

N93-26965



SPACE PROPULSION TECHNOLOGY DIVISION



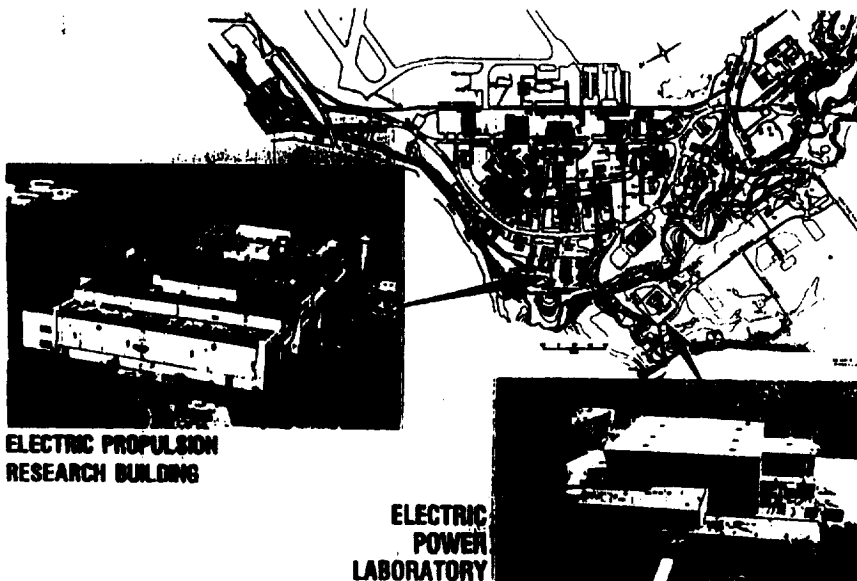
### NEP FACILITIES (LERC)

Nuclear Propulsion Technical Interchange  
October 21, 1992

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Facility Manager/EPL, EPRB, Stirling

NASA  
C-18-05473

### SPACE SIMULATION FACILITIES Lewis Research Center



ELECTRIC PROPULSION  
RESEARCH BUILDING

ELECTRIC  
POWER  
LABORATORY



**EPRB**

**ELECTRIC PROPULSION RESEARCH BUILDING(#16)**

**FACILITIES**

VACUUM CHAMBERS (9): RANGE FROM 3FT. TO 10FT. DIA.

BELL JAR SYSTEMS (6)

**CAPABILITIES**

EXTREMELY HIGH (~ 1000 STD L/M - H<sub>2</sub> @ 10<sup>-1</sup> TORR) PUMPING SPEEDS

HIGH VACUUM LEVELS (10<sup>-7</sup> TORR)

CRYOPUMPED CHAMBERS

**ACTIVITIES**

COMPONENT DEVELOPMENT

THRUSTER TESTING

POWER CONDITIONING INTEGRATION



**EPL**

**ELECTRIC POWER LABORATORY (BLDG.301)**

**FACILITIES:**

VACUUM CHAMBERS(3): 5FT. X 15FT.; 15FT. X 63FT; 25FT. DIA. X 82FT. LONG

BELL JAR SYSTEMS(7)

**MAJOR FEATURES:**

CLOSED LOOP REFRIG. SYSTEM TO ODP TRAPS

FULLY AUTOMATED

<<< UTILIZATION - >>> LOW OPERATING COST & MANPOWER REQUIREMENTS

**TANK 6:**

\* 20 OD PUMPS; 4 FORELINE BLOWERS; 3 MECHANICAL PUMPS

\* > 240 KW THERMAL REJECTION LN<sub>2</sub> COOLED SHROUD

o SOLAR SIMULATOR

**TANK 5:**

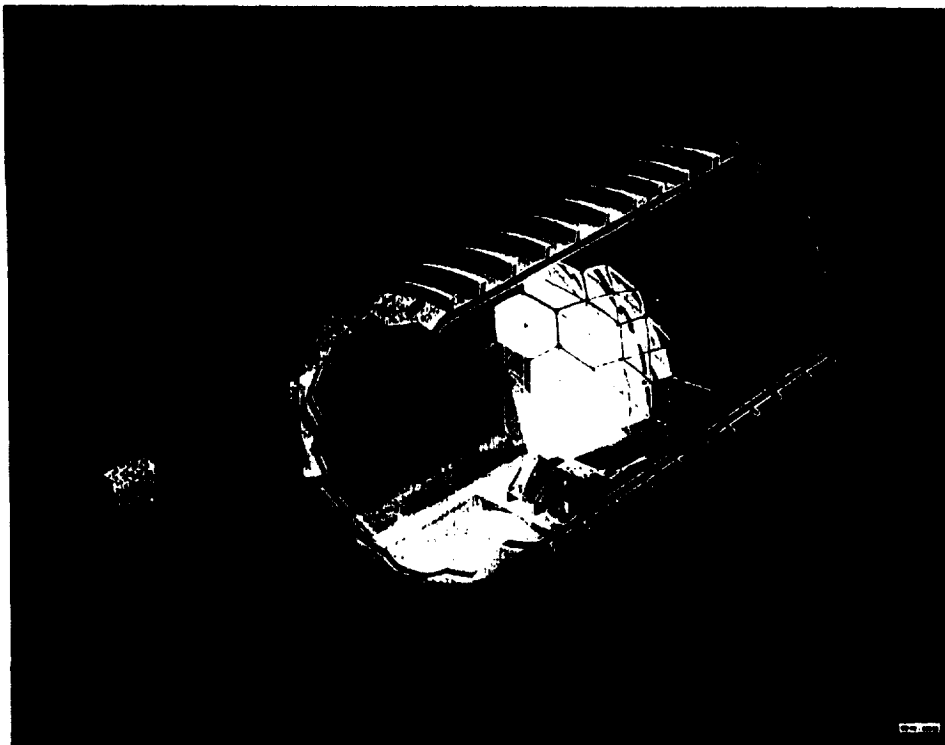
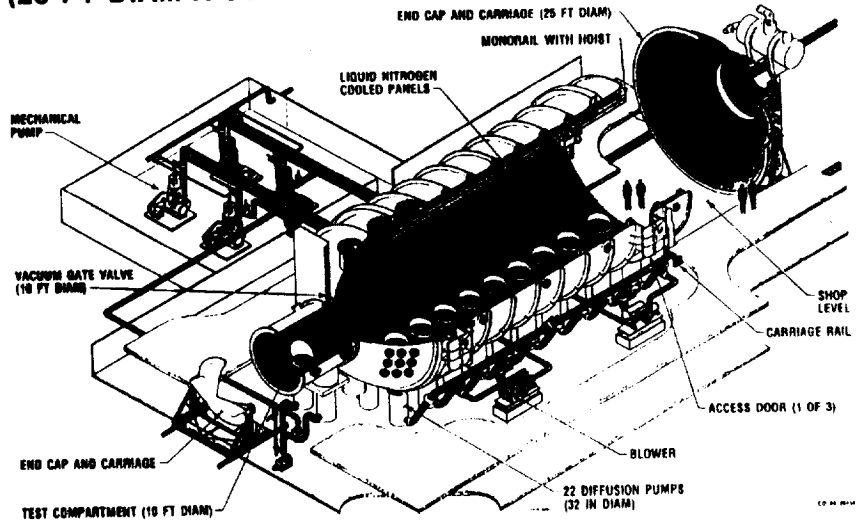
2000 PUMPS; 4 FORELINE BLOWERS; 4 MECHANICAL PUMPS

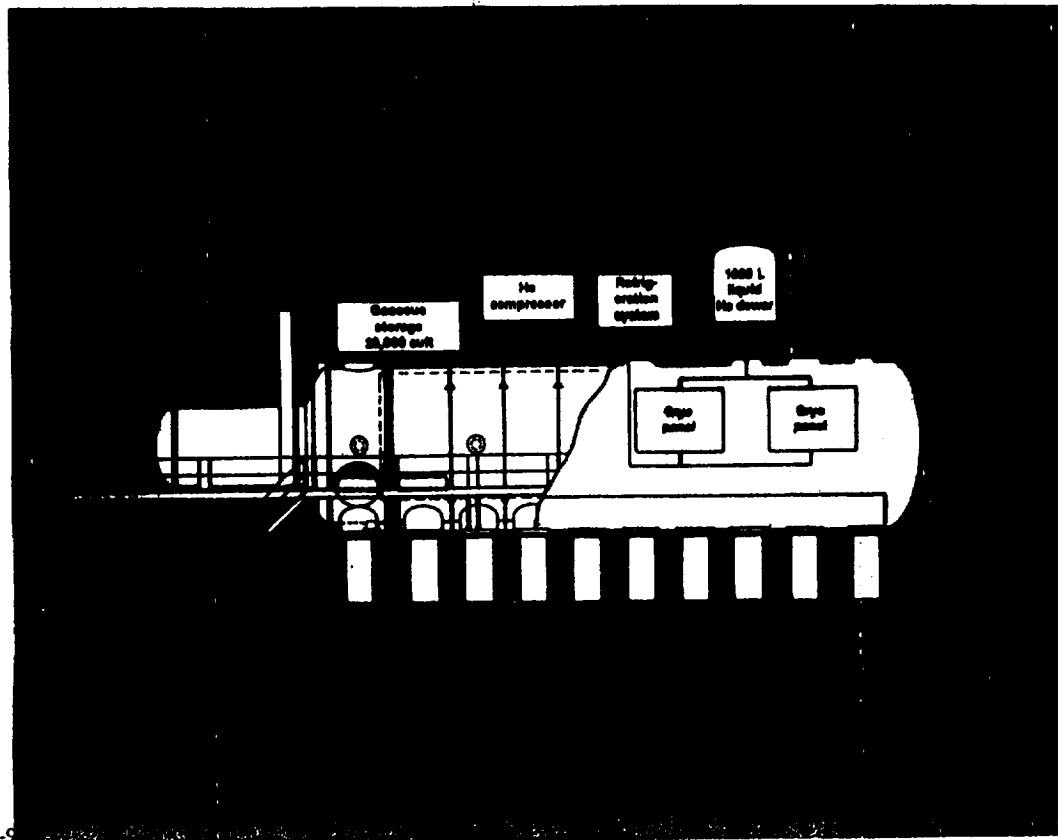
41M<sup>2</sup> CRYOPANEL - GHe/LHe REFRIGERATOR/LIQUIFIER CRYO-SYSTEM

\* EXPECTED IN POST 1991 COF PROJECT

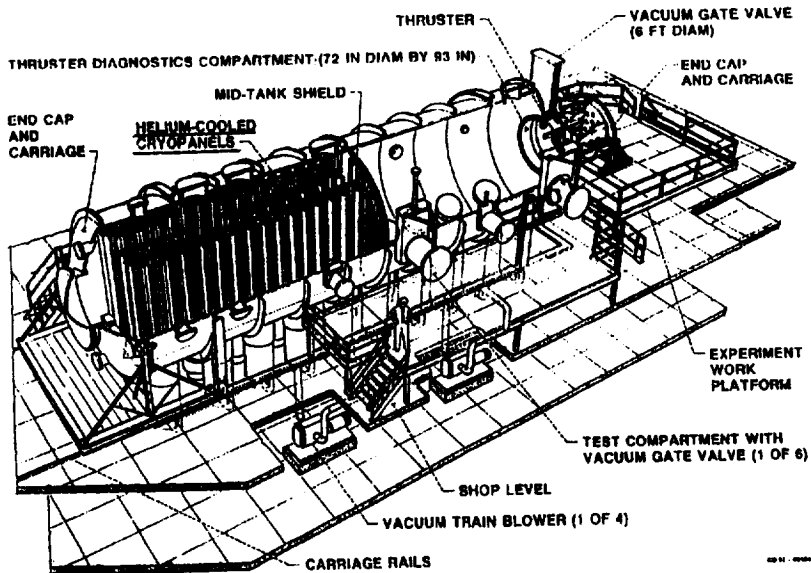
o ADVOCATE: 5400; INSTALL & OP 1994/1995

# Lewis Research Center TANK 6 VACUUM FACILITY (25 FT DIAM X 82 FT OVERALL)



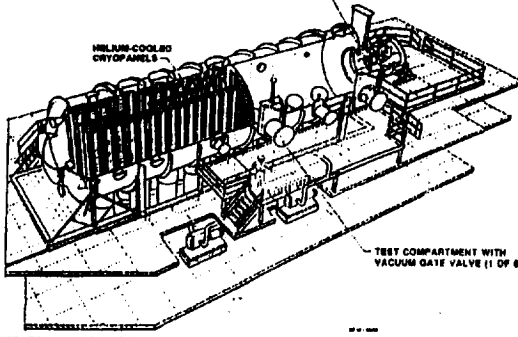
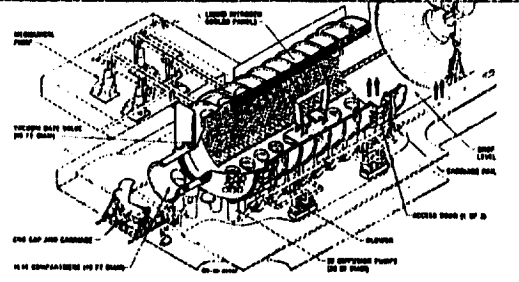


NP-TIM-9



		SPACE PROPULSION TECHNOLOGY DIVISION			NASA Lewis Research Center
NUCLEAR ELECTRIC PROPULSION					
<u>LOW THRUST. ELECTRIC</u>					
	5KW (Xe)	ION 25KW (Xe, Kr)	MPD 100KW (H <sub>2</sub> )	200KW (Ar)	
$\dot{M}$ (Mg/s)	5.3	27	40	320	
REQ'D.PRESS.(TORR)	$<1.0 \times 10^{-5}$	$<1.0 \times 10^{-5}$	$<3.0 \times 10^{-4}$	$<3.0 \times 10^{-4}$	
<u>TANK 5 FACILITY</u>					
(20)ODP/ $\dot{M}$ (Mg/S)	5.3	22	25.5	100	
ACTUAL PRESS(TORR)	$1.3 \times 10^{-5}$	$3.7 \times 10^{-5}$	$4.8 \times 10^{-4}$	$2.3 \times 10^{-4}$	
CRYOPANEL/ $\dot{M}$ (Mg/S)	8.0	TBD	TBD	155	
ACTUAL PRESS (TORR)	$1.2 \times 10^{-5}$	TBD	TBD	$1.0 \times 10^{-4}$	
<u>FOCUS</u>					
[USING FOUR(4) FORELINE BLOWERS & MECH. PUMPS = 300 Mg/SEC @ $6 \times 10^{-1}$ TORR - H <sub>2</sub> ]					

Test Facilities For Electric Propulsion At NASA LeRC



Tank has been cleaned of mercury contamination

20,000 l/s ion pumps  
 20,000 l/s oxygen pumps  
 20,000 l/s xenon pumping capability

Tank's 40 l/s cryopump system operational

Tank's pumping capability is unique to NASA with 20,000 l/s and cryopump yielding 40,000 l/s for xenon

CD-92-61505