

SURVEY OF WEAPONS DEVELOPMENT AND TECHNOLOGY

WR708

SESSION XII

•NUCLEAR TESTING

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PHYSICS PACKAGE DEVELOPMENT TOOLS

- **THEORY**
- **NON-NUCLEAR TESTING**
- **NUCLEAR TESTING**

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NON-NUCLEAR IMPLOSION DIAGNOSTICS

- PHERMEX (RADIOGRAPHY)
- PIN DOME
- HIGH SPEED PHOTOGRAPHY

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NUCLEAR TESTING

- WEAPON DEVELOPMENT
- EFFECTS
- VULNERABILITY AND HARDENING
- STOCKPILE RELIABILITY
- PEACEFUL NUCLEAR EXPLOSIVES

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DIAGNOSTICS

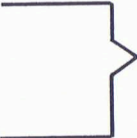
- YIELD
- “ALPHA”
- CHANNEL TEMPERATURES
- INTERSTAGE TIME
- OTHER

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REFERENCES

•LA2000 1947 SRD
•WT900 DEC 1953 SRD



FIREBALL YIELD

•SAND 77-0402 - "SHOCK PROPAGATION..." SLIPHER

•DNA-119M REPORT

•DASA 1211 - 1220 REPORTS

•LLNL RESEARCH MONTHLY 3141-83-1033 (DIAGNOSTICS)

•DNA 170M REPORTS

•LASL-LLL SPECIFIC TEST REPORTS

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SURVEY OF WEAPONS DEVELOPMENT AND TECHNOLOGY WR708

SESSION XIII

•TRANSFER SYSTEMS

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GAS TRANSFER SYSTEM TECHNOLOGY

STEVEN ROBINSON, 8412

COMPONENT DEVELOPMENT DEPARTMENT

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SANDIA GAS TRANSFER SYSTEMS

- Classification
- Introduction
- Examples
 - Systems
 - Reservoirs
 - Valves
- Concerns

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BOOSTING

DEUTERIUM AND TRITIUM ARE USED TO MAKE PLUTONIUM BURN MORE EFFICIENTLY (I.E., TO "BOOST" THE FISSION YIELD).

HIGH EXPLOSIVE



"SLOW" FISSION BURN



IGNITION OF D/T



FLOOD OF HIGH ENERGY NEUTRONS



"FAST," EFFICIENT FISSION BURN

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WEAPON BOOSTING REQUIRES THE
ABILITY TO STORE MIXTURES OF
HYDROGEN ISOTOPES AND TO DELIVER
THE APPROPRIATE MIXTURE ON DEMAND

THIS REQUIRES

- Containment reservoirs
- Flow Systems
- Explosive Valves

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CHALLENGES WITH GAS TRANSFER SYSTEMS

- Long Term Degradation
- Constancy of Delivery
- Complex Plumbing
- Minimization of Weight and Volume
- Cost

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STOCKPILE LIFE, YEARS

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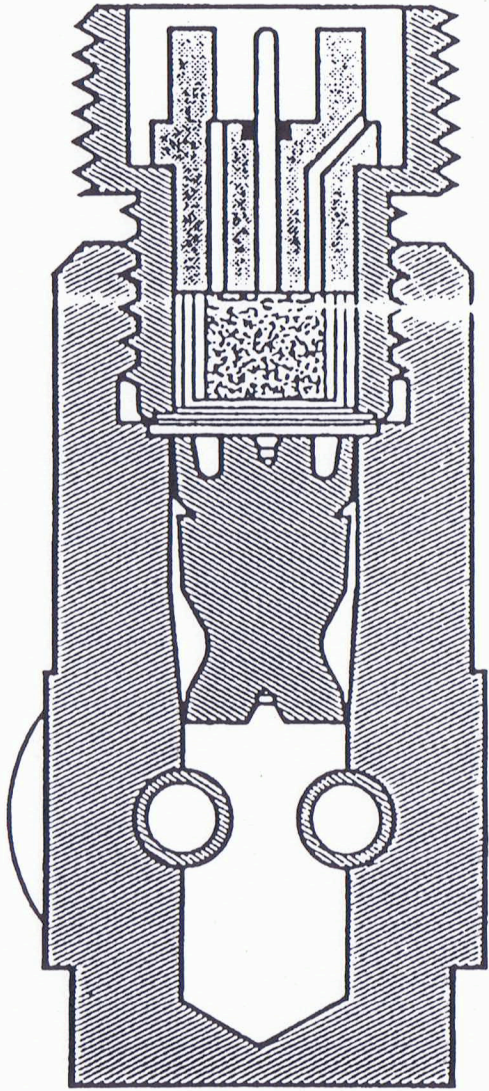
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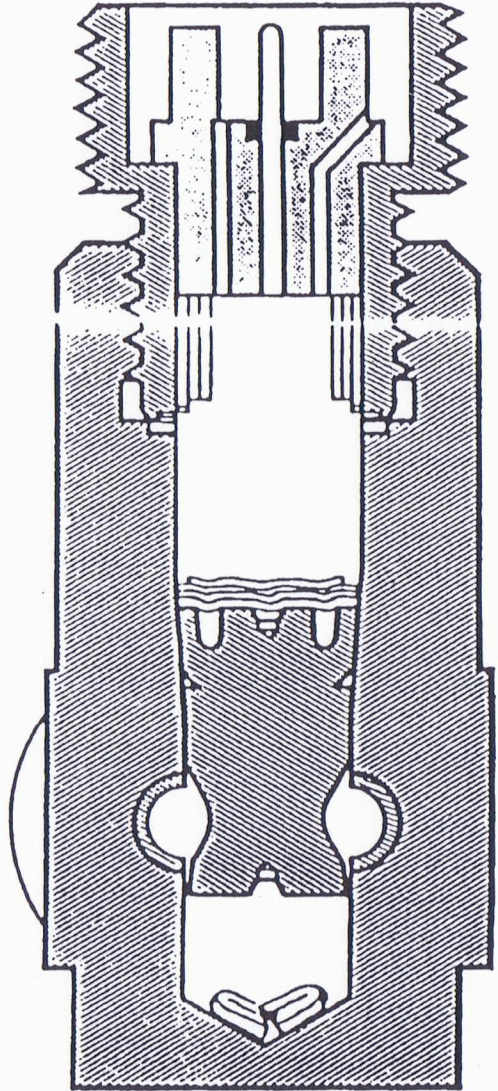
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BEFORE



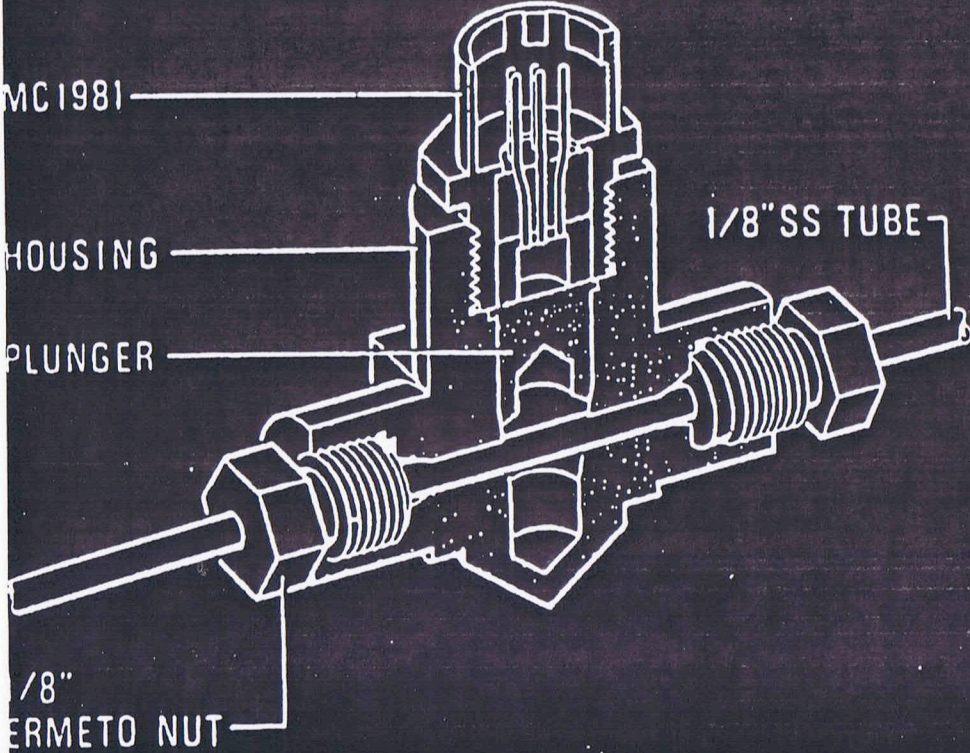
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EXPLOSIVE VALVE OPERATIONAL SEQUENCE

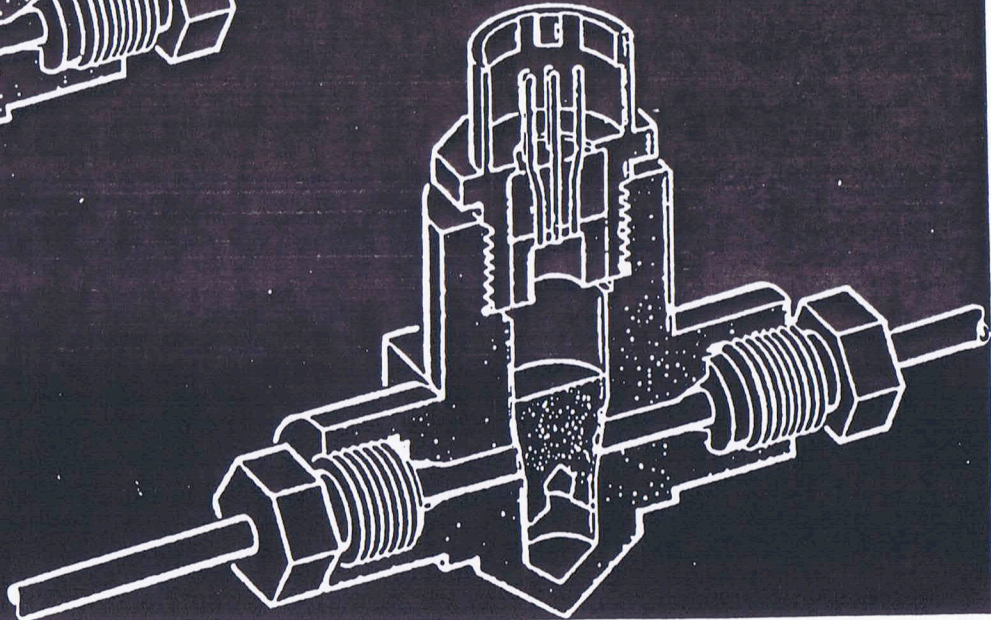
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CLOSURE
VALVE

BEFORE ACTUATION



AFTER ACTUATION



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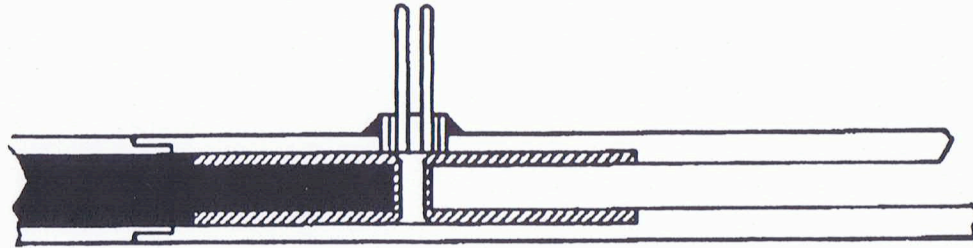
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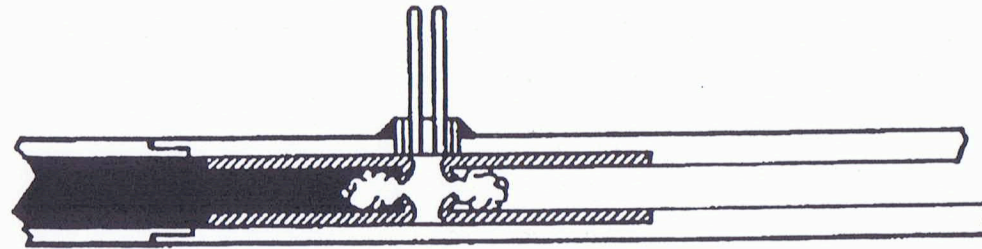
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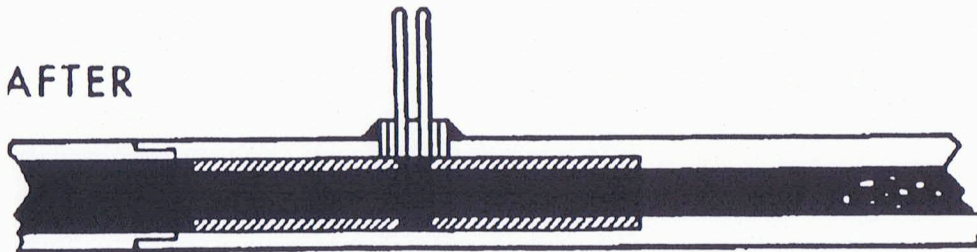


BEFORE

EXPLODING DISK VALVE OPERATIONAL SEQUENCE



DURING



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