Enclosure 1

FURNACE SENSITIZED STAINLESS STEEL IN PRESSURE RETAINING AND STRUCTURAL PORTIONS TMI Nos. 1 and 2 PRIMARY SYSTEM

As a result of problems at other nuclear stations, Met-Ed took action in the early phases of the TMI Nos. 1 and 2 Projects to eliminate the use of all furnace sensitized stainless steel from the pressure retaining structural portions of the primary coolant systems. As a result, furnace sensitized stainless steel was elimimated from the pressure retaining structural portions of the reactor vessel, pressurizer, steam generator, reactor coolant piping, and core flooding tanks. The only furnace sensitized stainless steel used in these components is in the cladding which is not a pressure retaining structural part.

The specific material and fabrication sequences being used on the Three Mile Island Units Nos. 1 and 2 to eliminate furnace sensitized stainless steel can be summarized as follows:

1. Reactor Vessel (See Figures 1, 1A, and 1B)

   a. The in-core instrument penetrations in the lower head are Inconel.

   b. The closure head control rod drive penetrations are partially Inconel and partially stainless steel, but are installed after final stress relief of the head.

   c. The primary coolant nozzles do not require stainless steel or Inconel safe-ends since the piping is low alloy carbon steel.

   d. The welds for penetrations of the core flooding nozzles are buttered with Inconel. The stainless steel safe-ends and thermal sleeves are installed after final stress relief of the vessel.

e. The core stop lugs are Inconel.

f. The flow vanes are stainless steel and are installed after final stress relief of the vessel.

2. Steam Generators (See Figure 2)

a. The primary coolant nozzles do not require stainless steel or Inconel safe-ends since the piping is low alloy carbon steel.

b. The tubing is Inconel

c. The drain nozzle is Inconel

3. Pressurizer (See Figure 3)

a. Of the eight nozzles less than four inches in diameter, seven will have Inconel safe-ends and the vent nozzle will be entirely Inconel.

b. The four inch diameter spray and ten inch diameter surge nozzles will be buttered with Inconel. The stainless steel safe-ends and ther thermal sleeves will be installed after final stress relief.

c. The stainless steel internals (surge deflection device and pressurizer heaters) will be installed after final stress relief.

4. Primary Coolant Piping (See Figures 4A, 4B, and 4C)

a. Nozzles less than four inches in diameter will be Inconel or have Inconel safe-ends except that the weld preparation of the high pressure injection nozzles will be buttered with Inconel and the stainless steel safe-ends and thermal sleeves will be installed after final stress relief.

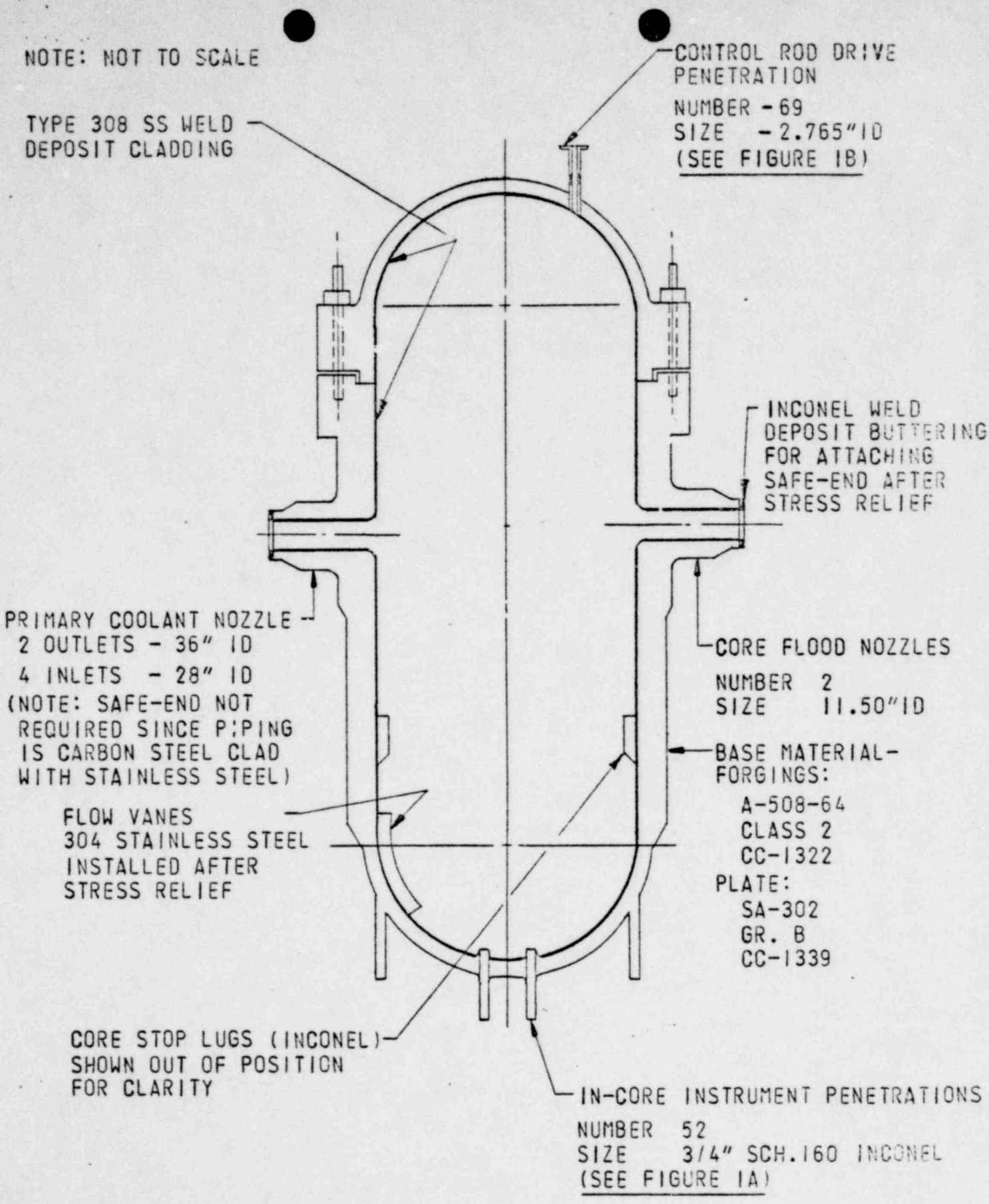
b. The 12 inch decay heat and 10 inch surge nozzles will be buttered with Inconel. The attached stainless steel piping will be welded directly to the Inconel butter layer in the field.

c. The reactor coolant pump inlet and discharge safe-ends will be stainless steel which will be welded to an Inconel butter layer after final stress relief.

5. Core Flooding Tanks (Figures 5A and 5B)

a. On TMI No. 1 nozzles less than four inches in diameter will be carbon steel with weld deposited stainless steel cladding and with an Inconel safe-end. On TMI No. 2 such nozzles will be entirely Inconel.

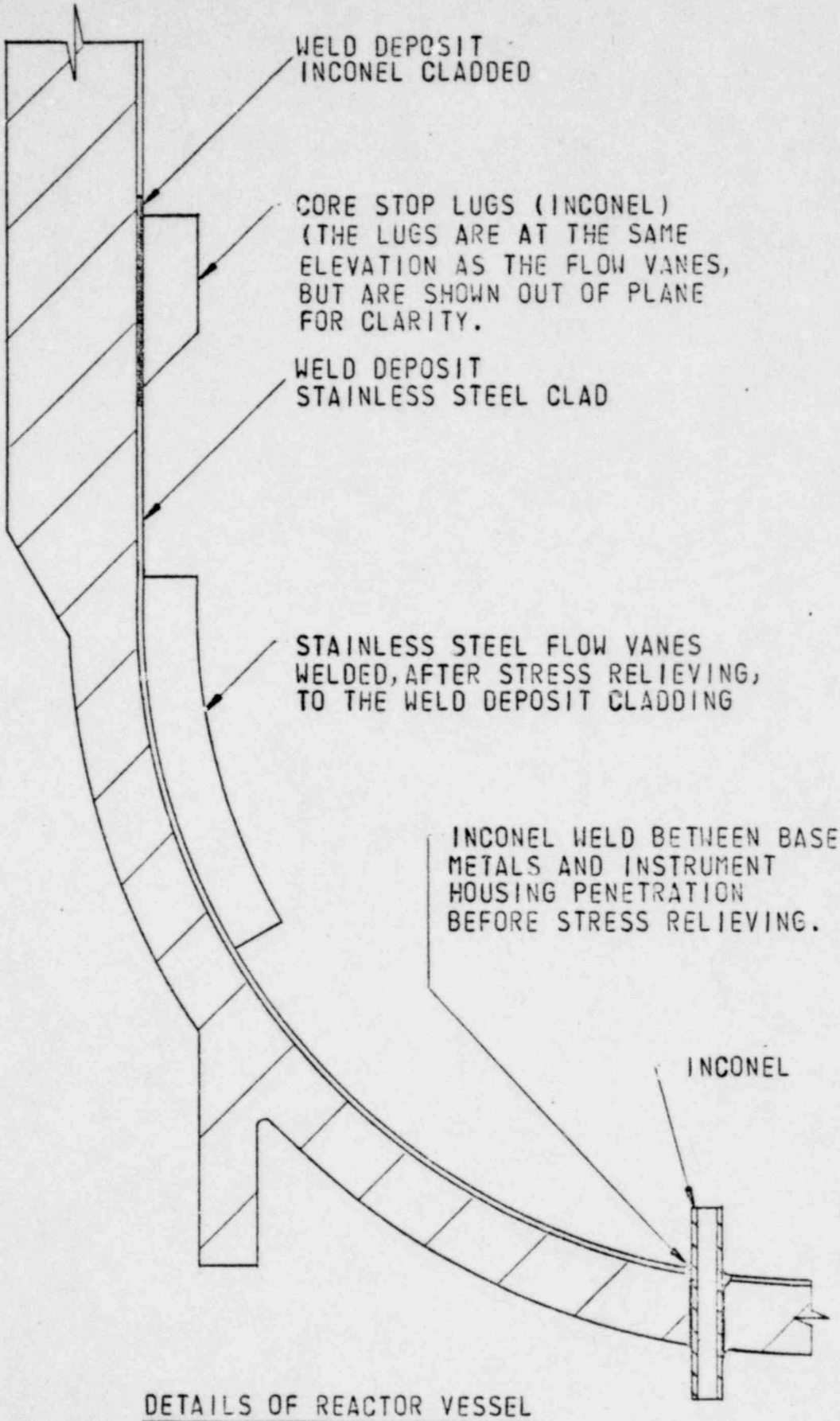
b. The 14-inch core flooding nozzles will be buttered with Inconel. A stainless steel safe-end will be attached to the Inconel butter layer after final stress relief.



METROPOLITAN EDISON REACTOR VESSELS TMI 1 & 2

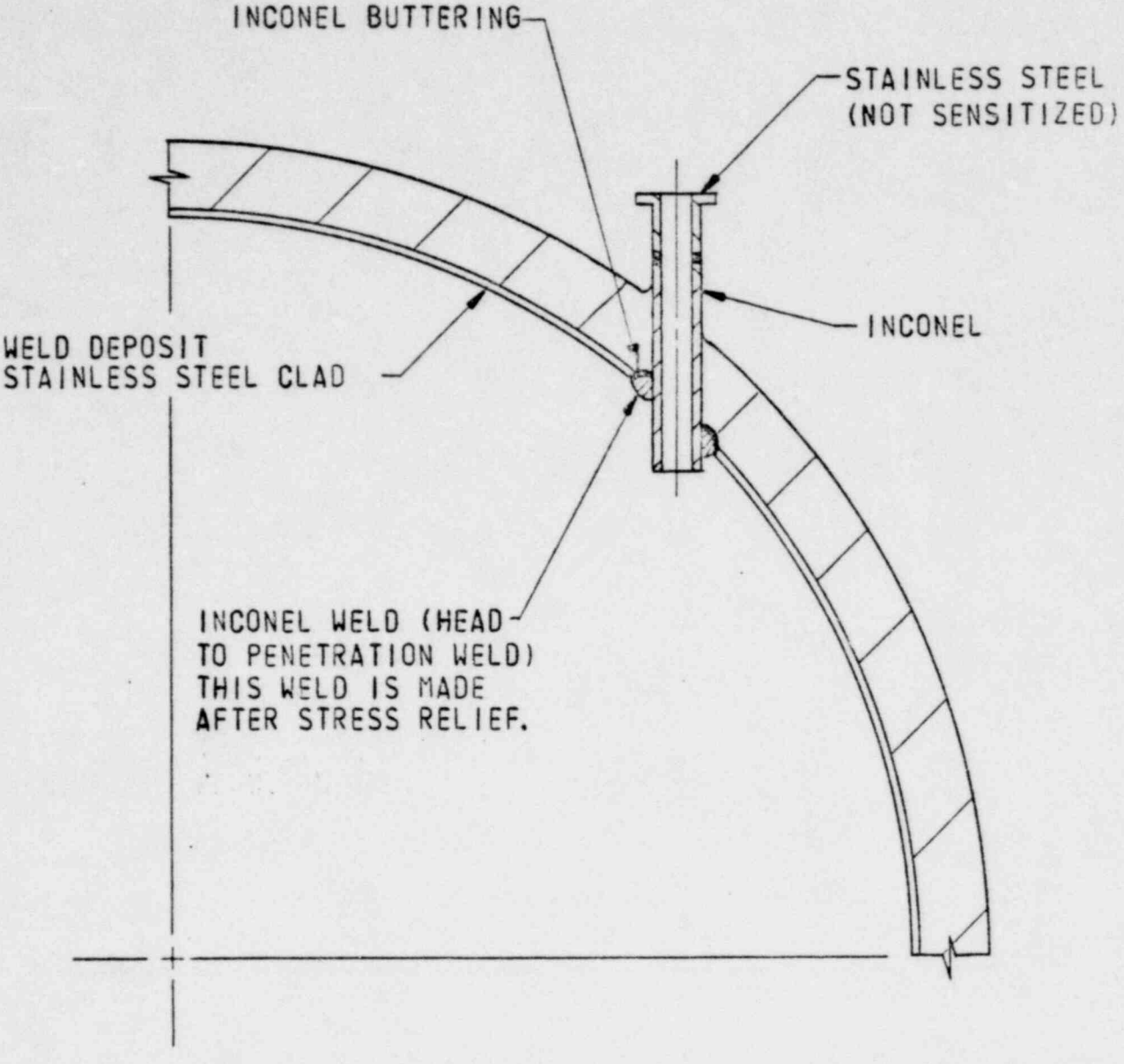
FIGURE 1

NOTE: THESE ARE SCHEMATIC WELD JOINTS TO SHOW BASIC PRINCIPLES USED TO PREVENT SENSITIZATION OF STRUCTURAL WELDS. THESE ARE NOT EXACT WELD JOINT CONFIGURATIONS.



DETAILS OF REACTOR VESSEL

FIGURE 1A



NOTE: THESE ARE SCHEMATIC WELD JOINTS TO SHOW BASIC PRINCIPLES USED TO PREVENT SENSITIZATION OF STRUCTURAL WELDS. THESE ARE NOT EXACT WELD JOINT CONFIGURATIONS.

REACTOR VESSEL HEAD CONTROL ROD DRIVE PENETRATION

FIGURE 1B

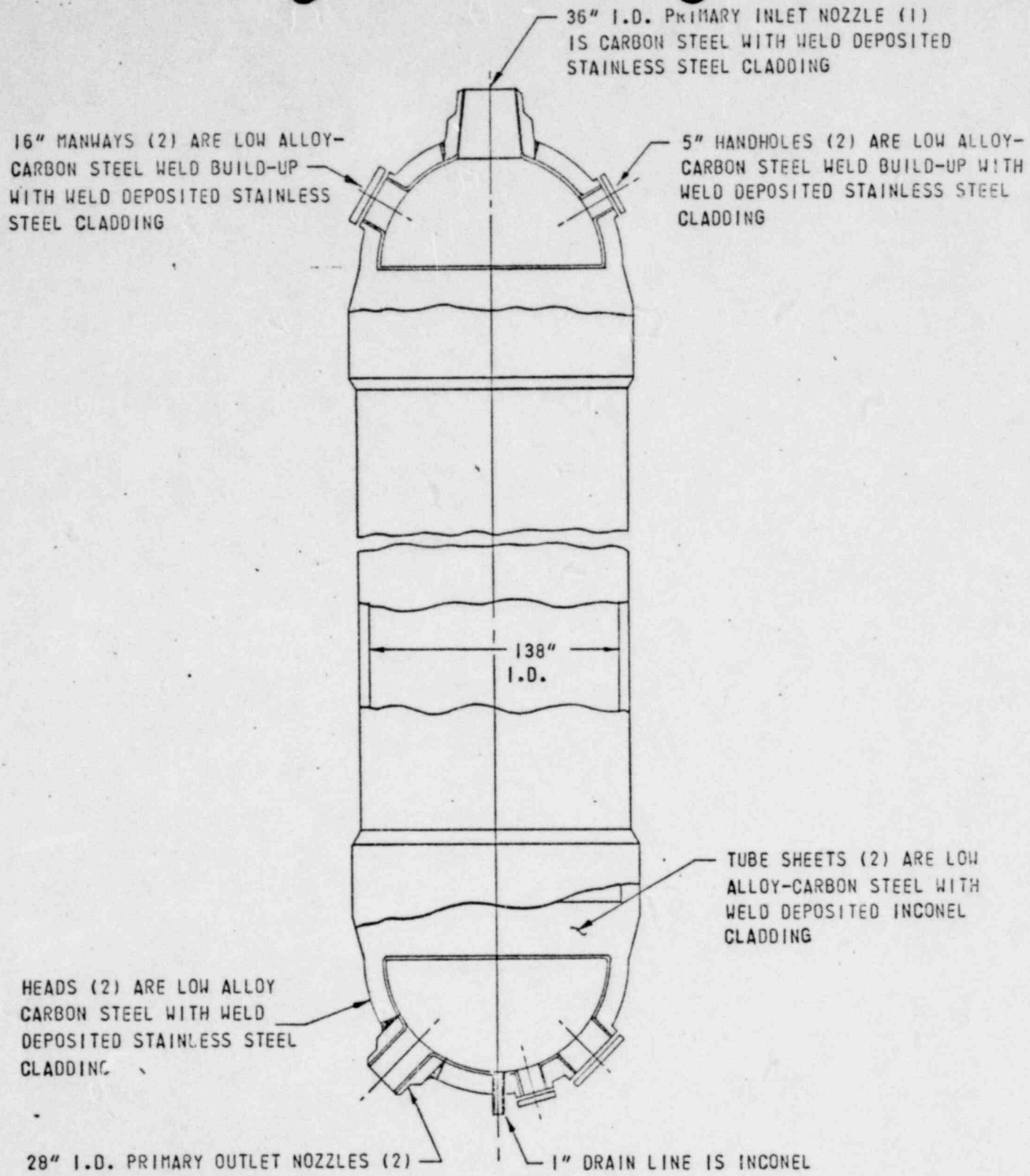


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FIGURE 2

SCHEMATIC OF MEROPOLITAN-EDISON'S TMI#1 & TMI#2 STEAM GENERATOR

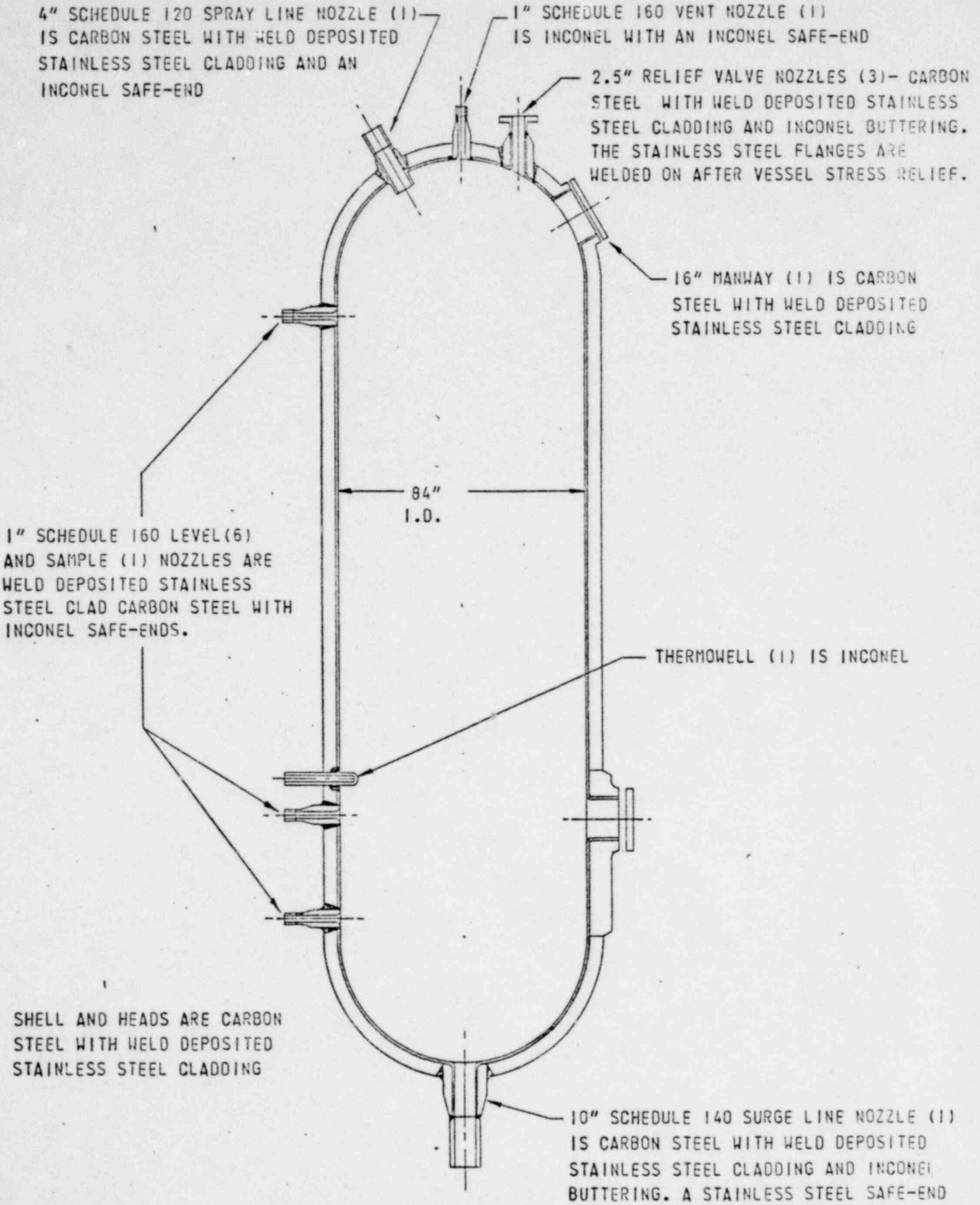
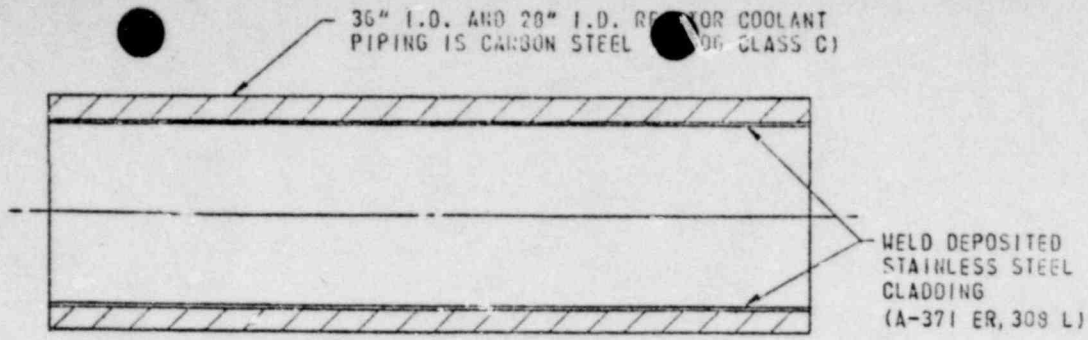
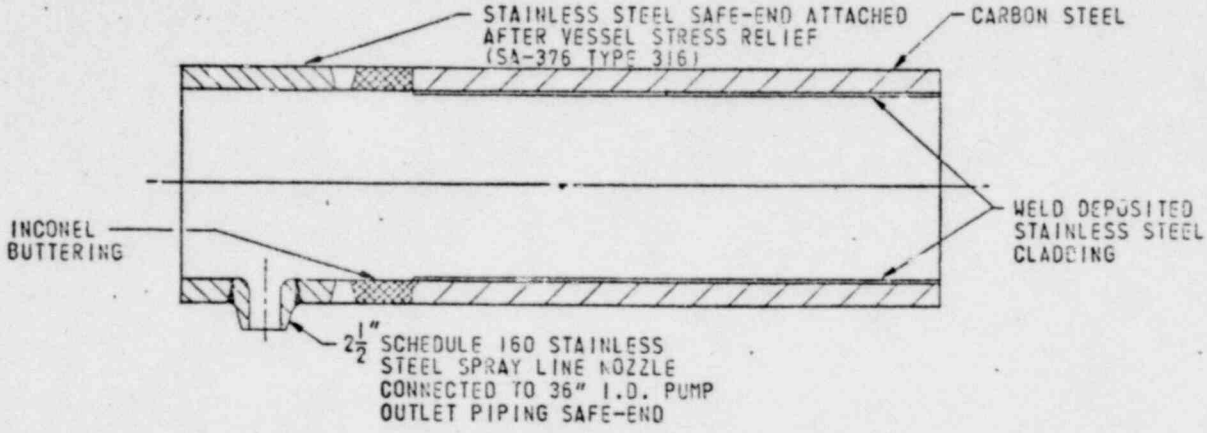


FIGURE 3

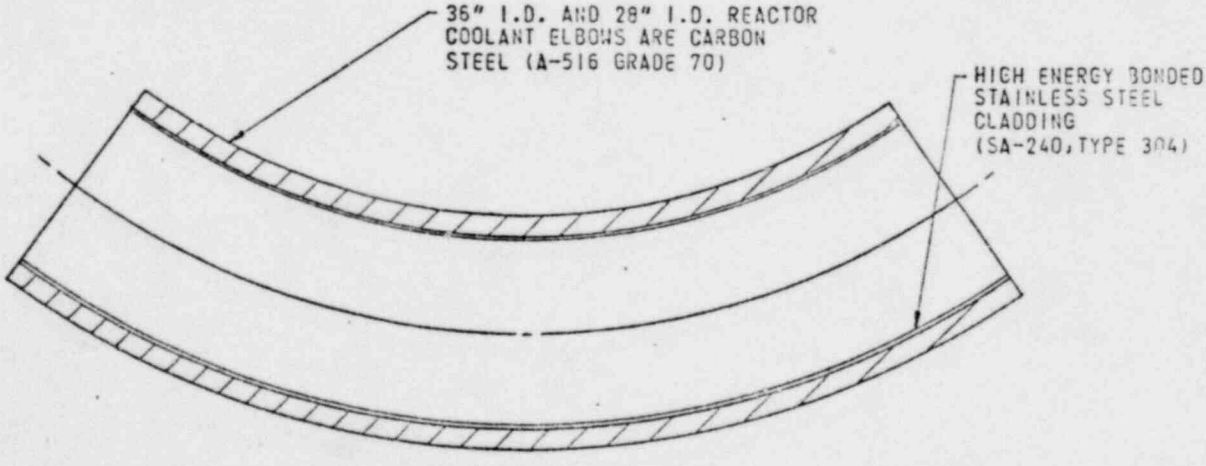
SCHEMATIC OF METROPOLITAN-EDISON'S TMI#1 & TMI#2 PRESSURIZER



A. STRAIGHT SECTION (TMI 1 & 2)



B. PIPE CONNECTION TO REACTOR COOLANT PUMP INLET AND OUTLET (TMI 1 & 2)



C. ELBOW (TMI 1 & 2)

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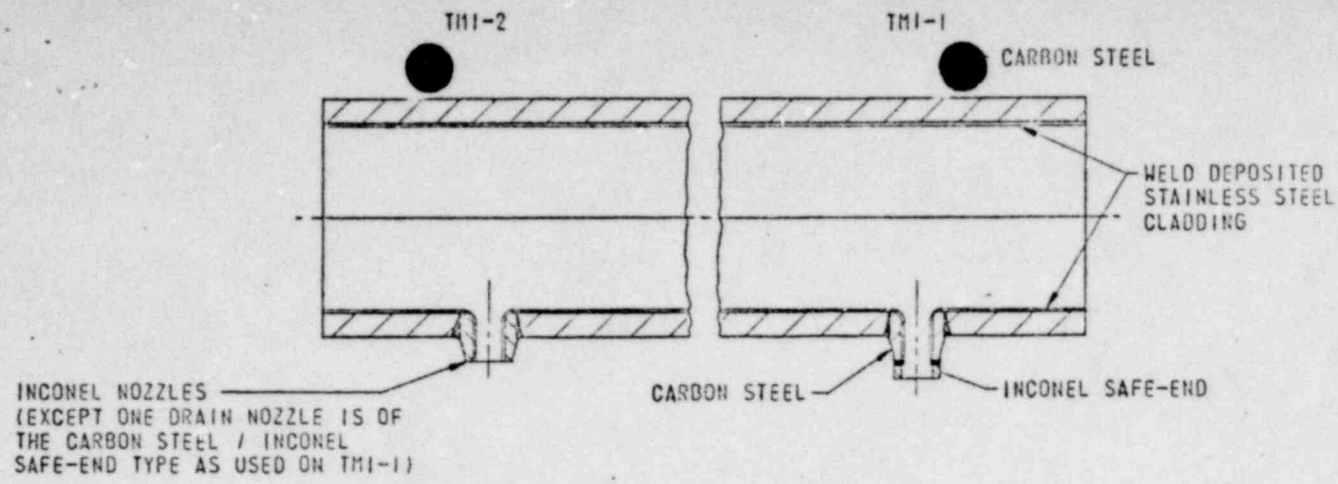
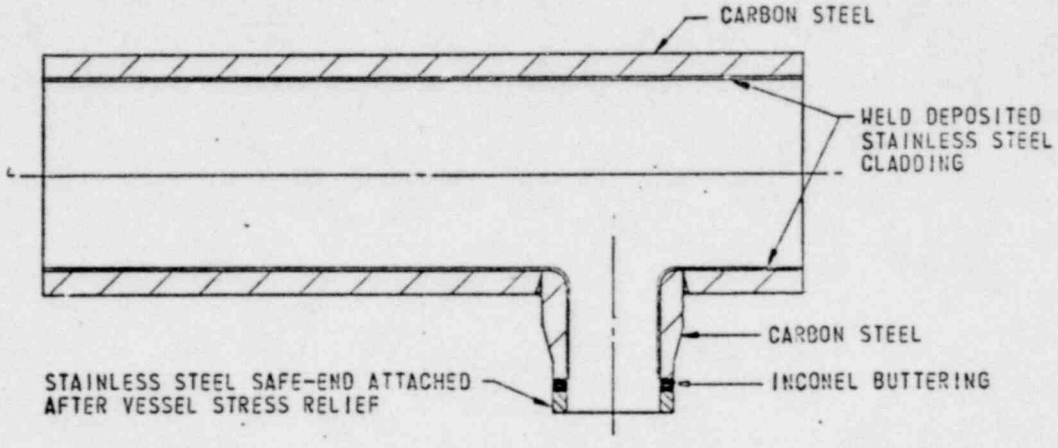
SCHEMATIC OF MET-ED'S TMI 1 & 2 REACTOR COOLANT SYSTEM PIPING

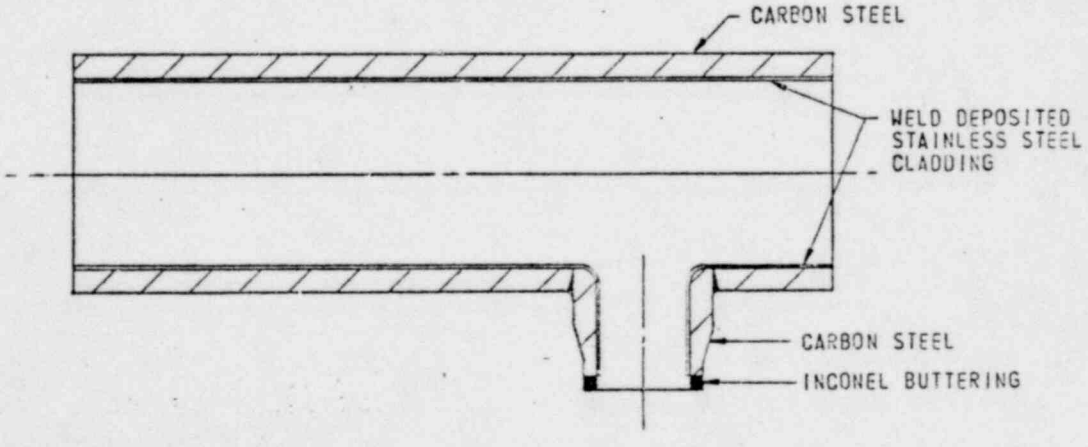
FIGURE 4A



D. INSTRUMENT SAMPLE VENT AND DRAIN PENETRATIONS CONNECTION TO THE REACTOR COOLANT PIPING THAT ARE LESS THAN 4" I.D.



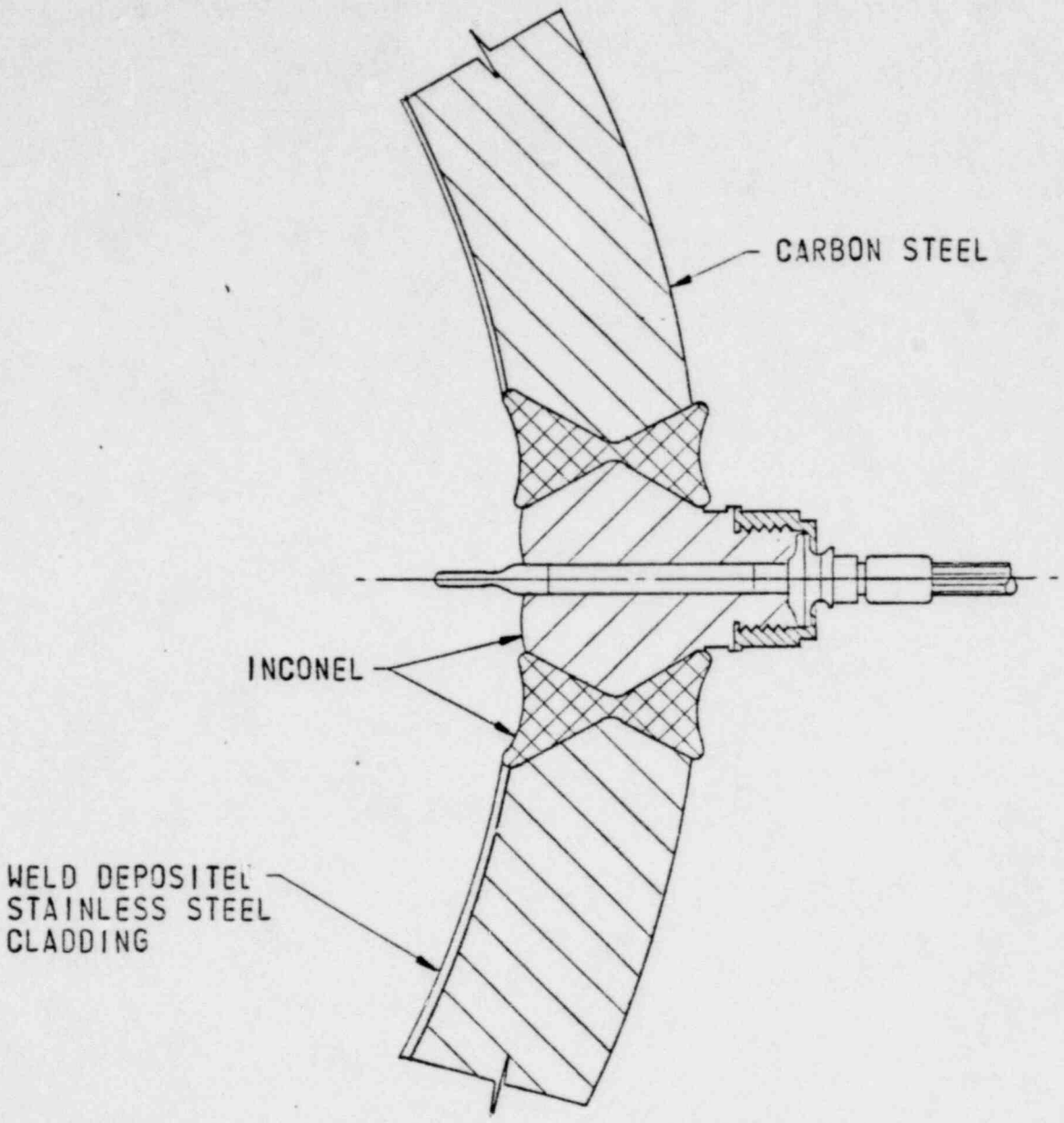
E. $2\frac{1}{2}$" SCHEDULE 160 HIGH PRESSURE INJECTION NOZZLES (4) CONNECTION TO THE REACTOR COOLANT PIPING (TMI 1 & 2)



F. 12" SCHEDULE 140 DECAY HEAT AND 10" SCHEDULE 140 SURGE LINE CONNECTION TO THE REACTOR COOLANT PIPING (TMI 1 & 2)

SCHEMATIC OF MET-ED'S TMI 1 & 2 REACTOR COOLANT SYSTEM PIPING

FIGURE 4B



G. RESISTANT THERMOMETER PENETRATION IN REACTOR COOLANT PIPING (TYPICAL) (TMI 1 & 2)

SCHEMATIC OF MET-ED'S TMI 1 & 2 REACTOR COOLANT SYSTEM PIPING

FIGURE 4C

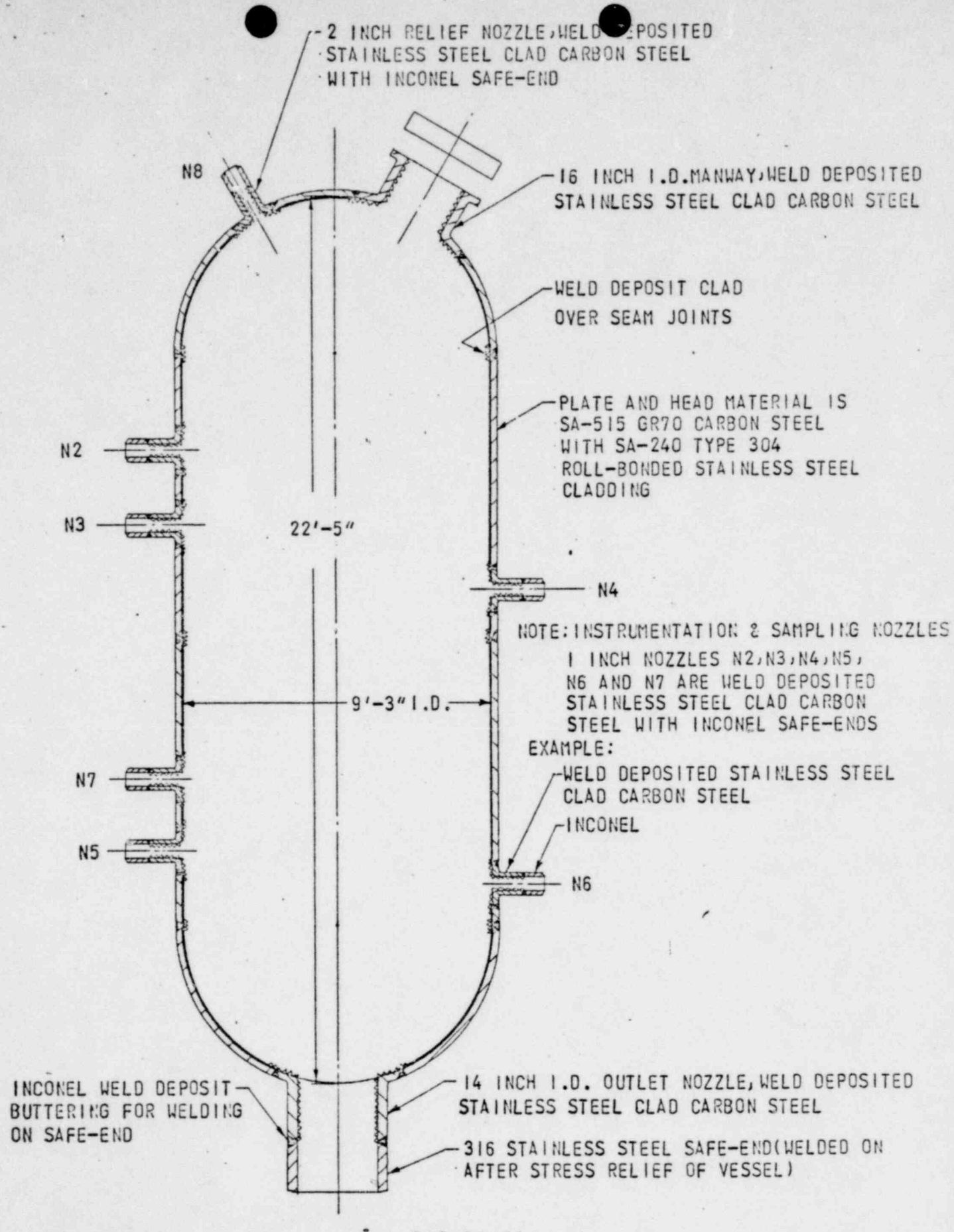


FIGURE 5A

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SCHEMATIC OF MET-ED'S TMI#1 CORE FLOODING TANKS

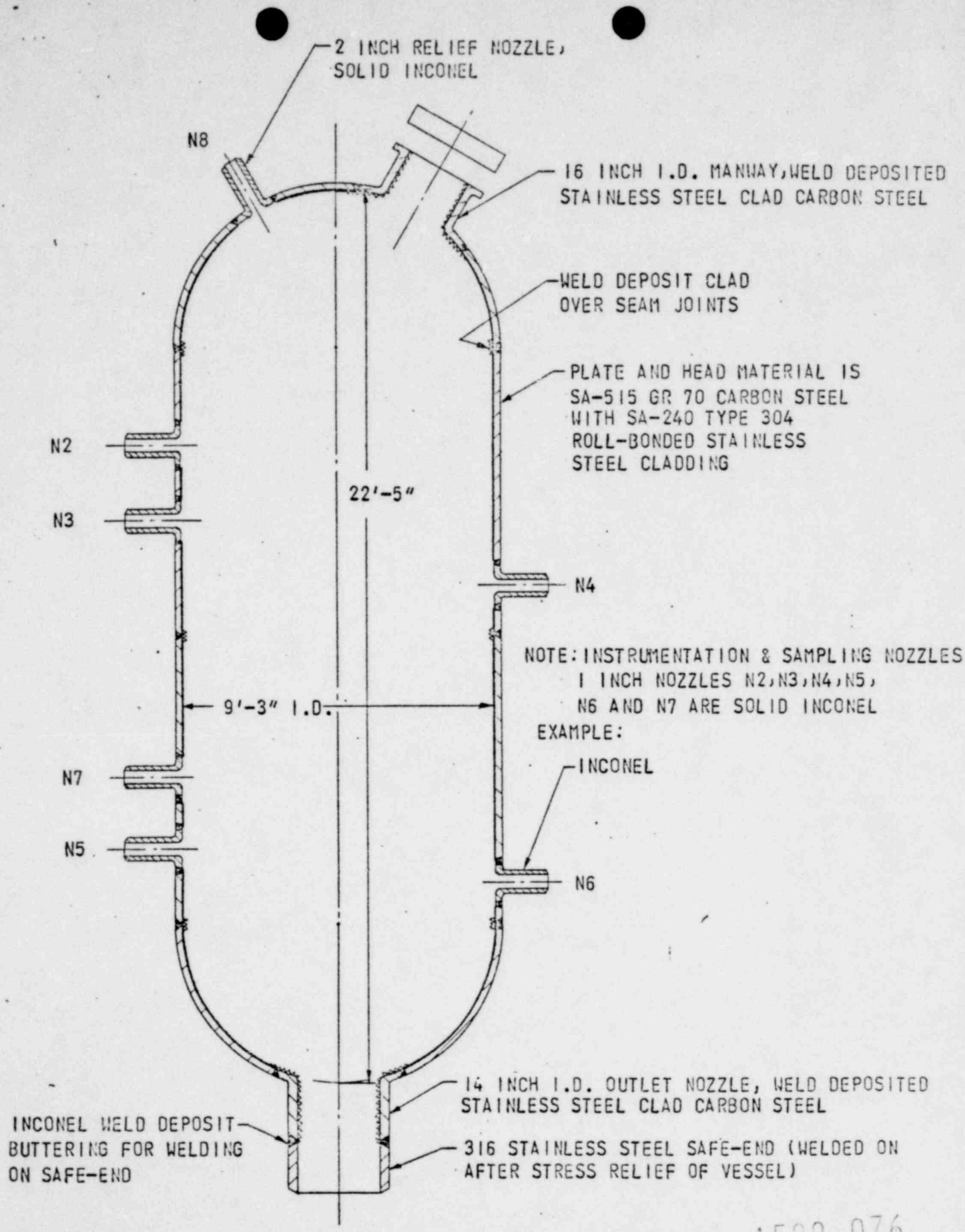

FIGURE 5B

1583 076

SCHEMATIC OF MET-ED'S TMI#2 CORE FLOODING TANKS

FROM: Metropoletan Edison Co. Reading, Penn. J.G. Miller	DATE OF DOCUMENT: 6-3-70	DATE RL /ED 6-11-70	NO.:
	LTR. X	MEMO:	REPORT: OTHER:
TO: C.G. Long, DRL	ORIG.: 1	CC:	OTHER:
	ACTION NECESSARY ☐ NO ACTION NECESSARY ☐	CONCURRENCE ☐ COMMENT ☐	DATE ANSWERED: BY:
CLASSIF: U	POST OFFICE	FILE CODE: 50-289-320	
	REG. NO:		

DESCRIPTION: (Must Be Unclassified)

Ltr trans the following, per our request...to eliminate the use of all furnace sensitized stainless steel from pressure retaining structural portions of the coolant system..

ENCLOSURES: (1 cy)

Furnace sensitized stainless steel in pressure retaining & structure Portions TMI Nos 1-2, Primary Systems... & Fifures 1 thru 5 B

REMARKS:

NOTE- Above to be filed formal in July 1970

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