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Docket No. 50-309

FACILITY: Maine Yankee Atomic Power Plant

LICENSEE: Maine Yankee Atomic Power Company

SUBJECT: MEETING WITH MAINE YANKEE ATOMIC POWER COMPANY ON THERMAL SHIELD POSITION PINS.

A meeting was held with representatives of the Maine Yankee Atomic Power Company (MYAPC) and Combustion Engineering (CE) to discuss dislodged position pins on Maine Yankee's Thermal Shield. Attendees at the meeting are summarized in Enclosure I.

A presentation was made by the MYAPC and CE representatives concerning the dislodged position pins. Details of presentation are given in enclosure II. Key points made were as follows:

- The remaining pins showed no sign of failure. The thermal shield support lugs were also OK. Thus, there were no signs of possible further failure.
- The failure of the 3 pins could be explained. The major loose parts had been recovered. There was no safety problem associated with the failure.
- Maine Yankee felt comfortable with reinstalling the core barrel-thermal shield "as is," but with an increased surveillance program.

In subsequent discussion, additional questions were asked by the NRC staff. All questions were answered.

MYAPC agreed to submit a written report summarizing the material presented to NRC at this meeting.

Original signed by:

Ken Heitner, Project Manager
 Operating Reactors Branch #3
 Division of Licensing

Attachment:
As stated

cc: See next page

8211100493 821102
 PDR ADOCK 05000309
 P PDR

OFFICE	DL:ORB#2	DL:ORB#3	DL:ORB#3			
SURNAME	PKreutzer	KHeitner:dd	RAClark			
DATE	11/1/82	11/2/82	11/2/82			

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ATTENDANCE AT
MEETING WITH MAINE YANKEE ON
THERMAL SHIELD POSITION PINS
OCTOBER 27, 1982

<u>NAME</u>	<u>Organization</u>
K. Heitner	NRC/NRR/ORB#3
C. Molnar	C-E
R. Jacques	CE-PWR
F.T. Grubrich	CE- Engineering
S. Hou	NRC/NRR/MEB
R. A. Clark	NRC/NRR/ORB#3
John Garrity	MY- Licensing
John Randazza	MY-VP, Chief Op. Officer
A. J. Cayia	MY-Licensing
R.E. White	Yankee Atomic-Mech. Eng.
John F. Mullolly	Combustion Eng- Mech. Des.
F. Longo	C-E Mech. Des.
D. Sellers	NRR MTEB
G. C. Lainas	NRC/NRR/ADOR

PRESENTATION OUTLINE

10-27-82

- SUMMARY AND CONCLUSIONS

- DESIGN DESCRIPTION

- INSPECTION RESULTS

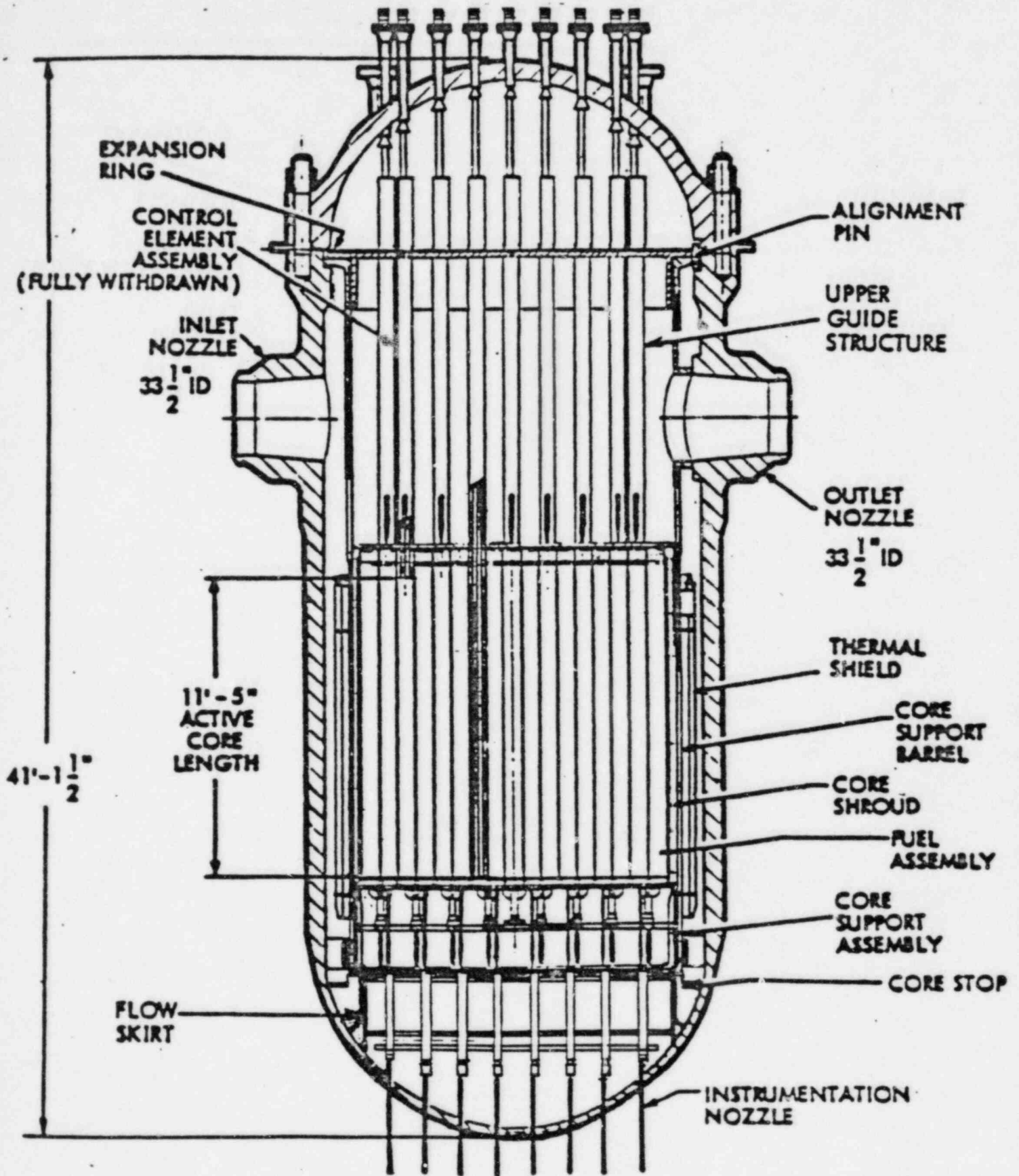
- FAILURE MECHANISMS EXAMINED
AND MOST PROBABLE CAUSE

- ACTION PLAN

- BASIS FOR ACTION PLAN

SUMMARY AND CONCLUSIONS

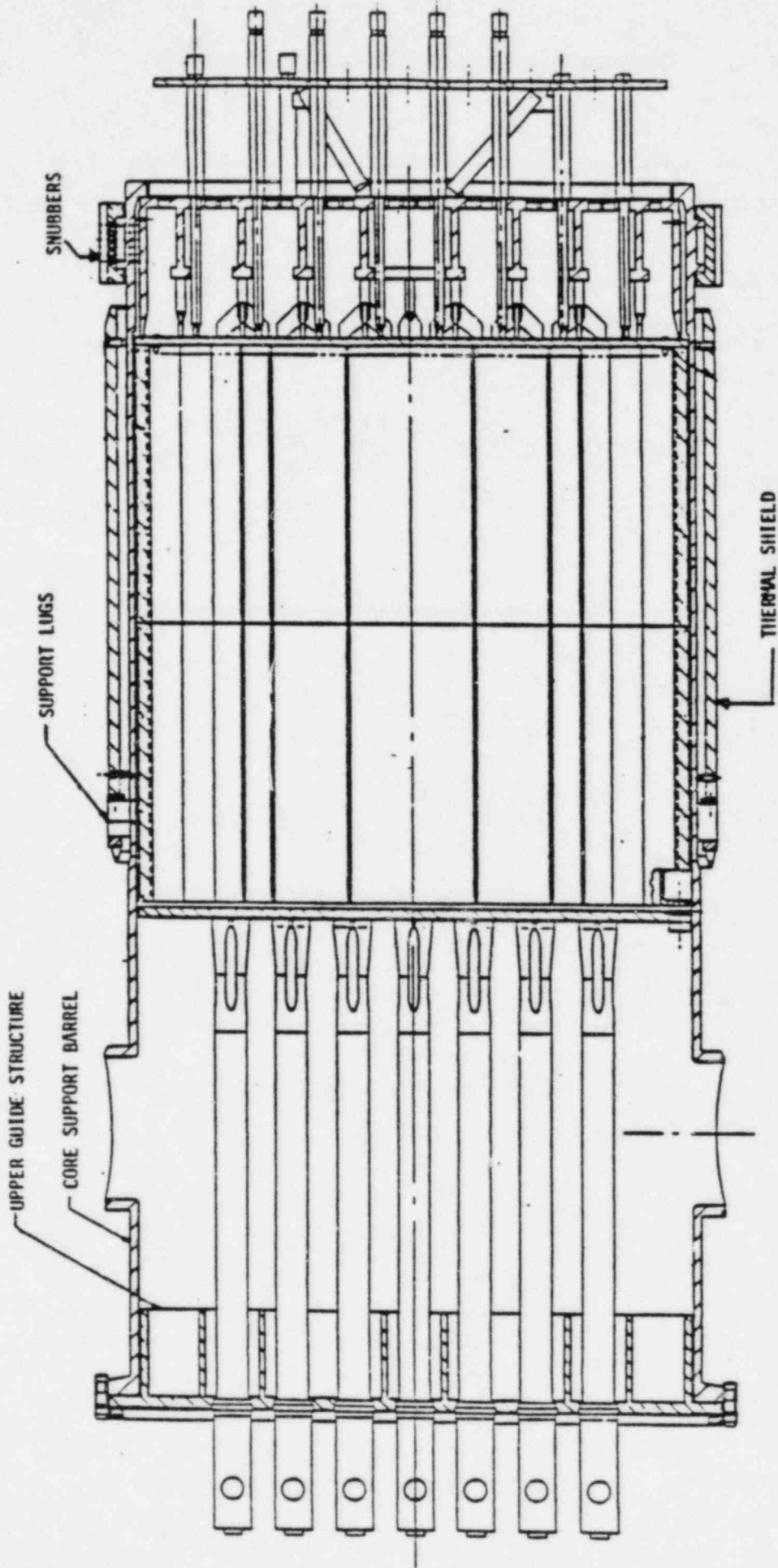
- INSPECTIONS INDICATE NORMAL LEVEL OF REACTOR INTERNALS VIBRATION.
- ANALYSIS SHOWS NO OVERSTRESSED CONDITION RESULTING FROM CONTINUED OPERATION THROUGH THE NEXT FUEL CYCLE.
- NOT A SAFETY ISSUE.

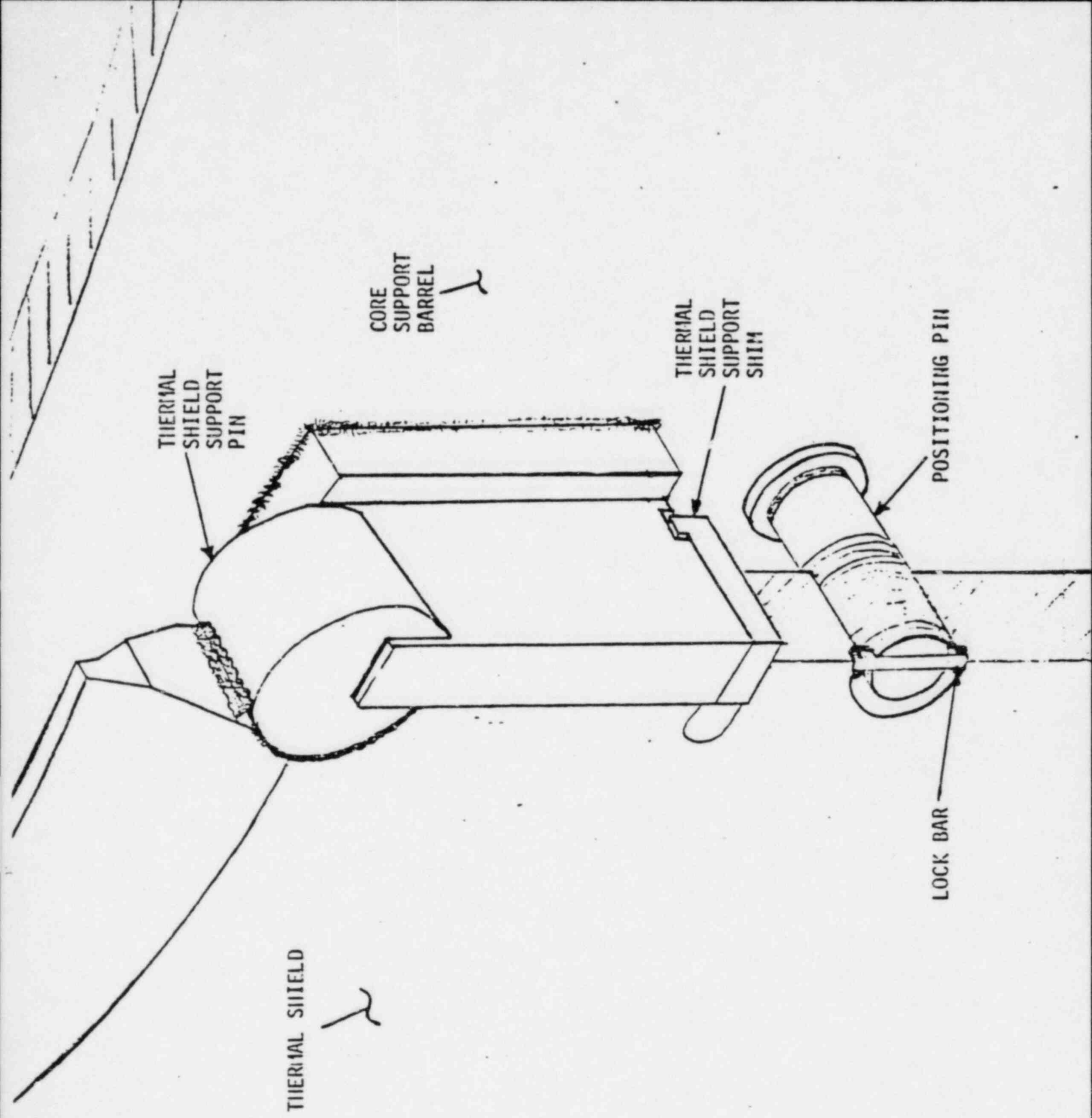


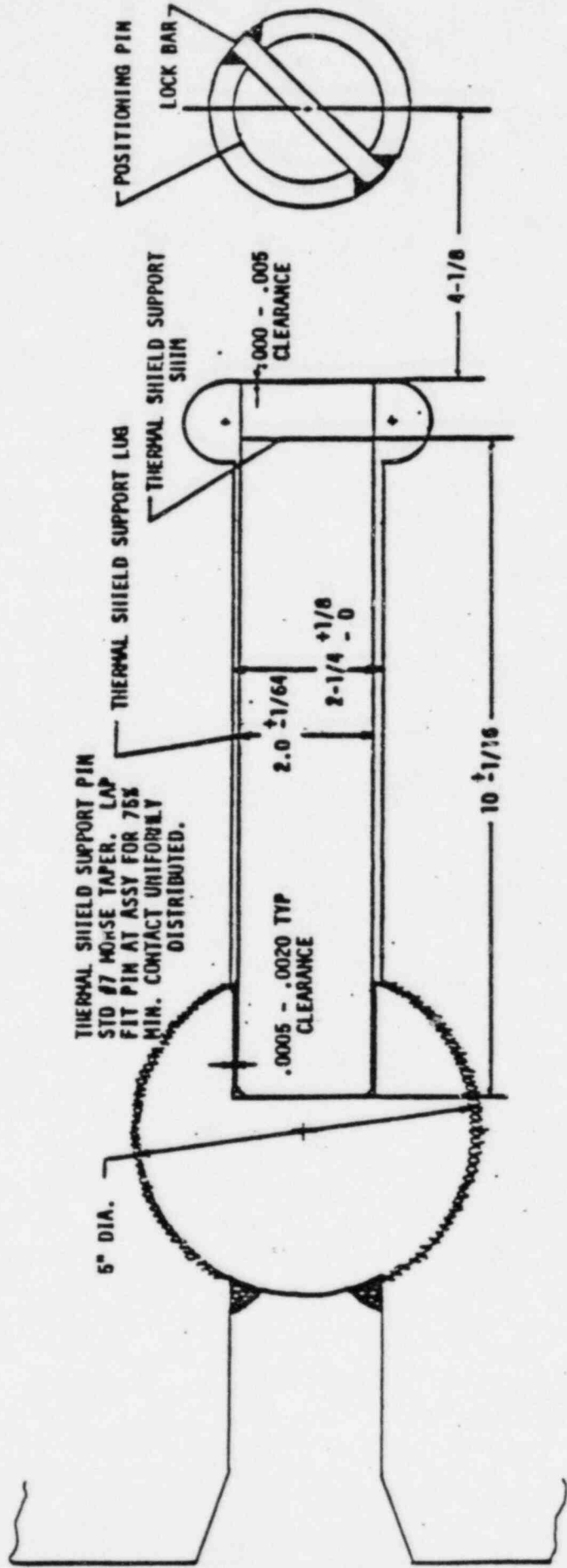
Reactor Vertical Arrangement

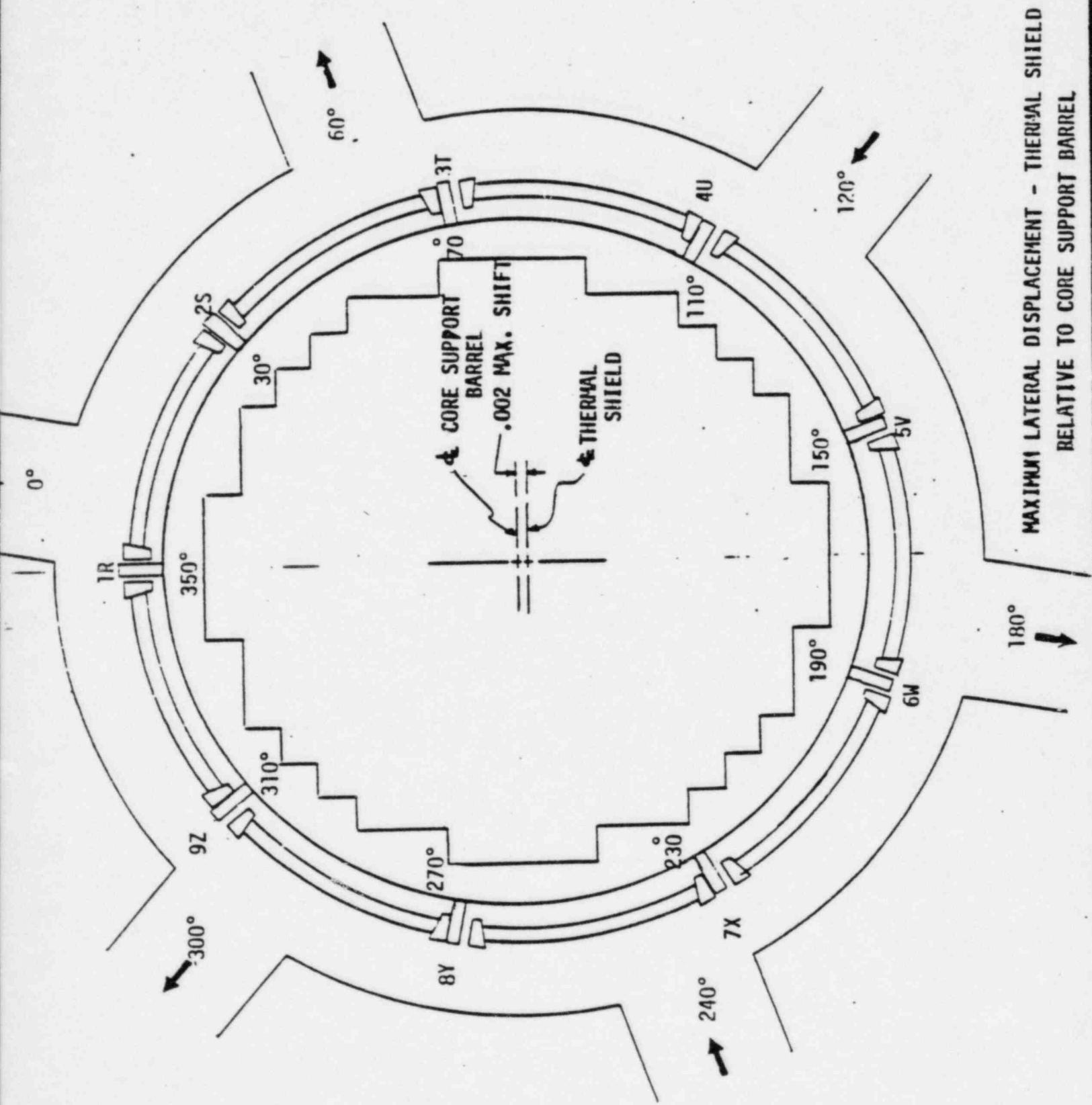
Figure
1

REACTOR VESSEL INTERNALS



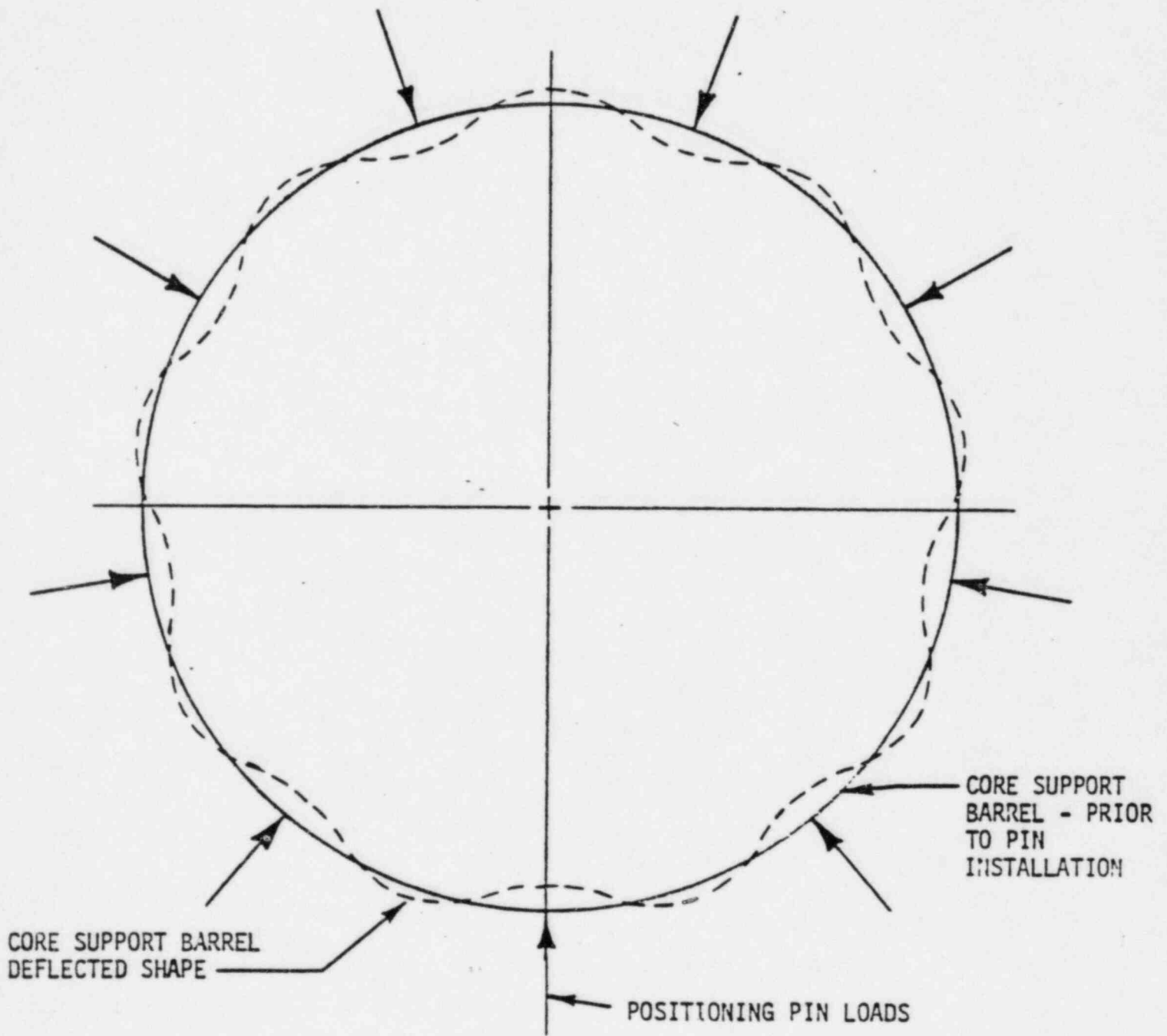




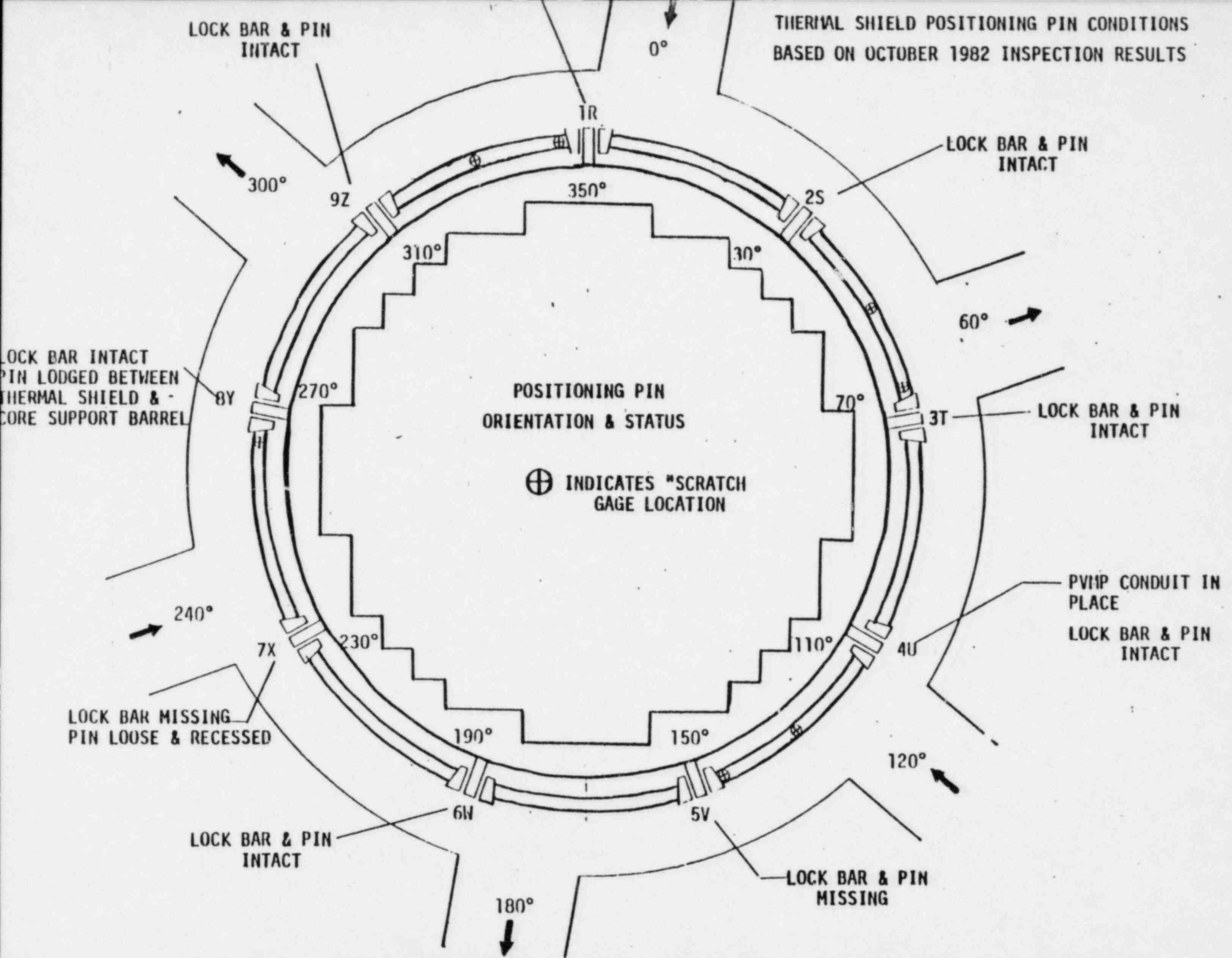


MAXIMUM LATERAL DISPLACEMENT - THERMAL SHIELD
 RELATIVE TO CORE SUPPORT BARREL

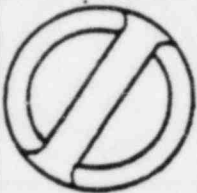
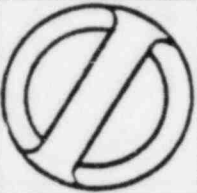
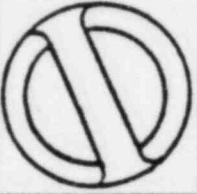

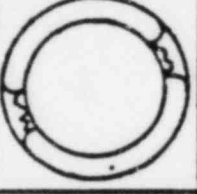
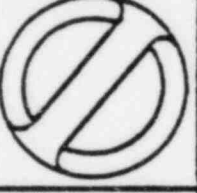
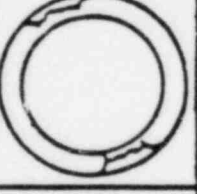


CORE SUPPORT BARREL DEFLECTED SHAPE FOLLOWING
POSITIONING PIN INSTALLATION



THIERMAL SHIELD POSITIONING PIN CONDITIONS
BASED ON OCTOBER 1982 INSPECTION RESULTS

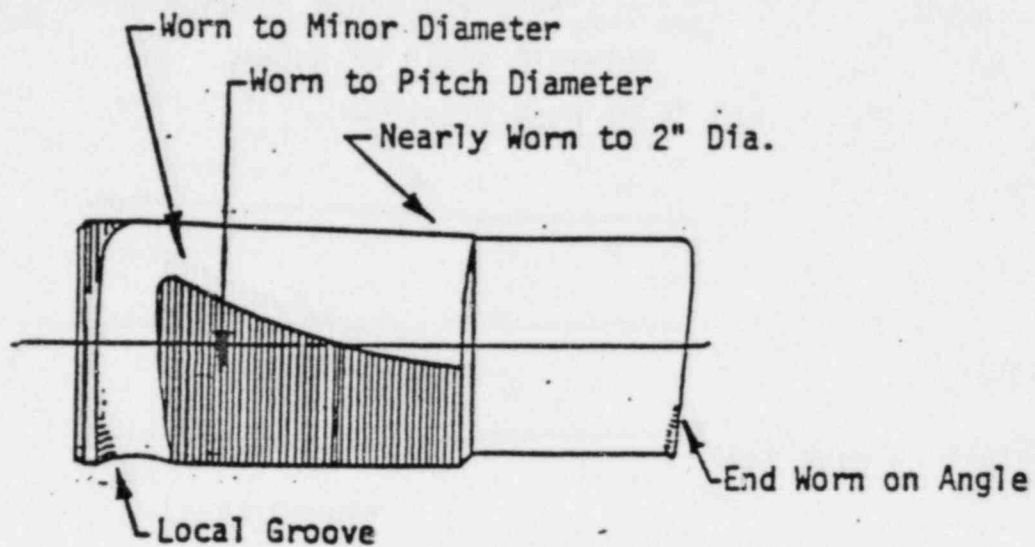


YANKEE THERMAL SHIELD PINS AND LOCKBARS.

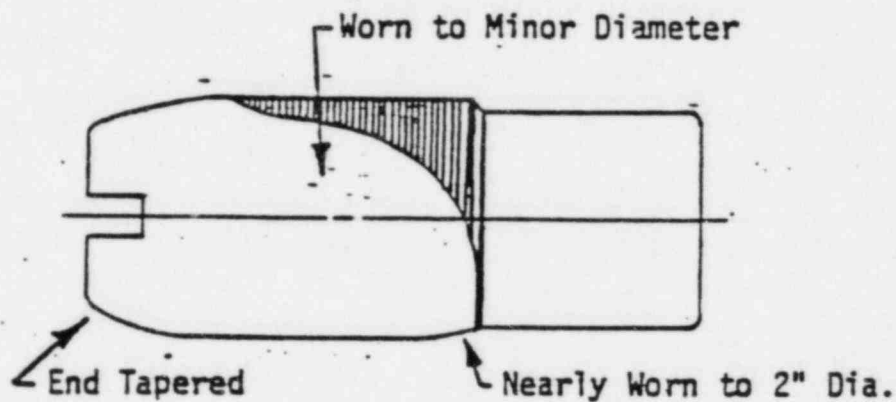
	LOCATION*	COMMENTS
	350° 1 R	PIN AND LOCKBAR GOOD. SCRATCH GAGE HOLE TO LEFT.
	30° 2 S	PIN AND LOCKBAR GOOD.
	70° 3 T	PIN AND LOCKBAR GOOD.
	110° 4 U	PIN AND LOCKBAR GOOD.
	150° 5 V	PIN AND LOCKBAR MISSING. PIN AT THE BOTTOM OF REACTOR VESSEL OUTSIDE FLOW SKIRT.
	190° 6 W	PIN AND LOCKBAR GOOD.
	230° 7 X	PIN MISSING. LOCKBAR DETACHED. PIN CAUGHT IN HOLE, PROTRUDING INTO T.S. /C.S.B. ANNULUS.
	270° 8 Y	PIN MISSING. LOCKBAR IN PLACE. PIN LODGED BETWEEN THERMAL SHIELD AND CORE SUPPORT BARREL.
	310° 9 Z	PIN AND LOCKBAR GOOD. SCRATCH GAGE HOLE TO LEFT.

* NUMBER DEFINES SUPPORT LUG. LETTER DEFINES PRELOADED PIN.

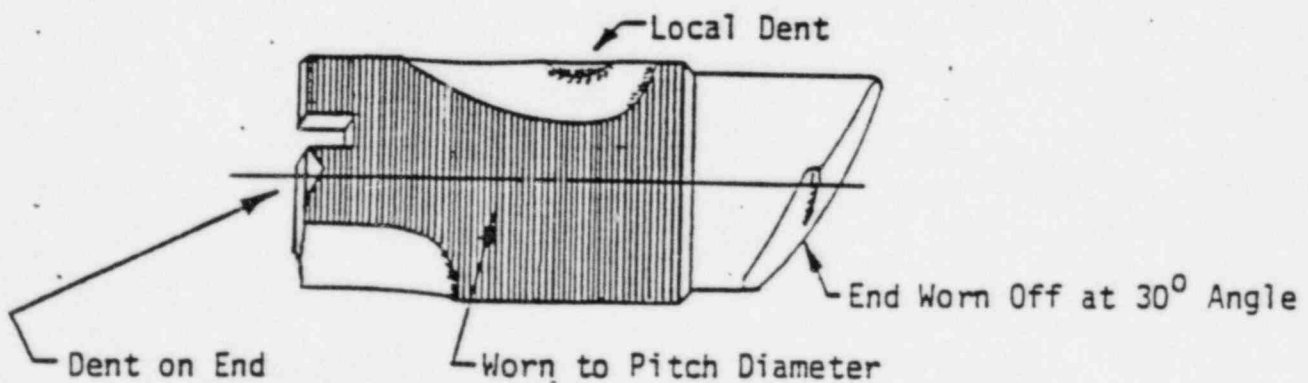
INSPECTED CONDITION OF LOOSE POSITIONING PINS



PIN 5 LOCATED AT 150° , RETRIEVED FROM BOTTOM OF REACTOR VESSEL



PIN 7 LOCATED AT 230° , PROTRUDES FROM ITS INSTALLATION HOLE IN THE THERMAL SHIELD INTO THE THERMAL SHIELD/CORE SUPPORT BARREL ANNULUS



PIN 8 LOCATED AT 270° , LODGED HORIZONTALLY IN THERMAL SHIELD/CORE SUPPORT BARREL ANNULUS BELOW ITS INSTALLATION HOLE

POSSIBLE FAILURE MECHANISMS EXAMINED

- LOSS OF PRELOAD ON POSITIONING PINS
- FLOW INDUCED VIBRATION
- POSITIONING PIN AND SUPPORT LUG LOADS AND STRESSES
- RADIATION INDUCED EFFECTS
- THERMAL EXPANSION - THERMAL SHIELD - PIN - CORE BARREL
- MATERIAL DEFECTS
- CORROSION
- WEAR
- INSTALLATION

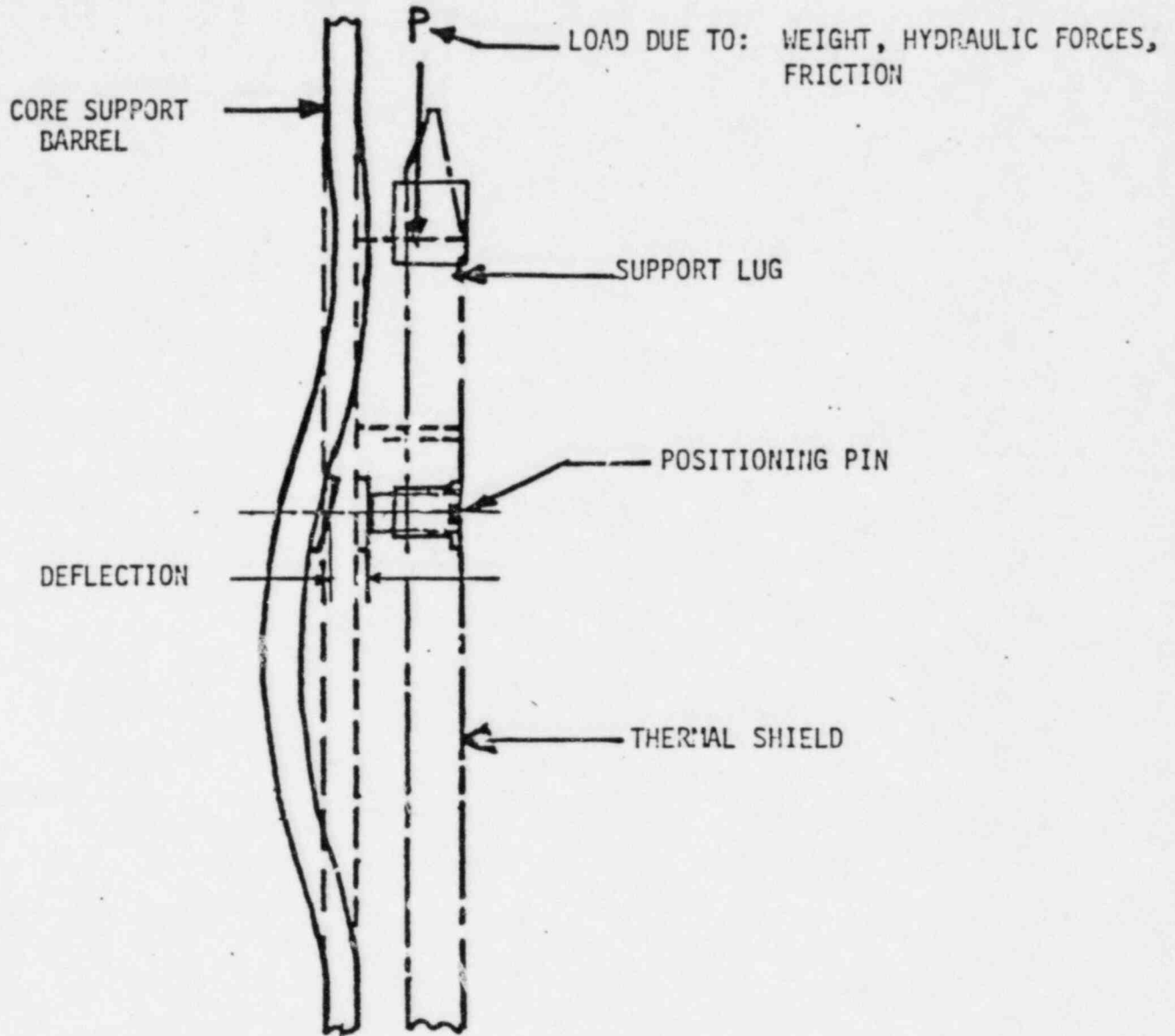
MOST PROBABLE FAILURE SCENARIO

LOSS OF PRELOAD ON POSITIONING PINS

CAUSED BY THE EFFECTS OF:

- EXTERNAL PRESSURE ON CORE SUPPORT BARREL
- EXTERNAL DYNAMIC PRESSURE ON CORE SUPPORT BARREL
- INTERNAL PRESSURE FORCE ON THERMAL SHIELD
- DOWNWARD HYDRAULIC LOAD ON SUPPORT LUG
- LOSS DUE TO INSTALLATION TECHNIQUE
- VARIATION IN SUPPORT LUG VERTICAL LOAD
- POSITION PIN TORQUE DUE TO SPECIFICATION TOLERANCE AND VARIATION IN FRICTION
- CONTRIBUTION TO LOSS OF PRELOAD FROM STRESS RELAXATION
- ▲ RESULTING IN POSITION PIN PRELOAD BECOMING SUFFICIENTLY LOW TO ALLOW BUFFETING BY HYDRAULIC FORCES

POSTULATED SHELL DEFORMATION DUE TO VERTICAL LOAD ON LUG



ACTION PLAN

1. RECOMMEND PLANT OPERATION THROUGH NEXT FUEL CYCLE WITH THREE PINS RETRIEVED BUT NOT REPLACED.
2. DURING NEXT CYCLE PROVIDE CONFIRMATORY EFFORT TO CONTINUE OPERATION BEYOND NEXT FUEL CYCLE WITH POSITIONING PINS NOT REPLACED.
3. CONTINGENCY PLANNING: PREPARE A FIX TO REPLACE PINS AND/OR REMOVE REMAINING UPPER POSITIONING PINS.

BASIS FOR ACTION PLAN

1. INSPECTIONS CONDUCTED AT THE CURRENT OUTAGE, INSPECTIONS IN 1974 AND AT PRE-CRITICAL VIBRATION TESTING SHOWED NO EVIDENCE OF GROSS VIBRATION OF THE REACTOR INTERNALS.
2. THERMAL SHIELD SUPPORT LUGS SHOW NO EVIDENCE OF WEAR AT ALL NINE LOCATIONS.
3. REMAINING SIX UPPER PINS AND LOCK BARS ARE INTACT, SHOW NO VISIBLE SIGNS OF LOOSENESS OR WEAR.
4. ALL SEVENTEEN LOWER PINS SHOW NO EVIDENCE OF A PROBLEM.
5. THE THERMAL SHIELD POSITIONING PINS WERE MORE THAN LIKELY LOOSE FOR SOME PERIOD OF TIME BASED ON WEAR OF PINS AND THEIR RESPECTIVE HOLES.
6. ANALYSIS RESULTS INDICATE MISSING PINS DO NOT MEASURABLY CHANGE FREQUENCY OF SUPPORT.