

G0 Liquid Hydrogen Target

*R. D. McKeown
DOE/NSF Review
June 6, 2001*

I. Personnel Issues

II. Fabrication/Assembly **COMPLETED!**

(1) Target Cell, Cryoloop, Gas Handling System

(2) Monitoring and Control System

(3) Service Module and Service Lines

III. Plans for Testing the Integrated Target System

(1) TJNAF Test Lab

Target system + test chamber

June 2001

(2) Hall C

Target system + SMS

~March 2002

Personnel Issues

Departure of C. Jones - July 2000

Addition of K. Gustafsson (Caltech postdoc)

Revised responsibilities:

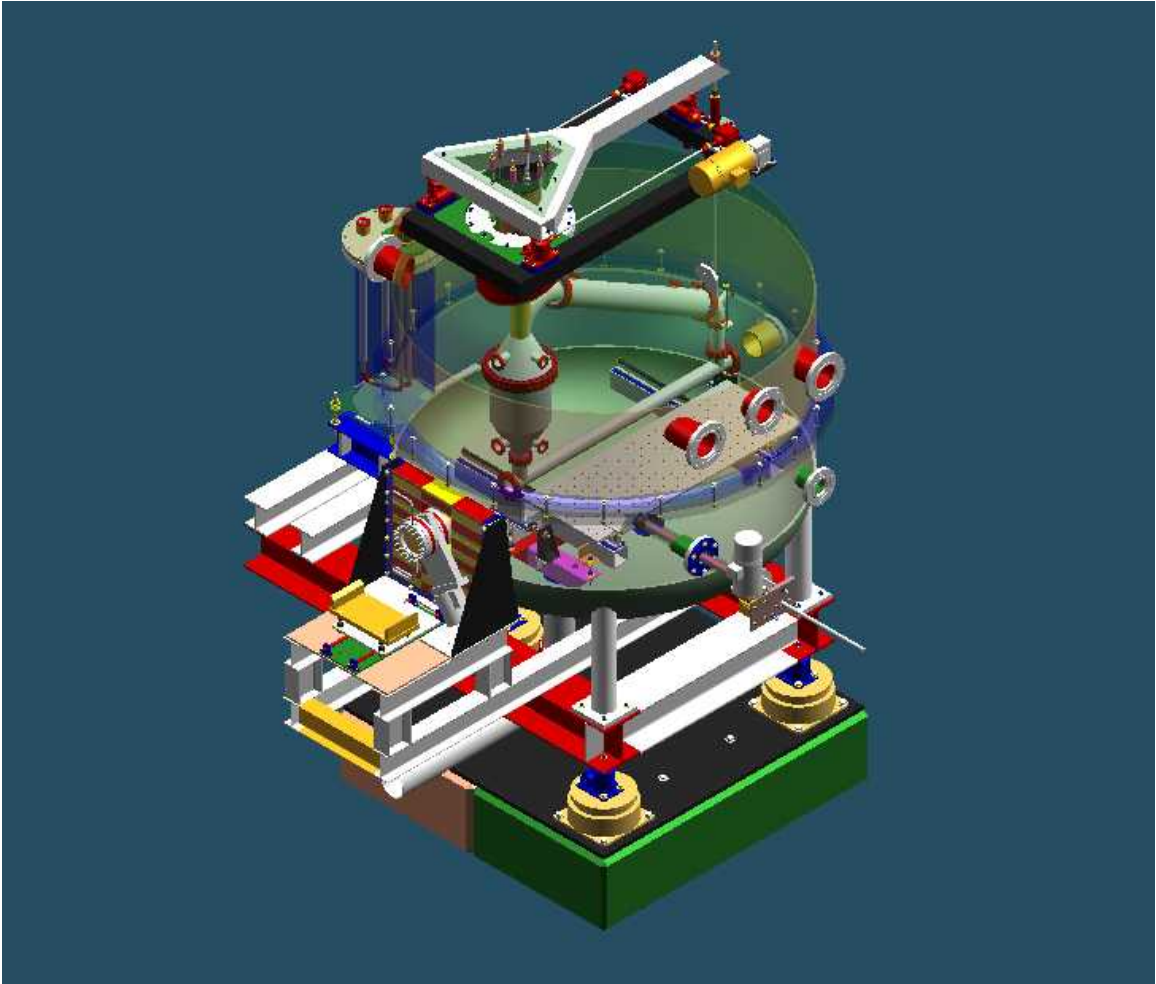
Subsystem manager - R. McKeown

Technical coordination - K. Gustafsson

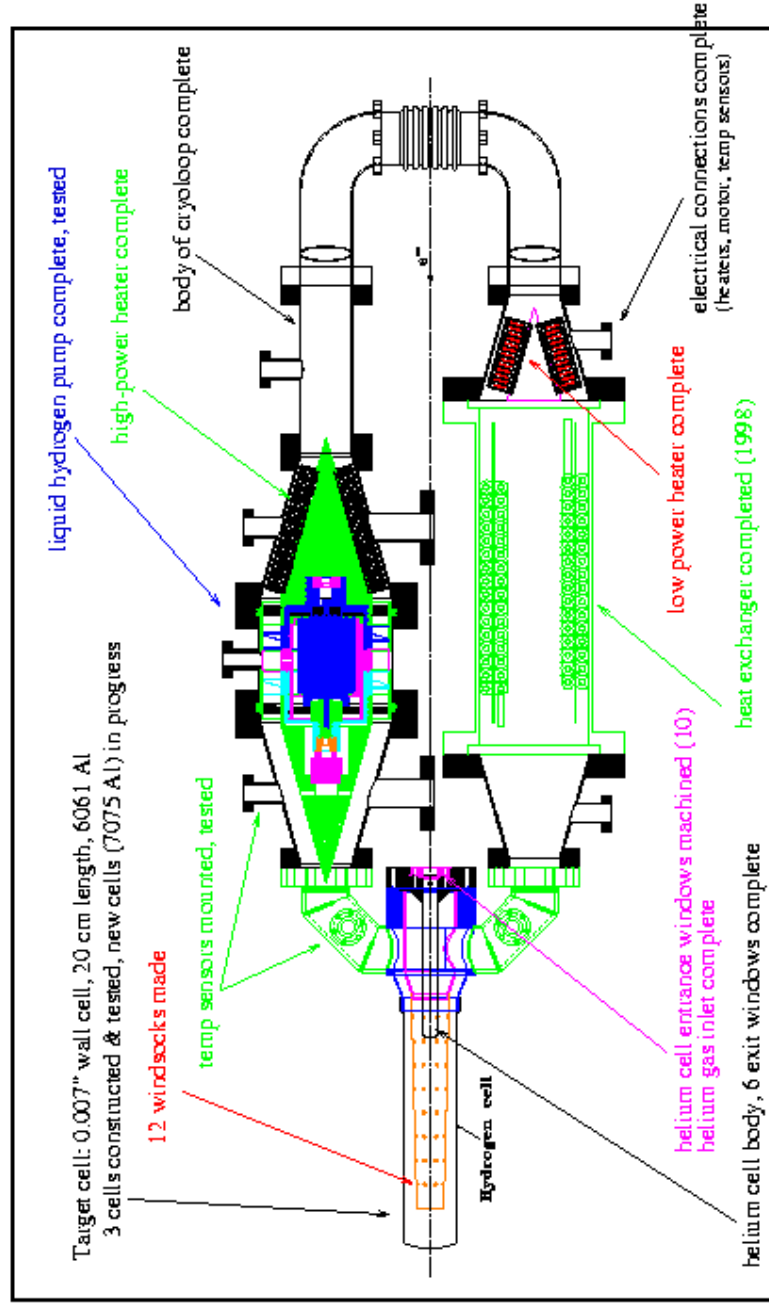
Expertise impact

Highly experienced team for
construction/assembly/commissioning

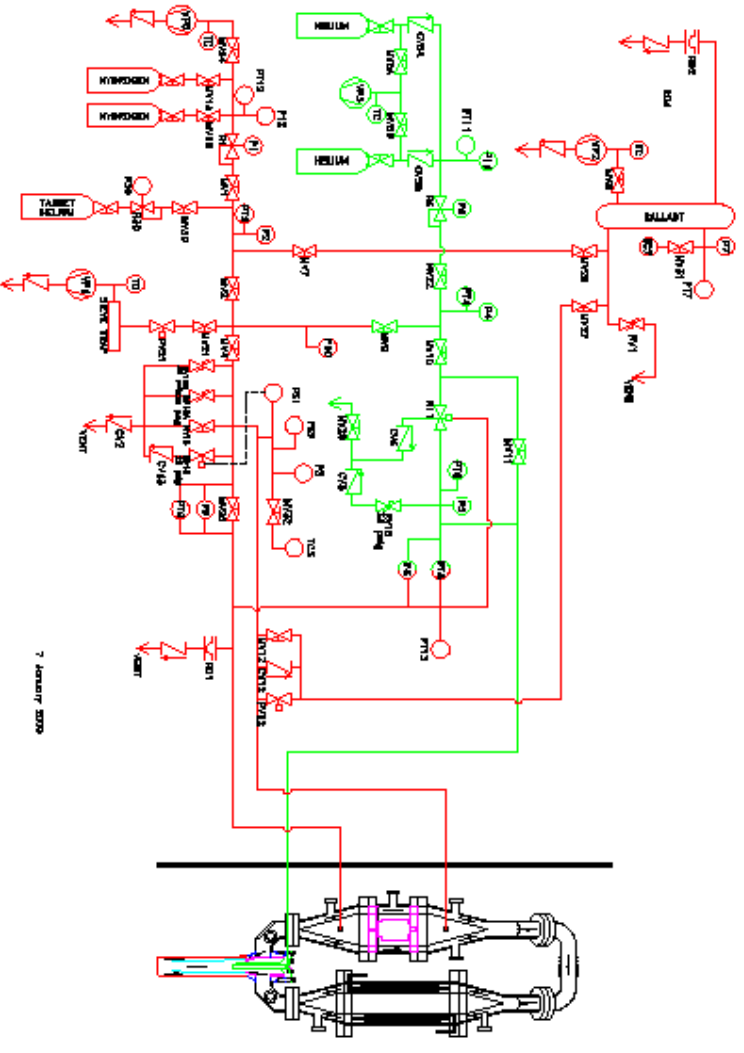
Design expertise diminished



Status of Target Cell and Cryogenic Loop



Target Gas Handling System

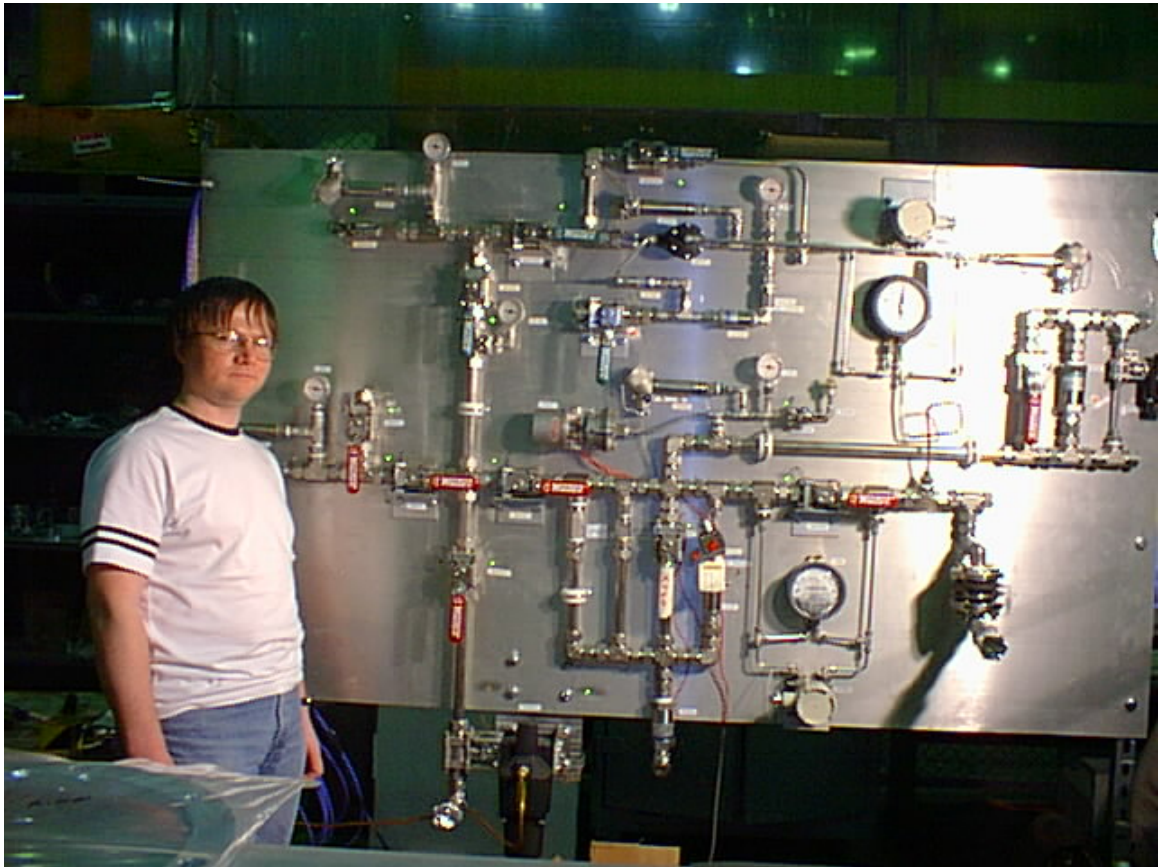


Gas handling circuit complete, mounted to movable panel

Vacuum and pressure leak testing complete

Microswitches mounted on valves

Electrical connections complete



Monitoring and Control System

< Based upon EPICS software with VME interface >

SOFTWARE

EPICS code written by member of Accelerator Division, JLab
First draft complete - Jan. 2001

HARDWARE

VME Modules

All components purchased (with Hall C funds)

Commercial Hardware

All components purchased

Custom Hardware

Complete - Jan 2001

target heater override circuit

JT valve controller

pump controller

cable breakout boxes

CABLES

Test lab - 90% complete, ready for cooldown

Hall C - Specification complete

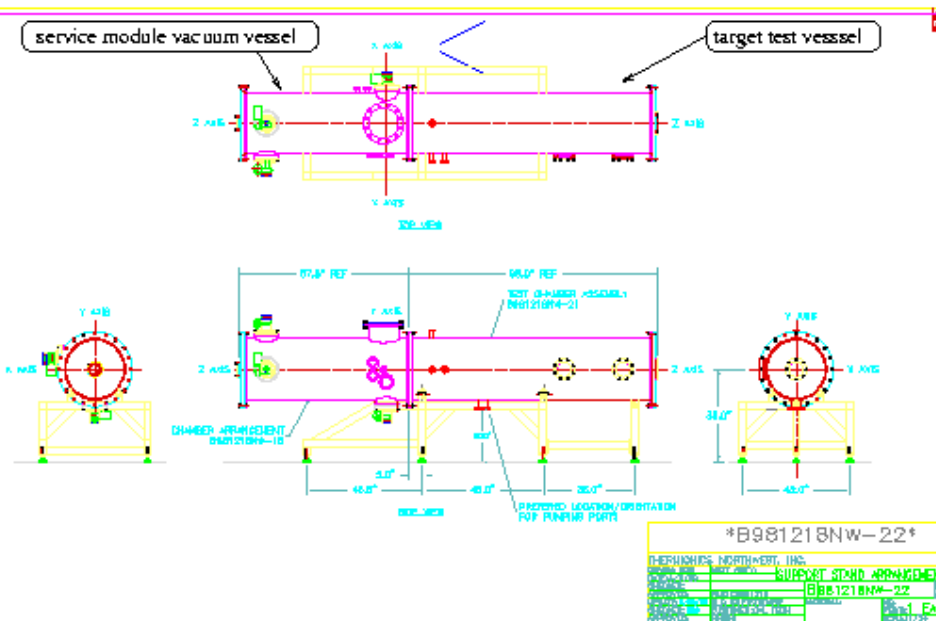
Service Module

Thermionics Northwest scope

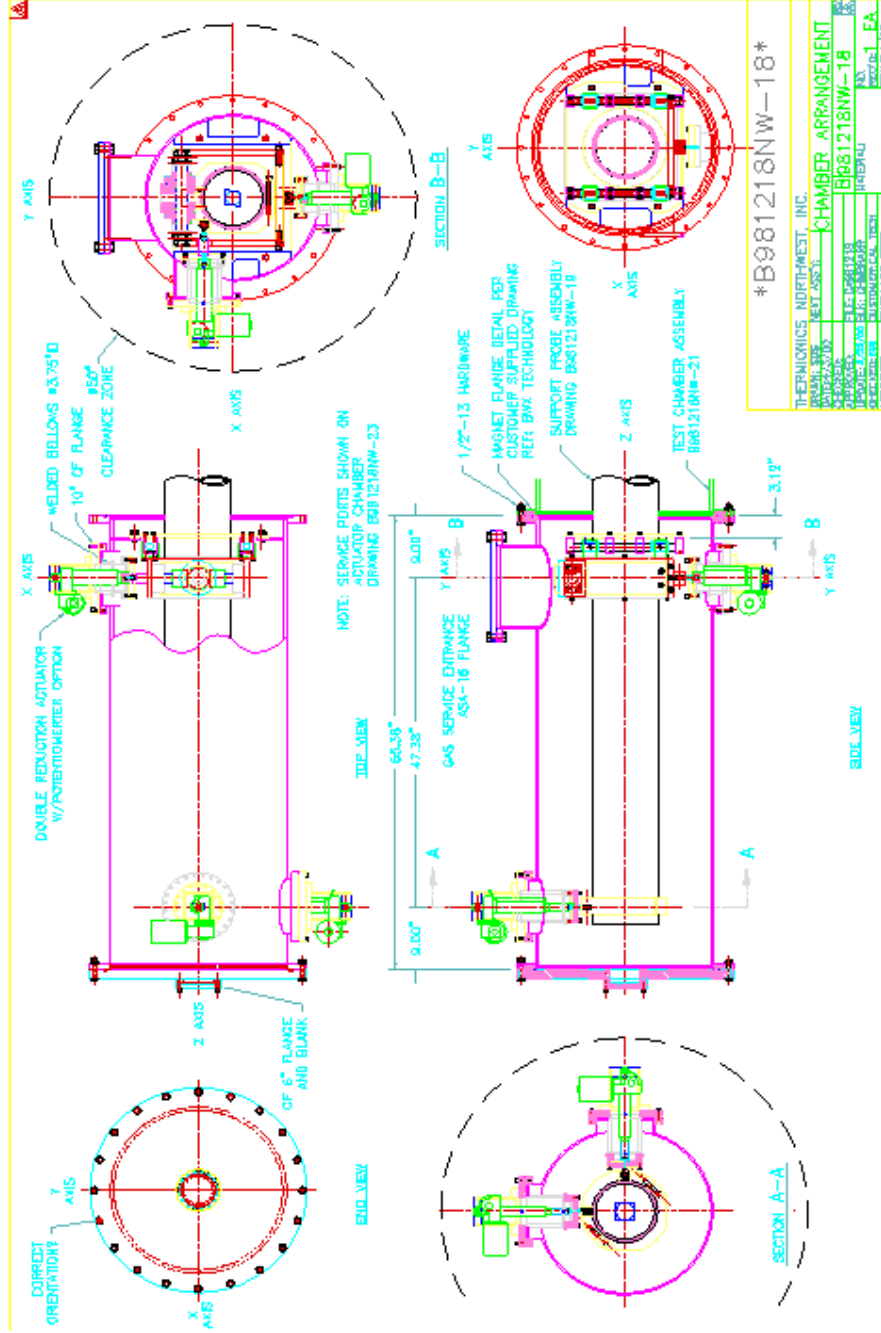
1. vacuum vessel interfacing upstream end of SMS to beamline
2. support target cryoloop on cantilever inside magnet
3. transverse motion mechanism to align target to magnetic center of SMS
4. remote-controlled mechanism to move target in/out of beam path
5. target test vessel and stand

Caltech scope

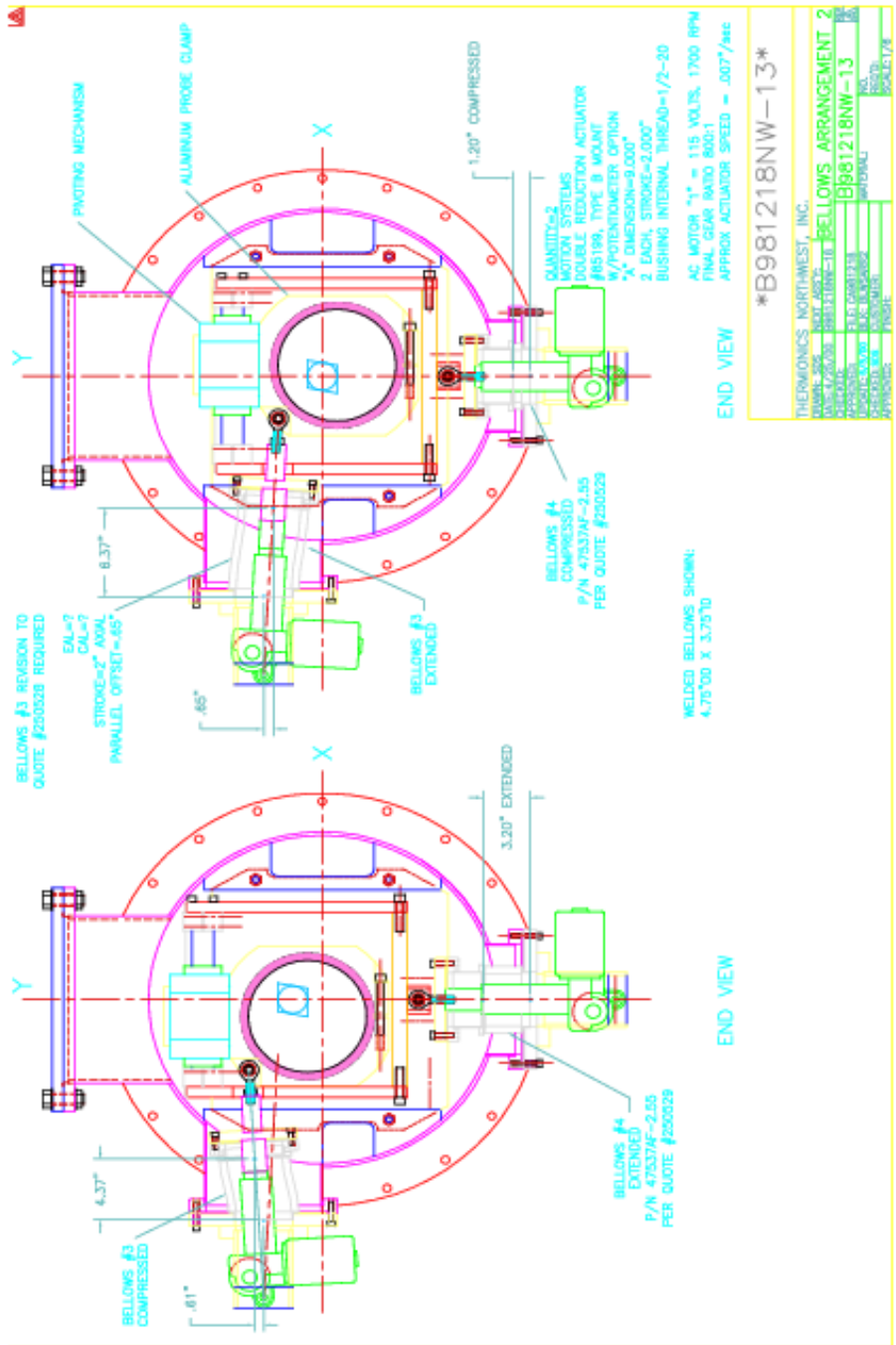
gas, coolant, and electrical service lines to cryoloop

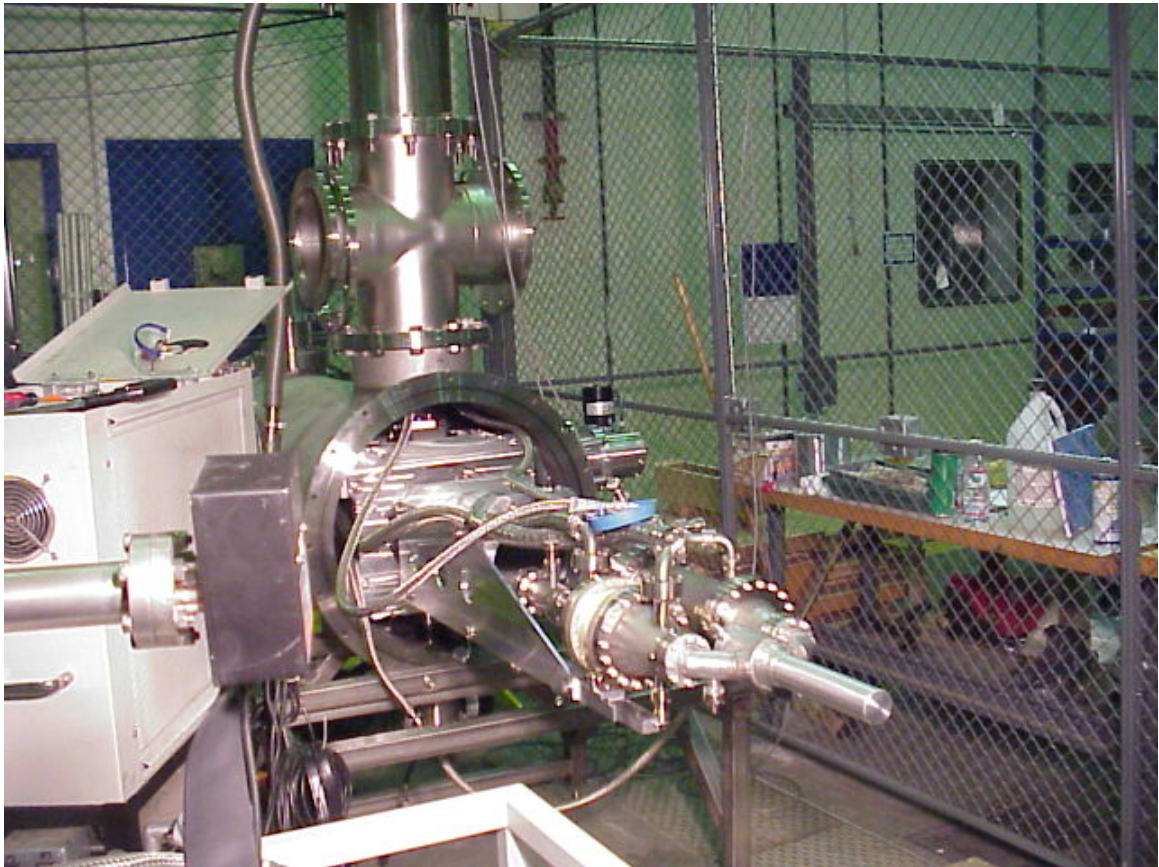


View of Support and Position Mechanism



Positioning mechanism for G0 target



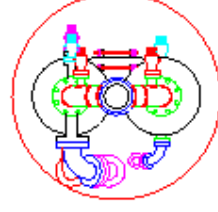
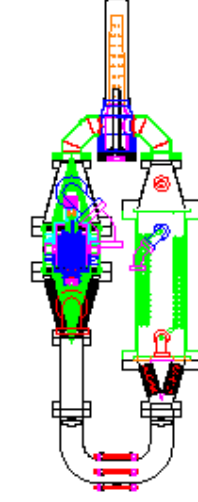
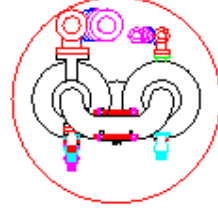
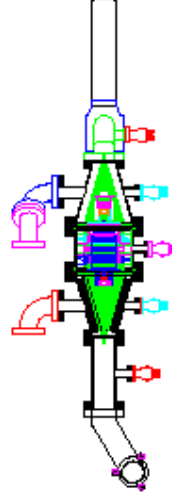


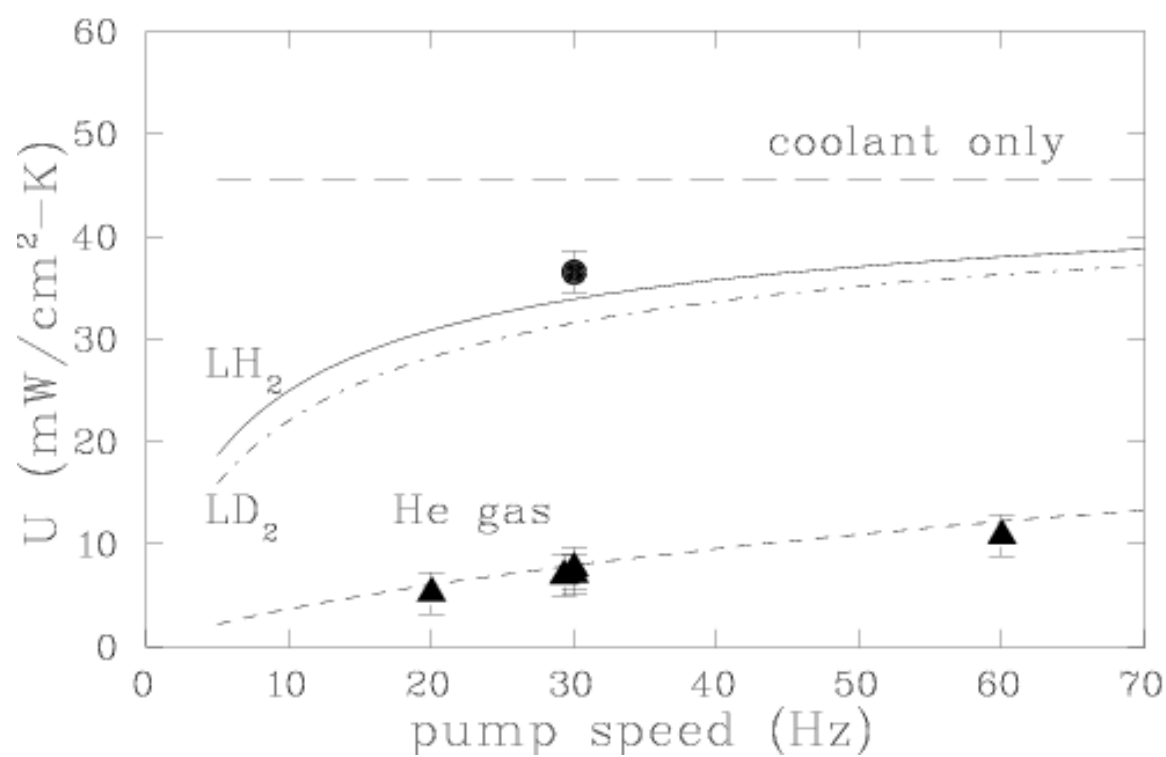
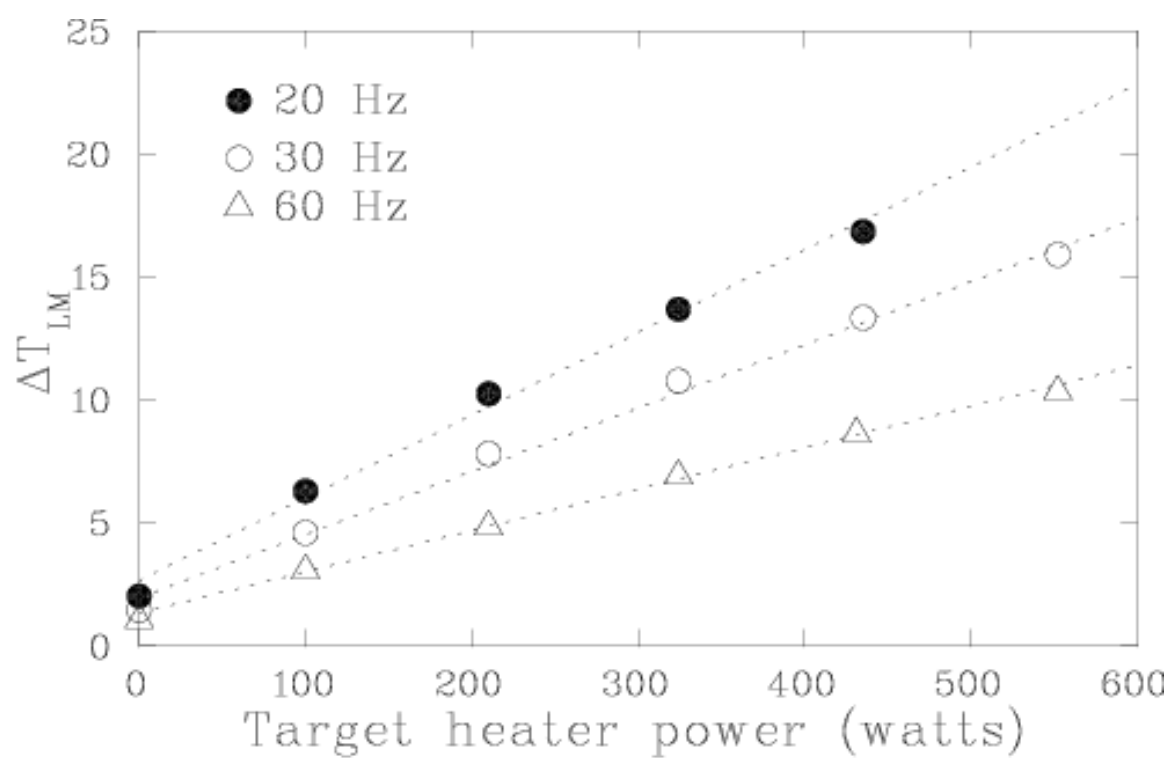


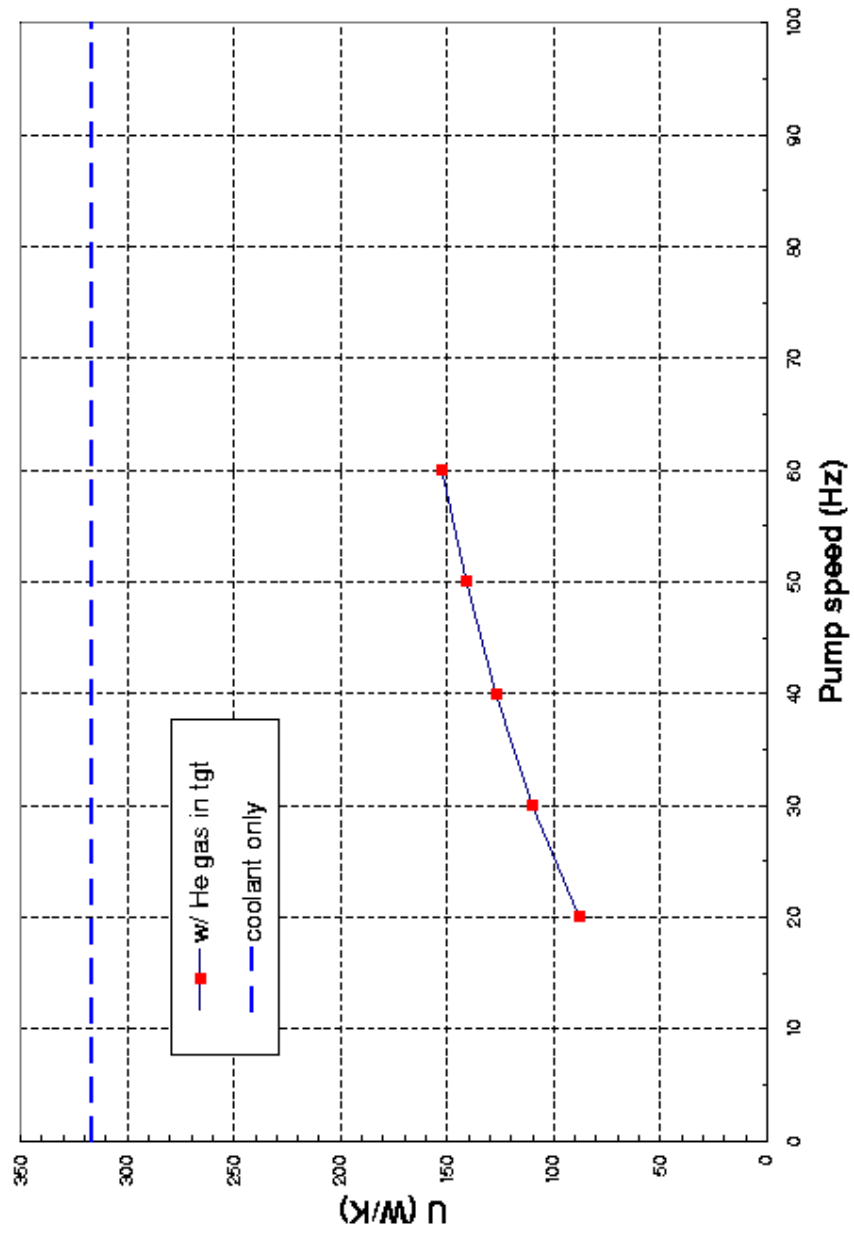
Target tests to be done in Test Lab:

*** Gaseous helium - no hydrogen test ***
(no hydrogen vent line, hydrogen safety issues)

- Cool target with helium gas in loop
- pressure test cryotarget at cryogenic temperature
- Test control/monitoring software and hardware
- Test pump operation at cryogenic temperatures (no liquid load)
- Test heat exchanger efficiency
- Test alignment change from thermal contraction (x,y,z)







Additional Considerations

DOE/NSF Review
June 6, 2001

Beam - Target Interface (A. Lung, Jlab)

- Beam Halo Estimates

- Beam Steering / Fast Shutdown

Backup pump design (G. Smith, Jlab)

- Identify higher power motor

- Develop alternate design based on new motor

Documentation (R. Carr, K. Gustafsson, Caltech + UMD personnel)

- Operations Manual

- Safety Documentation

LH Target Summary

DOE/NSF Review
June 6, 2001

Fabrication complete - system delivered and assembled

Used ~20K contingency

Ready for first cooldown/tests during June/July 2001

~5-6 months float to address any problems encountered

Commissioning in Hall C still being discussed

We will require

Conservative approach to design changes, considering
available resources

Continued support from Hall C / Jlab target group

Adequate commissioning in Hall C with Hydrogen
as early as possible.