ACRS SUBCOMMITTEE ON CESSAR
AGENDA - NOVEMBER 19, 1981
WINDSOR, CONN.

	SPEAKER	PRESENTATION TIME	ACTUAL TIME
I. INTRODUCTION			
A. SUBCOMMITTEE CHAIRMAN'S OPENING STATEMENT	M. BENDER (ACRS)	5 MIN.	8:00 - 8:05 am
B. NRC			
1. OVERVIEW OF FDA REVIEW	C. GRIMES (NRC)	5 MIN.	8:05 - 8:15 am
2. SER OPEN ITEMS	C. GRIMES (NRC)	5 MIN.	8:15 - 8:25 am
C. COMBUSTION ENGINEERING (C-E)			
1. INTRODUCTION	D. E. LYONS/ P. L. McGILL	5 MIN.	8:25 - 8:35 am
2. RESPONSE TO SER OPEN ITEMS	A. E. SCHERER	5 MIN.	8:35 - 8:45 am
II. DISCUSSION OF FDA REVIEW ISSUES			
A. CESSAR FSAR			
1. C-E APPROACH TO STANDARDIZATION	A. E. SCHERER	5 MIN.	8:45 - 8:55 am
2. PLANTS EXPECTED TO REFERENCE CESSAR-F	A. E. SCHERER	5 MIN.	8:55 - 9:05 am
3. SCOPE OF CESSAR-F	G. A. DAVIS	10 MIN.	9:05 - 9:25 am
a. REGULATORY UPDATE			
b. APPLICABLE TMI ISSUES			
c. INTERFACES			

ATTACHMENT 1

ACRS SUBCOMMITTEE ON CESSAR
AGENDA - NOVEMBER , 1981
WINDSOR, CONN.
(Cont'd)

	SPEAKER	PRESENTATION TIME	ACTUAL TIME
II. DISCUSSION OF FDA REVIEW ISSUES (Cont'd)			
B. DESCRIPTION OF SYSTEM 80 NSSS	R. W. KNAPP		
1. OVERVIEW OF DESIGN		5 MIN.	9:25 - 9:35 am
2. UNIQUE FEATURES		5 MIN.	9:35 - 9:45 am
3. COMPARISON WITH OTHER C-E PLANTS		5 MIN.	9:45 - 9:55 am
– BREAK –		10 MIN.	9:55 - 10:05 am
C. SELECTED DESIGN FEATURES			
1. DECAY HEAT REMOVAL (INCLUDING DISCUSSION OF FEED AND BLEED)	R. S. TURK	5 MIN.	10:05 - 10:15 am
2. SEISMIC DESIGN	T. E. NATAN	5 MIN.	10:15 - 10:25 am
3. ACCIDENT MONITORING SYSTEM	J. L. PUCAK	5 MIN.	10:25 - 10:35 am
D. TRANSIENT AND ACCIDENT RESPONSE (INCLUDING PRESSURIZED THERMAL SHOCK)	C. L. KLING	10 MIN.	10:35 - 10:55 am
E. SUPPORT GIVEN TO UTILITY	J.M. WESTHOVEN	5 MIN.	10:55 - 11:05 am

ACRS SUBCOMMITTEE ON CESSAR
AGENDA - NOVEMBER 19, 1981
WINDSOR, CONN.
(Cont'd)

	SPEAKER	PRESENTATION TIME	ACTUAL TIME
III. DETAILED RESPONSE TO ACRS LETTER OF SEPTEMBER 15, 1975			
A. COMBUSTION ENGINEERING PRESENTATION		45 MIN.	11:05 - 12:35 pm
– PROGRAM TO PERMIT DESIGN CHANGES	G.A. DAVIS	5 MIN. PER ITEM	
– PROTECTION AGAINST SABOTAGE	G.A. DAVIS		
– GENERIC REVIEW OF LUBE OIL AND COOLING WATER FAILURES	J.E. WATERS		
– MAINTENANCE, INSPECTION, AND OPERATIONAL NEEDS THROUGHOUT LIFE	G.F. CARUTHERS		
– CLEANING AND DECONTAMINATION	G.F. CARUTHERS		
– DECOMMISSIONING	G.F. CARUTHERS		
– CHANGES MADE TO CPCS AND COLSS FROM ANO-2 EXPERIENCE	D.S. BERTO		
– OPERATING EXPERIENCE WITH 16 x 16 FUEL	M.G. ANDREWS		
– IMPROVEMENTS IN ECCS SYSTEMS AND MODELS	J. LONGO		
– BEST ESTIMATE ANALYSES IN DESIGN	J. LONGO		
– LUNCH –			12:35 - 1:35 pm
B. NRC STAFF PRESENTATION		30 MIN.	1:35 - 2:35 pm
IV. ACRS CONCLUDING REMARKS AND DISCUSSION OF FUTURE AGENDA ITEMS	M. BENDER	10 MIN.	2:35 - 2:45 pm
V. ADJOURN			2:45 pm

TIME 8:00 AM. MEETING ROOM

DATE 11-19-81

ATTACHMENT 2

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

MEETING

CESSAR

ATTENDEES PLEASE SIGN BELOW

	(PLEASE PRINT) NAME	BADGE NO.	AFFILIATION
1	C I. GRIMES		NRC/DL
2	J.R. MILLER		NRC/DL
3	J. KERRIGAN		NRC/DL
4	G.A. Davis		C-E
5	AE SCHERER		CE
6	DE CYONS		CE
7	J. M. WESTHOVEN		C-E
8	F. Bevilacqua		C-E
9	P.L. McGill		C-E
10	J.R. DIETRICH		C-E
11	W.R. CORCORAN		C-E
12	C.M. Molnar		C-E
13	E.S. Markowski		C-E
14	J.E. MAYERS		C-E
15	G F Cauthen		C-E
16	C. A. Birchoff		Sne 11 & Wilmer
17	T.F. QUAN		ARIZONA PUBLIC SERVICE
18	J. ALLEN		ARIZONA Public Service
19	E.E. VAN BRUNT JR		Arizona Public Service Co.
20	WES HARTLEY		" " "

TIME 8:00 A.m.

MEETING ROOM ____________

DATE 11-19-81

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

MEETING

CESSAR

ATTENDEES PLEASE SIGN BELOW

(PLEASE PRINT) NAME	BADGE NO.	AFFILIATION
1 [illegible]		Arizona Public Service
2 William J Gill		CE
3 Kenneth W Cook		Washington Pub. Power Supply System
4 Kenneth M O'Hara		EBASCO Services Inc.
5 William [illegible]		Bechtel Power Corp
6 [illegible]		C-E
7 Robert C. Marshall		CE
8 [illegible]		[illegible]
9 T G OBER		CE
10 Robert Sterling		CE
11		CE
12 [illegible] Ferguson		C-E
13 RH Young		C-E
14 Vincent Callaghan		C-E
15 RP Jewell		C-E
16 T. R. Young		C-E
17 [illegible] KOPCHINSKI		BECHTEL POWER
18 R. [illegible]		C-E
19 B Newcomb		C-E
20 Carl H. Nevschander		CE

TIME [illegible] A.M.   MEETING ROOM [illegible]

DATE 11-19-81

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

MEETING

CESSAR

ATTENDEES PLEASE SIGN BELOW

(PLEASE PRINT) NAME ~~R G. Foster~~	BADGE NO.	AFFILIATION
1 R. G. Foster		CE
2 J. D. Kueck		C-E
3 RF von H ll		E
4 [illegible]		CE
5 [illegible]		C-E
6 W. N. Gardner		C-E
7 S. A. Webster		C-E
8 C. L. Kling		C-E
9 W. O'Hara		C-E
10 S. E. Weismantel		C-E
11 J. H. Fittz		C-E
12 [illegible]		C-E
13 [illegible]		C-E
14 [illegible]		C-E
15 [illegible]		C-E
16		
17		
18		
19		
20		

TIME

DATE 11-19-81

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

MEETING

CESSAR

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TIME 8:00 A.M. MEETING ROOM _____

DATE 11-19-81

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

MEETING

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TIME 8:00 A.M. MEETING ROOM

DATE 11-19-81

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

MEETING

CESSAR

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"CESSAR-F"

(COMBUSTION ENGINEERING

STANDARD SAFETY ANALYSIS REPORT - FSAR)

CESSAR-F IS THE LICENSING DOCUMENT THAT

DESCRIBES THE SYSTEM 80™ NSSS DESIGN

ATTACHMENT 3

NRC POLICY STATEMENT
ON STANDARDIZATION

OPTIONS:

REFERENCE SYSTEM CONCEPT

DUPLICATE PLANT CONCEPT

MANUFACTURING LICENSE CONCEPT

REPLICATE PLANT CONCEPT

NRC POLICY STATEMENT
ON STANDARDIZATION

OPTIONS:

- REFERENCE SYSTEM CONCEPT
  - PRELIMINARY DESIGN APPROVAL (PDA)
  - FINAL DESIGN APPROVAL (FDA)
- DUPLICATE PLANT CONCEPT
- MANUFACTURING LICENSE CONCEPT
- REPLICATE PLANT CONCEPT

CESSAR-P WAS REFERENCED BY:

ARIZONA PUBLIC SERVICE

PALO VERDE 1, 2, 3, 4, & 5

WASHINGTON PUBLIC POWER SUPPLY SYSTEM

WPPSS 3 & 5

TENNESSEE VALLEY AUTHORITY

YELLOW CREEK 1 & 2

DUKE POWER COMPANY

CHEROKEE 1, 2, & 3

PERKINS 1, 2, & 3

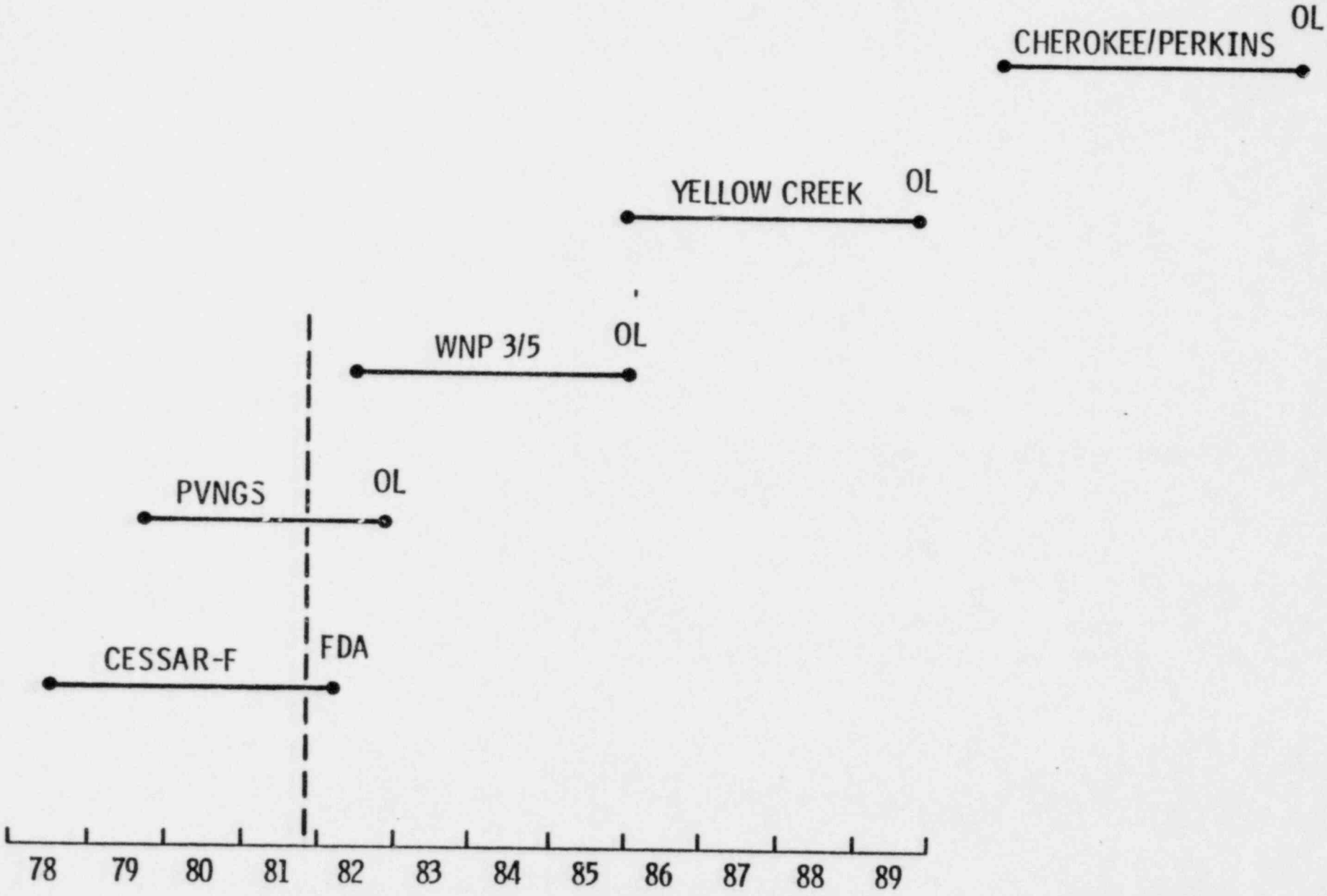
NEW YORK STATE ELECTRIC AND GAS

NEW HAVEN 1 & 2

PRESENT SYSTEM 80 CUSTOMERS
EXPECTED TO REFERENCE CESSAR-F

UTILITY	PLANT	No. OF UNITS	CONSTRUCTION PERMIT ISSUED
ARIZONA PUBLIC SERVICE (APS)	PALO VERDE NUCLEAR GENERATING STATION (PVNGS)	3	MAY 1976
WASHINGTON PUBLIC POWER SUPPLY SYSTEM (WPPSS)	WPPSS NUCLEAR PROJECT	2	APRIL 1978
TENNESSEE VALLEY AUTHORITY (TVA)	YELLOW CREEK	2	NOVEMBER 1978
DUKE POWER COMPANY	CHEROKEE	3	DECEMBER 1977
	PERKINS	3	PENDING

ANTICIPATED FSAR LICENSING SCHEDULES FOR PRESENT SYSTEM 80 OWNERS



CESSAR-F IS APPLYING FOR FDA-1

ADDRESSES ALL APPLICABLE NRC GUIDELINES EVEN AFTER CUT-OFF DATE

REFERENCEABLE IN OPERATING LICENSE (OL) APPLICATIONS FOR PLANTS WHICH REFERENCED PDA AT CONSTRUCTION PERMIT (CP) STAGE

REFERENCEABLE IN NEW APPLICATIONS FOR CP OR COMBINED CP/FDA UNTIL EXPIRATION

CESSAR DOES REPRESENT
IMPLEMENTATION OF OUR
STANDARDIZATION PHILOSOPHY

"IF IT IS NOT NECESSARY TO
CHANGE - IT IS NECESSARY
NOT TO CHANGE"

STANDARDIZATION DOES NOT REPRESENT
A PERMANENTLY FIXED DESIGN

IT REPRESENTS A DESIGN THAT IS UPDATED AT SPECIFIC INTERVALS

BASE SYSTEMS
WITHIN
CESSAR-F LICENSING SCOPE

- REACTOR
- REACTOR COOLANT SYSTEM
- SAFETY INJECTION SYSTEM
- REACTOR PROTECTION SYSTEM
- ENGINEERED SAFETY FEATURES ACTUATION SYSTEM
- FUEL HANDLING SYSTEM
- SHUTDOWN COOLING SYSTEM
- CHEMICAL AND VOLUME CONTROL SYSTEM
- SUPPLEMENTARY PROTECTION SYSTEM

SUPPORTING SYSTEMS *
WITHIN
CESSAR-F LICENSING SCOPE

- CONTROL SYSTEMS
- MONITORING SYSTEMS
- CONTAINMENT ISOLATION SYSTEM
- NUCLEAR INSTRUMENTATION
- STARTUP TEST GUIDELINES

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*THESE SYSTEMS APPLY ONLY TO THE BASE SYSTEMS FROM THE PREVIOUS SLIDE.

INTERFACE CATEGORIES

A. POWER

B. PROTECTION FROM NATURAL PHENOMENA

C. PROTECTION FROM PIPE FAILURE

D. MISSILES

E. SEPARATION

F. INDEPENDENCE

G. THERMAL LIMITATIONS

H. MONITORING

I. OPERATIONAL/CONTROLS

J. INSPECTION AND TESTING

K. CHEMISTRY/SAMPLING

L. MATERIALS

M. SYSTEM/COMPONENT ARRANGEMENT

N. RADIOLOGICAL WASTE

O. OVERPRESSURE PROTECTION

P. RELATED SERVICE

Q. ENVIRONMENTAL

R. MECHANICAL INTERACTION BETWEEN COMPONENTS

NEW LICENSING GUIDELINES

- LIST OF "ADDITIONAL MATTERS" ISSUED BY REGULATORY REQUIREMENTS REVIEW COMMITTEE (RRRC) IN OCTOBER 1978

- "ADDITIONAL MATTERS" CONSISTED OF REGULATORY GUIDES, STANDARD REVIEW PLANS, AND BRANCH TECHNICAL POSITIONS ISSUED AFTER AUGUST 1974

- CATEGORIZED BY RRRC ACCORDING TO SAFETY SIGNIFICANCE

- "MATTERS" ADDRESSED IN APPENDIX A OF CESSAR-F

- APPENDIX A UPDATED IN 1981

TMI REQUIREMENTS (NUREG-0737)

- ADDRESSED IN APPENDIX B OF CESSAR-F

- LIMITED TO NUREG-0737 ITEMS AFFECTING SYSTEM 80 NSSS

- MAJOR IMPACT ON SYSTEM 80:
  ACCIDENT MONITORING SYSTEM

ENVIRONMENTAL QUALIFICATION (NUREG-0588)

- SYSTEM 80 IS IN CATEGORY I OF NUREG-0588

- ADDRESSED IN C-E TOPICAL REPORT REFERENCED BY CESSAR-F

REGULATORY UPDATE SUMMARY

NRC REQUIREMENTS UP TO AUGUST 1974

+

"ADDITIONAL MATTERS" THROUGH 1981

+

TMI REQUIREMENTS (NUREG-0737)

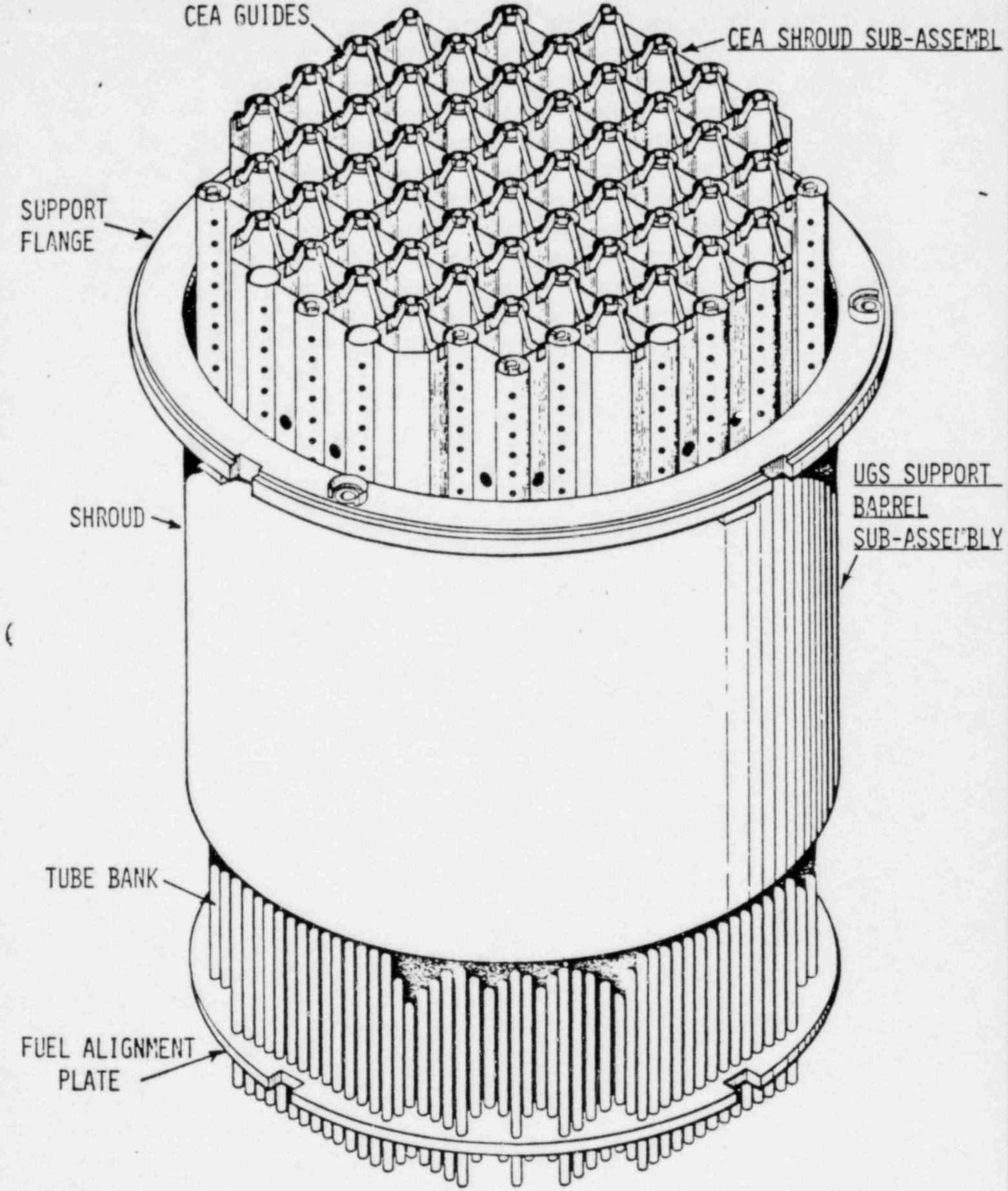
+

ENVIRONMENTAL QUALIFICATION (NUREG-0533)

SYSTEM 80 NSSS WHICH MEETS ALL CURRENT NRC REQUIREMENTS

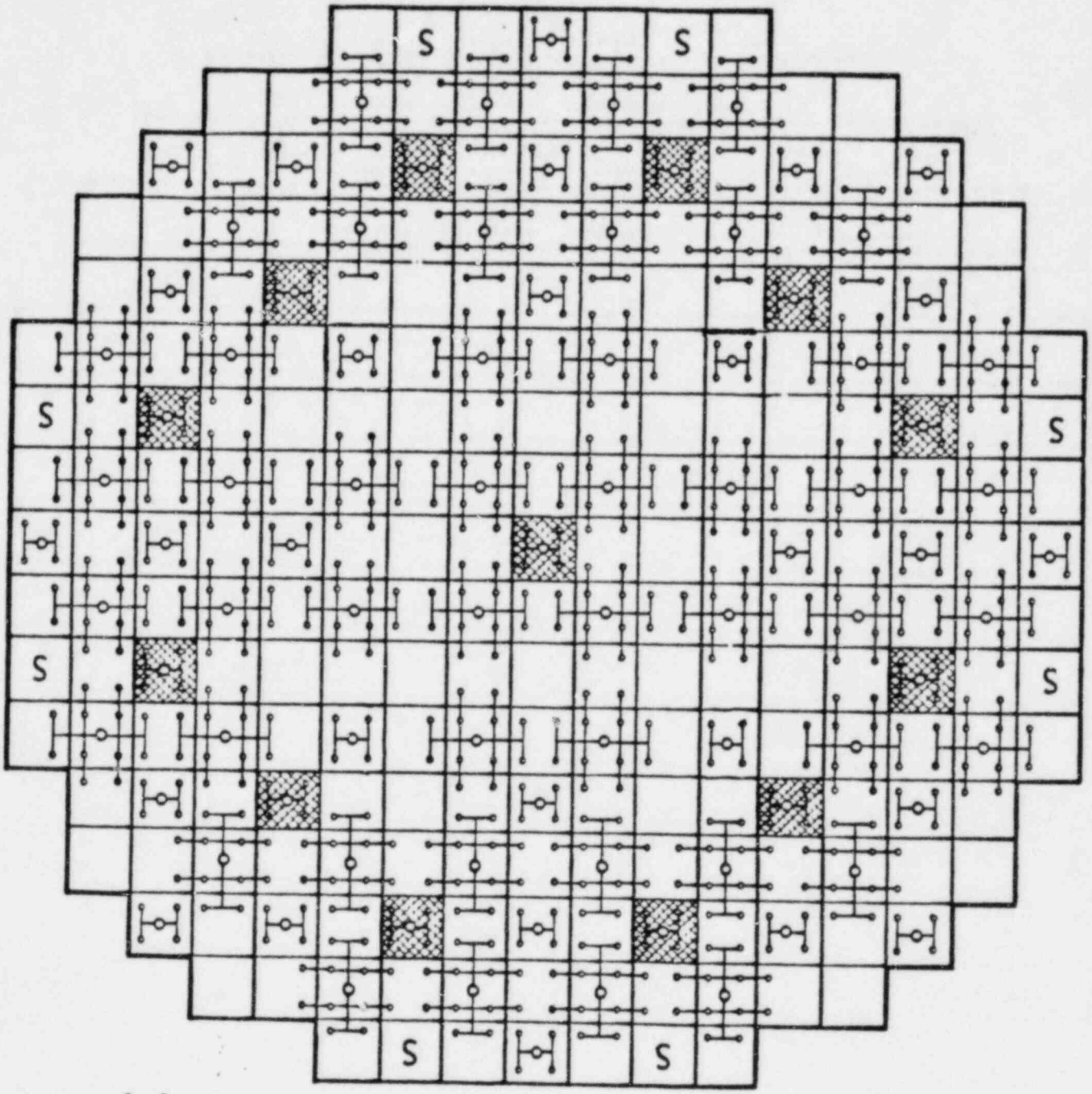
UNIQUE FEATURES OF SYSTEM 80

1. CORE OUTLET FLOW VIA CALANDRIA REGION
2. CONTROL ROD GUIDANCE AND SHROUDING
3. EGGCRATE CORE LOWER SUPPORT STRUCTURE
4. AXIAL-FLOW ECONOMIZER SECTION IN STEAM GENERATOR



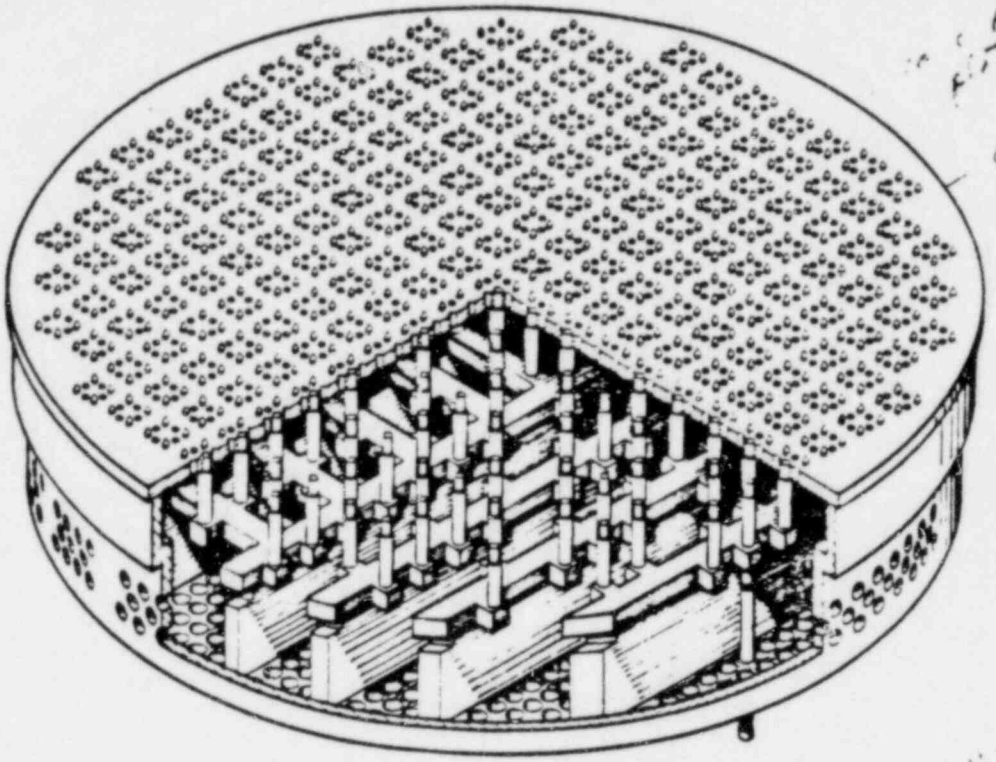
UPPER GUIDE STRUCTURE ASSEMBLY

CONTROL ELEMENT ASSEMBLY LOCATIONS

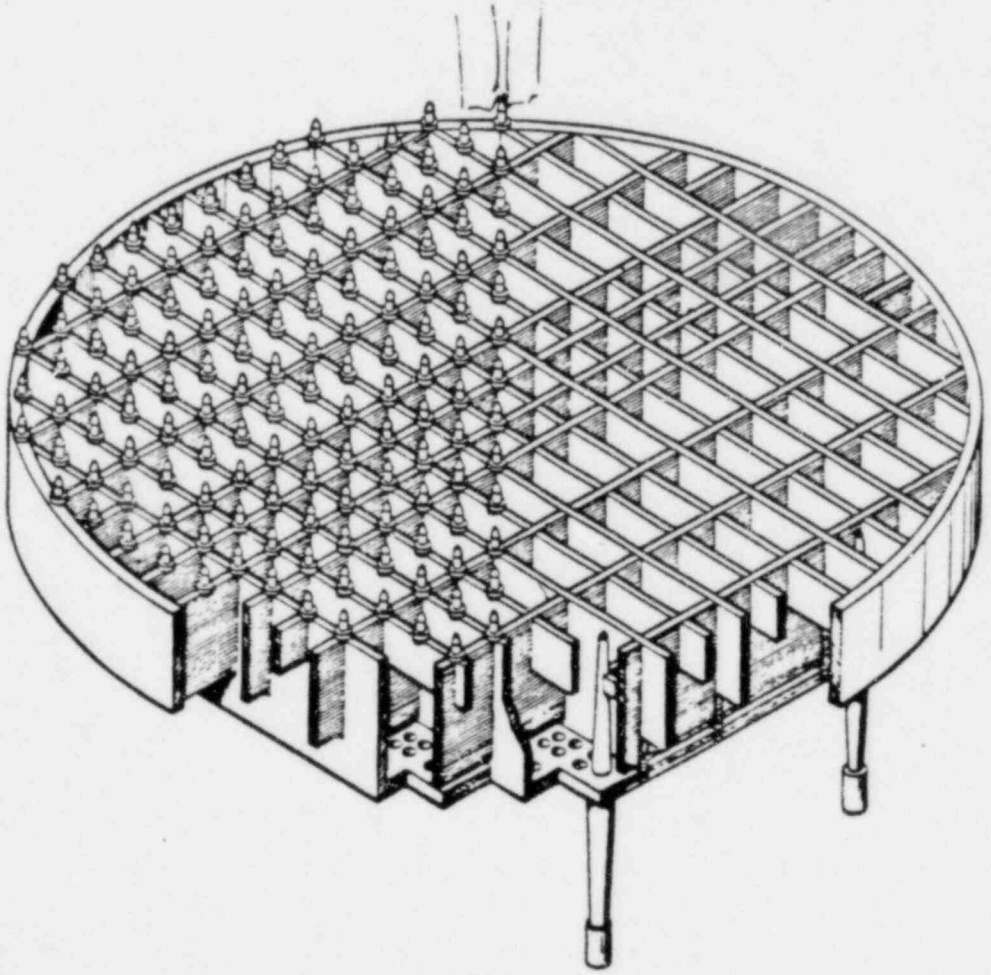


12 ELEMENT FULL LENGTH CEA's	48
4 ELEMENT FULL LENGTH CEA's	28
4 ELEMENT PART LENGTH CEA's	13
TOTAL	89 CEA's
S DENOTES SPARE CEA LOCATIONS	8

SYSTEM 80 LOWER SUPPORT STRUCTURE

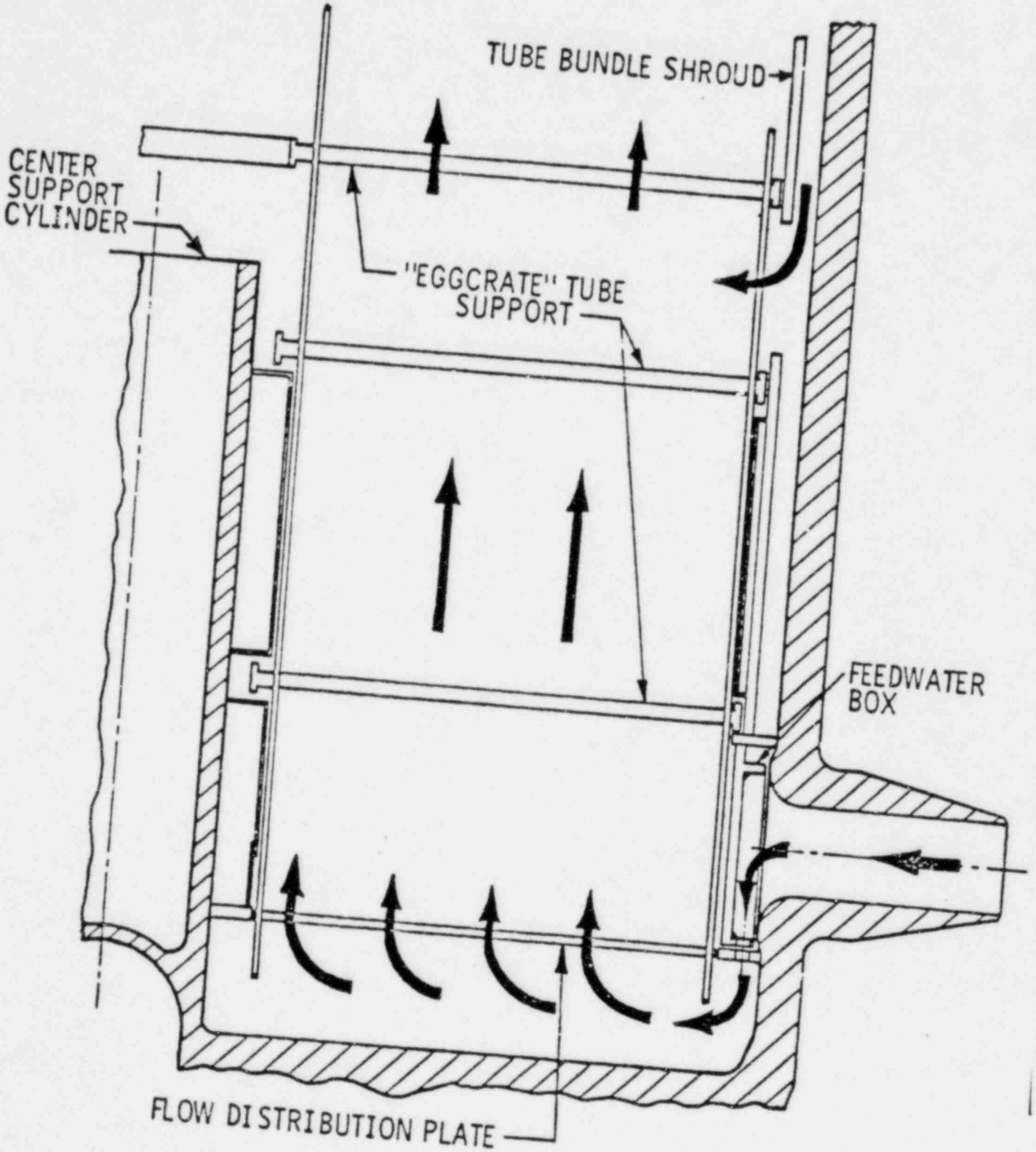


PRELIMINARY DESIGN



FINAL DESIGN

ECONOMIZER ELEVATION VIEW



OTHER FEATURES

1. BOTTOM - MOUNTED IN - CORE INSTRUMENTATION (FIXED PLUS MOVABLE)

2. SUPPLEMENTARY PROTECTIVE SYSTEM

3. DOUBLE OUTLET NOZZLES ON STEAM GENERATORS CONTAINING INTEGRAL FLOW RESTRICTORS

COMPARISON OF PARAMETERS AFFECTING CORE PERFORMANCE BETWEEN SYSTEM 80 AND EARLIER PLANTS

PARAMETER	ANO-2	SONGS 2,3	SYSTEM 80
CORE POWER, MWT	2,815	3,390	3,800
NUMBER OF FUEL BUNDLES	177	217	241
AVERAGE POWER PER FUEL BUNDLE, MWT	15.9	15.6	15.8
CORE INLET TEMPERATURE, ^{o}F	553.5	553.0	565.0
CORE AVERAGE MASS VELOCITY, LBM/HR-FT^2	2.60×10^6	2.61×10^6	2.61×10^6

COMPARISON OF PARAMETERS AFFECTING CORE PERFORMANCE BETWEEN SYSTEM 80 AND EARLIER PLANTS

PARAMETER	ANO-2	SONGS 2, 3	SYSTEM 80
AVERAGE HEAT FLUX, BTU/HR-FT^2	1.89×10^5	1.88×10^5	1.89×10^5
ROD RADIAL PEAKING FACTOR (DESIGN)	1.55	1.55	1.55
AVERAGE LINEAR HEAT RATE, KW/FT	5.52	5.47	5.53
ALLOWABLE PEAKING FACTOR	2.57	2.48	2.48
ALLOWABLE PEAK LINEAR HEAT RATE, KW/FT (AT 102% POWER)	14.5	13.9	14.0

ALTERNATE DHR CAPABILITY

SECONDARY FEED AND BLEED

- STEAM GENERATOR DEPRESSURIZATION WITH ATMOSPHERIC DUMP VALVES.

- FEEDWATER MAKEUP USING LOW HEAD PUMP (E.G. FIRE PUMP).

SECONDARY FEED AND BLEED FEATURES:

1. RCPB MAINTAINED INTACT

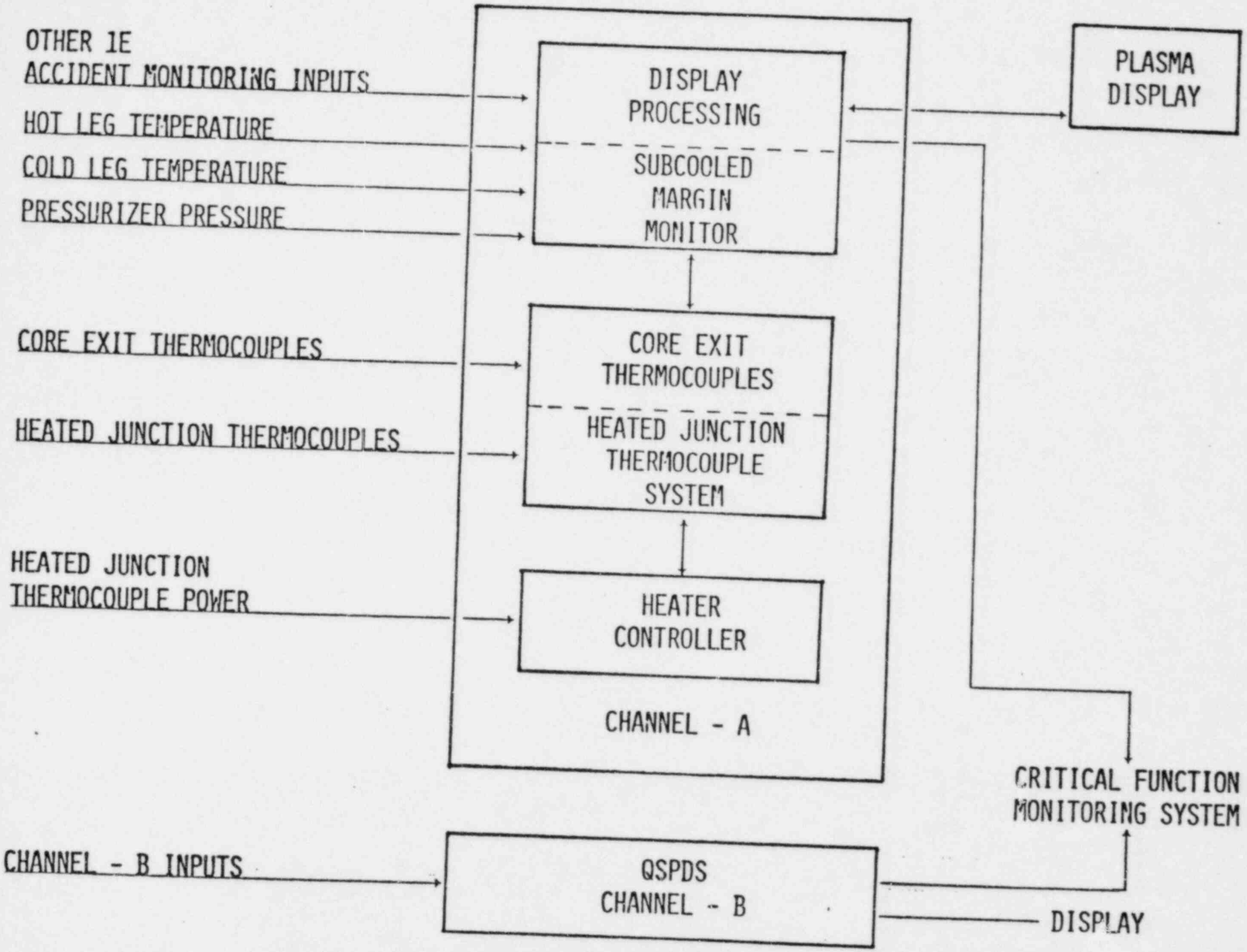
2. CONSISTENT WITH NORMAL DHR PROCEEDURES

3. DOES NOT REQUIRE PRIMARY DEPRESSURIZATION.

4. TIME FOR OPERATOR ACTION IS AVAILABLE.

5. EQUIPMENT IS ACCESSIBLE.

QUALIFIED SAFETY PARAMETER DISPLAY SYSTEM (QSPDS) BLOCK DIAGRAM



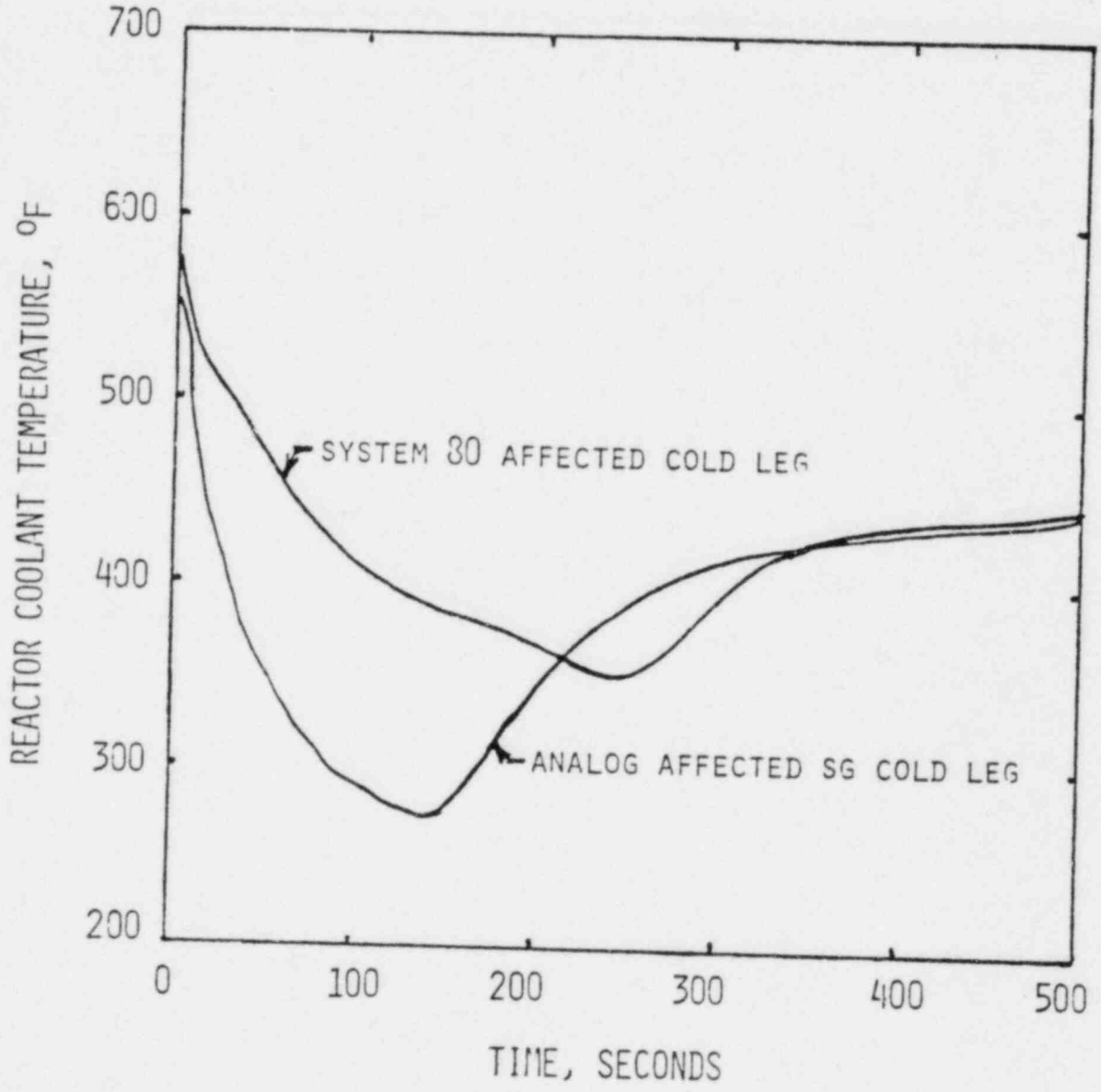
NSSS DIFFERENCES

IMPORTANT TO SAFETY

PARAMETER	TYPICAL ANALOG PLANT	SYSTEM 80
POWER, MWT	2560	3800
F_R	≤ 1.7	≤ 1.63
ASI	$\pm .3$	$\pm .3$
CORE FLOW, LBM/HR	139×10^6	157×10^6
% RANGE	100-110	95-116
T_{INLET}, °F	540-551	560-570
RCS PRESSURE, PSIA	2150-2350	1785-2400

NSSS DIFFERENCES IMPORTANT TO SAFETY (CONTINUED)

PARAMETER	TYPICAL ANALOG PLANT	SYSTEM 80
MTC, 10^{-4} $\Delta\rho$/F	-.12 → -2.9	0. → -3.5
CEA WORTH, %$\Delta\rho$ AT FP	-5.7	-8.8
RV CLOSURE HEAD VOLUME, FT^3	1300	2000
HPSI SHUTOFF HEAD, PSIA	1300	1750
SIT PRESSURE, PSIA	600	600
STEAM GENERATOR NOZZLE FLOW RESTRICTORS	NO	YES
PRESSURIZER RELIEF CAPACITY, 10^6 LB/HR	0.6	2.0
SURGE LINE EFFECTIVE LENGTH, FT	330	441



FULL POWER LARGE STEAM LINE BREAK
WITH CONCURRENT LOSS OF OFFSITE POWER
REACTOR COOLANT TEMPERATURE vs TIME