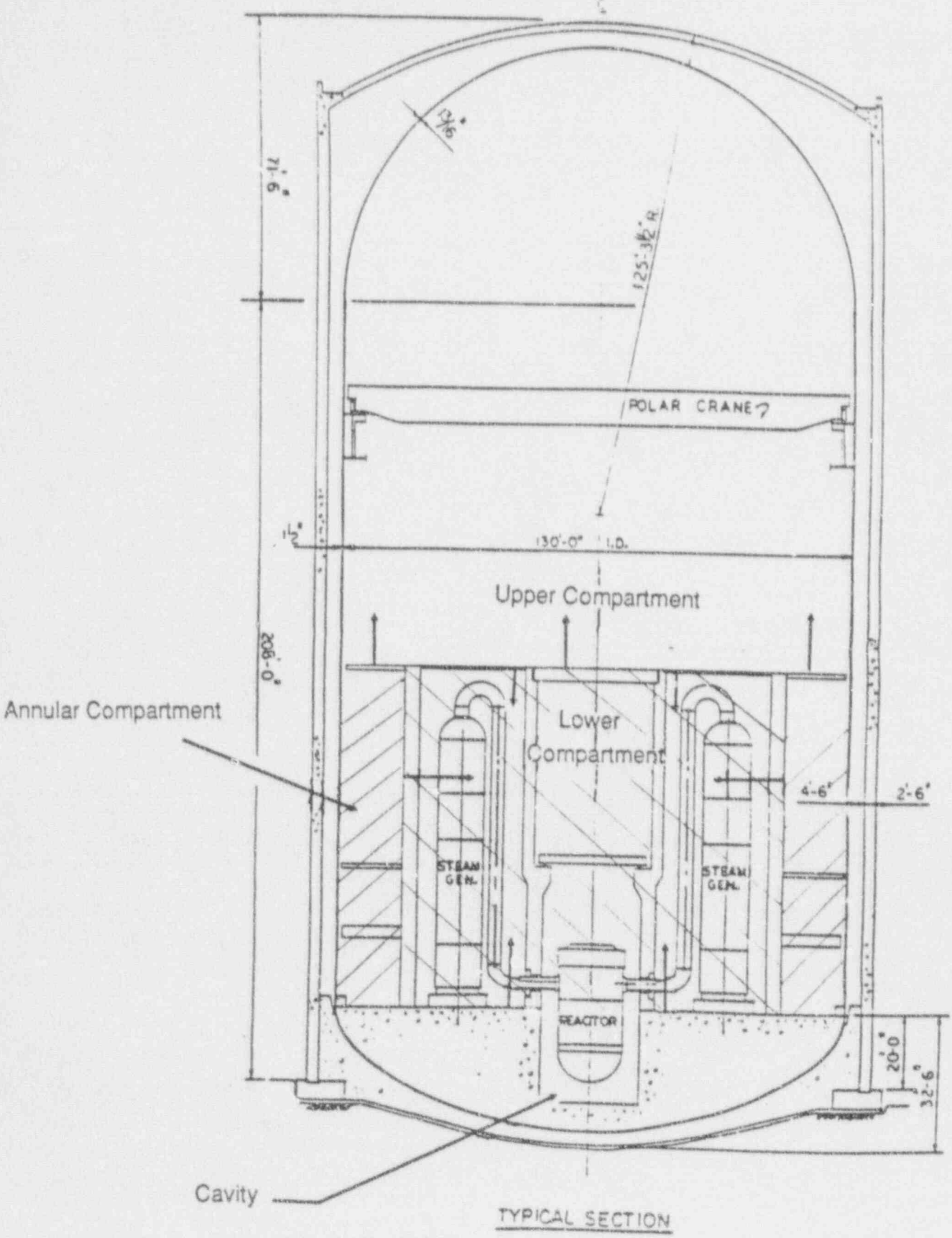
MAAP FEATURES

- FULLY PARALLEL - PHENOMENOLOGY NOT CONSTRAINED TO OCCUR SEQUENTIALLY.
- MODULAR - RELATIVELY EASY TO ADD NEW COMPARTMENTS TO IMPROVE PHENOMENOLOGICAL MODELS.
- MODELS WIDE VARIETY OF PHENOMENA, ENGINEERED SAFEGUARDS, AND OTHER PLANT SYSTEMS.
- MODELS WIDE VARIETY OF DESIGNS.
- PHENOMENOLOGICAL MODELS SIMPLE BUT BACKED UP BY WORK OF IDCOR SUBTASKS.
- EXTENSIVE CAPABILITY FOR OPERATOR INTERVENTIONS.
- FAST-RUNNING.

MAAP FEATURES

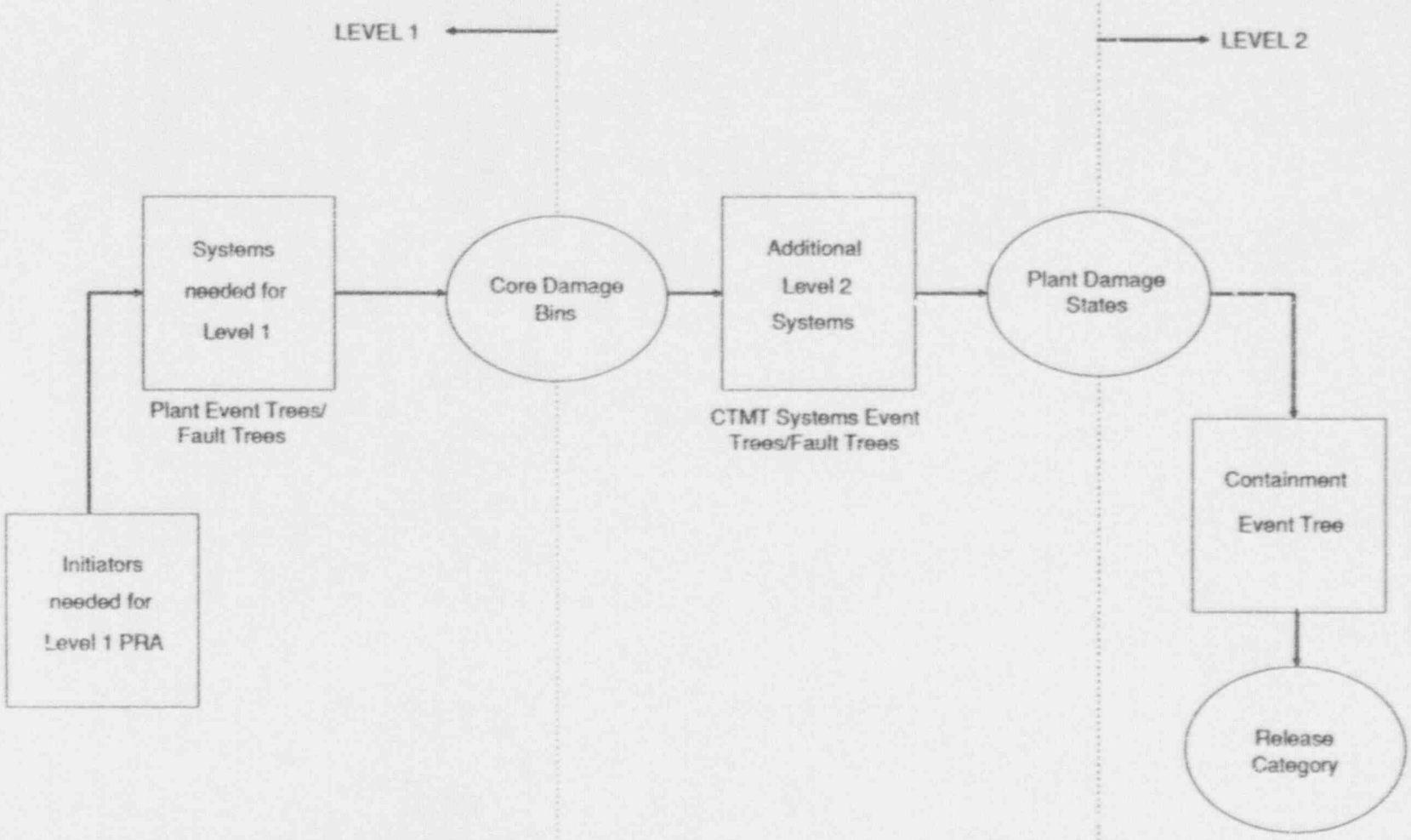
- FULLY PARALLEL - PHENOMENOLOGY NOT CONSTRAINED TO OCCUR SEQUENTIALLY.
- MODULAR - RELATIVELY EASY TO ADD NEW COMPARTMENTS TO IMPROVE PHENOMENOLOGICAL MODELS.
- MODELS WIDE VARIETY OF PHENOMENA, ENGINEERED SAFEGUARDS, AND OTHER PLANT SYSTEMS.
- MODELS WIDE VARIETY OF DESIGNS.
- PHENOMENOLOGICAL MODELS SIMPLE BUT BACKED UP BY WORK OF IDCOR SUBTASKS.
- EXTENSIVE CAPABILITY FOR OPERATOR INTERVENTIONS.
- FAST-RUNNING.


Upper Compartment (A)
S/W/H/G
Fancoolers
S/H/G
S/H/G
Containment Failure
S/H/G
Annular (D) Compartment
S/W/H/G
Rupture Disk S/W/H
Quench Tank
Pipe Break
S/W/H
S/H
Primary System
Relief Valves
S/W/H
Lower Compartment (B)
Surge Line
S/W/H
Pressurizer
W
Annulus
Annulus
S/H/G
Tunnel
S/W/H/G/C
Vessel Failure
S/W/H/C
S/H
Cavity (C)
Key
S - Steam
W - Water
H - Hydrogen
G - Gases (N_2,O_2,CO,CO_2)
C - Corium



D-B Containment Nodalization

LEVEL 1 / 2 INTERFACE



CORE DAMAGE BINS

- Type of Accidents

- SG Heat Removal

- ECCS Status

CONTAINMENT SYSTEMS EVENT TREE

- Containment Isolation

- Containment Heat Removal

- Containment Spray

SEVERE ACCIDENT CLOSURE SUBMITTAL CONTENT

An integrated evaluation of all four severe accident policy licensee elements.

- Individual Plant Examination
- Individual Plant Examination external events
- Containment performance improvements
- Accident management

PRA APPLICATIONS

- Supporting analysis for JCO
- Temporary or permanent Tech Spec. changes (AOT)
- Plant control and management (prioritizing plant changes)
- 10 CFR 50.59 safety evaluations
- Accident management support
- Emergency planning (EALS, EPZ, scenario development)
- FMEAS
- Training (operators)
- Evaluation of changes to EOPs
- Evaluation of regulatory issues (Generic and Plant Specific)
- Plant life extension program
- Maintenance (PM scope, RCM input, priorities, etc.)
- Safety significance of operational events (LER)

OVERALL RESULTS

- Key contributors to core damage frequency will be determined via the analyses

- IPE will identify outliers/vulnerabilities

- Living PRA

- We have identified improvement opportunities in the past, acted upon and made changes through existing process

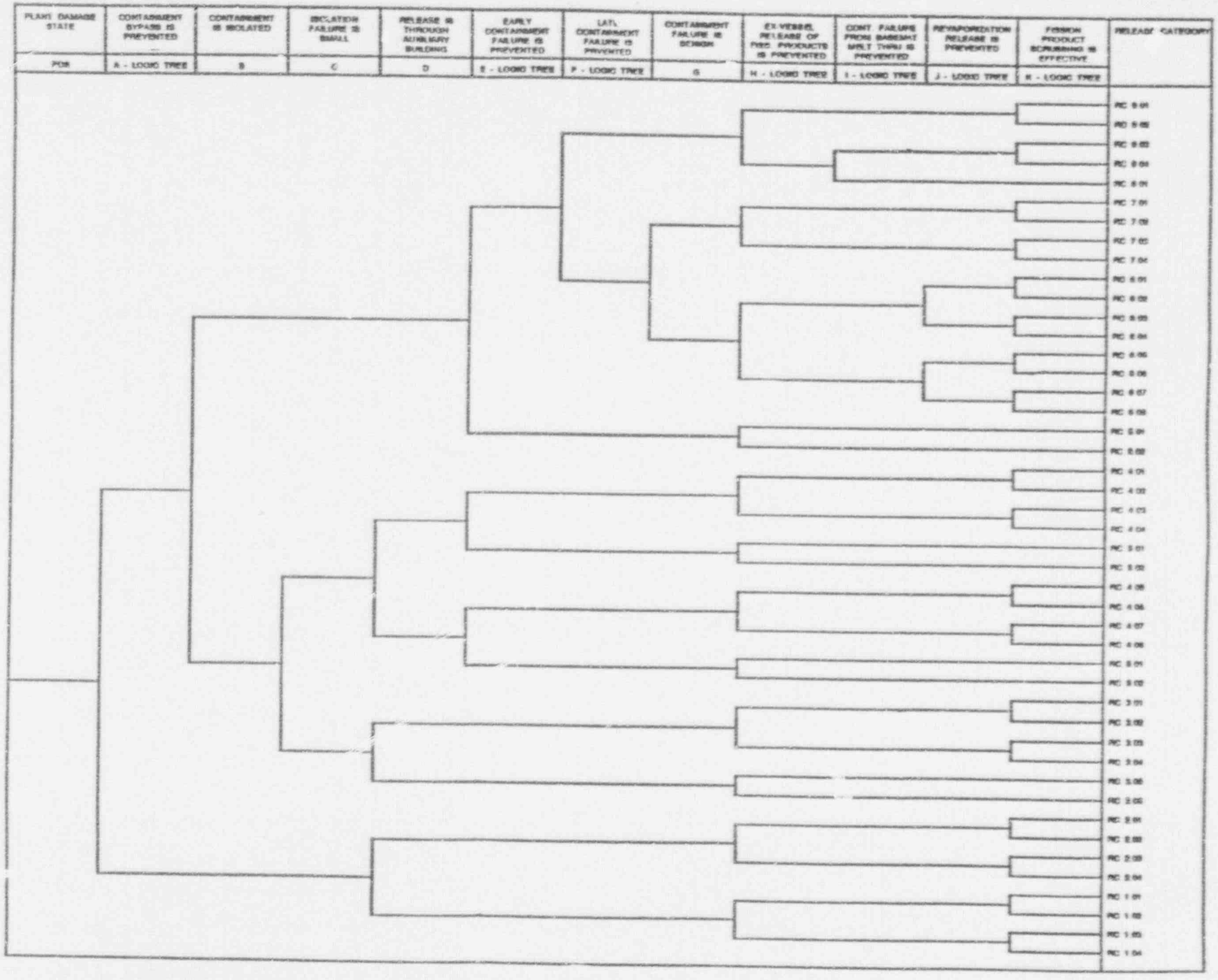
LEVEL 2 RESULTS

- Release categories

- Frequency and magnitude of release

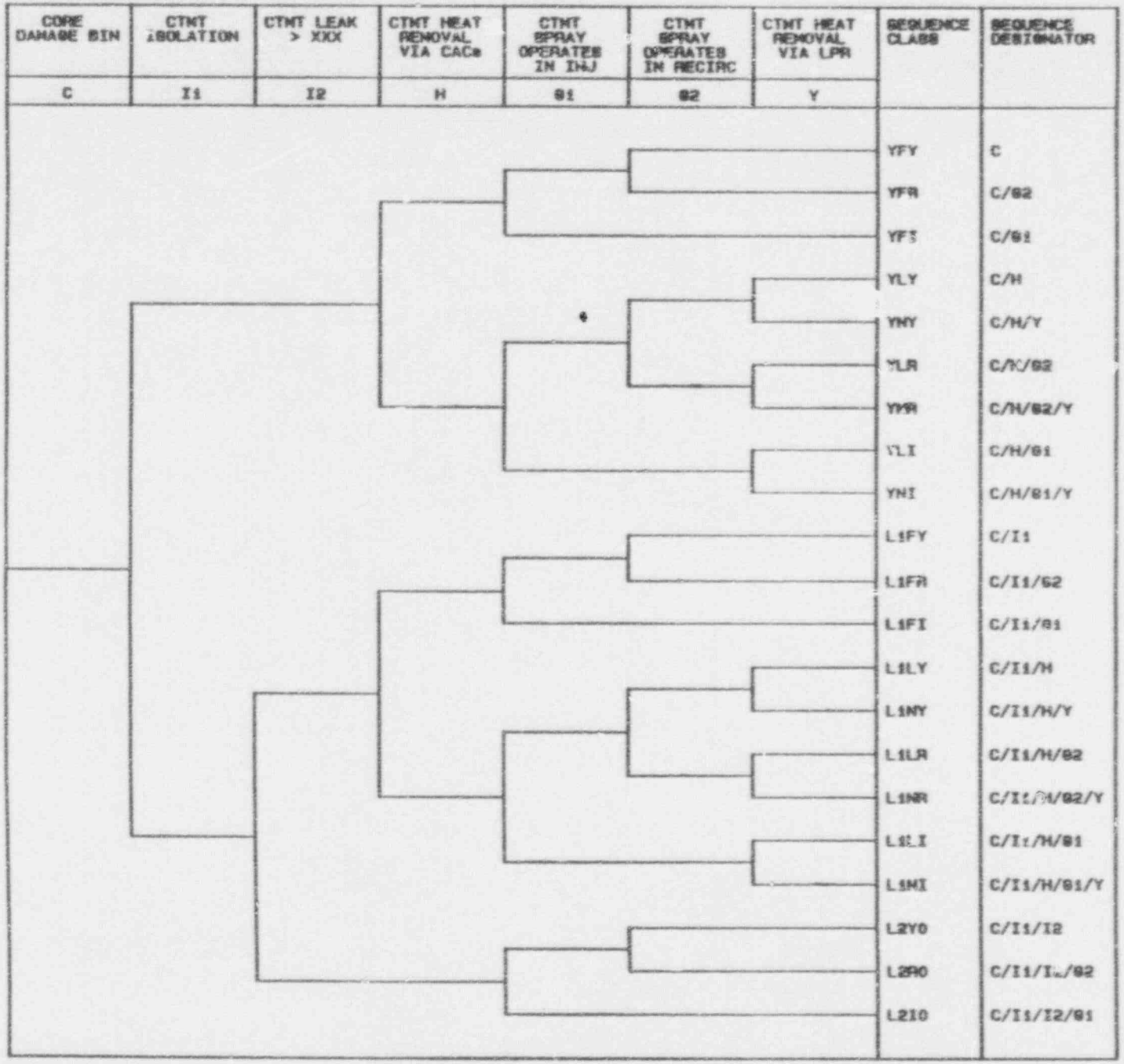
CET QUANTIFICATION

- Phenomonology
  - MAAP
  - NUREG-1150
  - Research
- Fission product release & transport
  - MAAP release fractions
  - In-vessel transport
  - Containment transport
- Uncertainty evaluation


PLANT DAMAGE STATE
POS
CONTAINMENT BYPASS IS PREVENTED
A - LOGIC TREE
CONTAINMENT IS ISOLATED
B
ISOLATION FAILURE IS SMALL
C
RELEASE IS THROUGH AUXILIARY BUILDING
D
EARLY CONTAINMENT FAILURE IS PREVENTED
E - LOGIC TREE
LATE CONTAINMENT FAILURE IS PREVENTED
F - LOGIC TREE
CONTAINMENT FAILURE IS DOMINA
G
EX-VESSEL RELEASE OF FISS. PRODUCTS IS PREVENTED
H - LOGIC TREE
CONT. FAILURE FROM BASEMAT MELT THRU IS PREVENTED
I - LOGIC TREE
REVAPORIZATION RELEASE IS PREVENTED
J - LOGIC TREE
FISSION PRODUCT SCRUBBING IS EFFECTIVE
K - LOGIC TREE
RELEASE CATEGORY
PC 6.01
PC 6.02
PC 6.03
PC 6.04
PC 6.05
PC 7.01
PC 7.02
PC 7.03
PC 7.04
PC 6.01
PC 6.02
PC 6.03
PC 6.04
PC 6.05
PC 6.06
PC 6.07
PC 6.08
PC 5.01
PC 5.02
PC 4.01
PC 4.02
PC 4.03
PC 4.04
PC 5.01
PC 5.02
PC 4.05
PC 4.06
PC 4.07
PC 4.08
PC 5.01
PC 5.02
PC 3.01
PC 3.02
PC 3.03
PC 3.04
PC 3.05
PC 3.06
PC 2.01
PC 2.02
PC 2.03
PC 2.04
PC 1.01
PC 1.02
PC 1.03
PC 1.04

CONTAINMENT EVENT TREE

- Adapting B&WOG CET (Duke and B&W)
- Small Event Tree / Decision Trees (Fault Trees)
- Incorporating D-B Specifics
- Evaluating "Other" insights
  - CPIP
  - Industry
  - Research


CORE DAMAGE BIN
CTMT ISOLATION
CTMT LEAK > XXX
CTMT HEAT REMOVAL VIA CACs
CTMT SPRAY OPERATES IN INJ
CTMT SPRAY OPERATES IN RECIRC
CTMT HEAT REMOVAL VIA LPR
SEQUENCE CLASS
SEQUENCE DESIGNATOR
C
I1
I2
H
S1
S2
Y
YFY
C
YFR
C/S2
YFI
C/S1
YLY
C/H
YNY
C/H/Y
YLR
C/H/S2
YNR
C/H/S2/Y
YLI
C/H/S1
YNI
C/H/S1/Y
L1FY
C/I1
L1FR
C/I1/S2
L1FI
C/I1/S1
L1LY
C/I1/H
L1NY
C/I1/H/Y
L1LR
C/I1/H/S2
L1NR
C/I1/H/S2/Y
L1LI
C/I1/H/S1
L1NI
C/I1/H/S1/Y
L2Y0
C/I1/I2
L2R0
C/I1/I2/S2
L2I0
C/I1/I2/S1