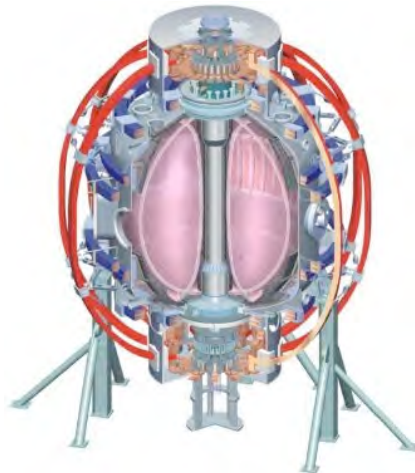


Fueling Systems

College W&M
Colorado Sch Mines
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CompX
General Atomics
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W. Blanchard

**NSTX Centerstack Upgrade Peer Review
LSB, B318
August 13, 2009**



Culham Sci Ctr
U St. Andrews
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ASIPP
ENEA, Frascati
CEA, Cadarache
IPP, Jülich
IPP, Garching
ASCR, Czech Rep
U Quebec

Fueling Systems

Overview

- * Mostly a relocation effort
- * Reproduce existing system with only a few minor modifications
 - Present system consists of:
 - * Gas delivery manifold
 - * Six equipment racks
 - * Four gas injection systems
 - three low field side injectors on outer vacuum vessel
 - fourth injection system that fuels from the lower dome and the midplane and shoulder of the centerstack

Fueling Systems

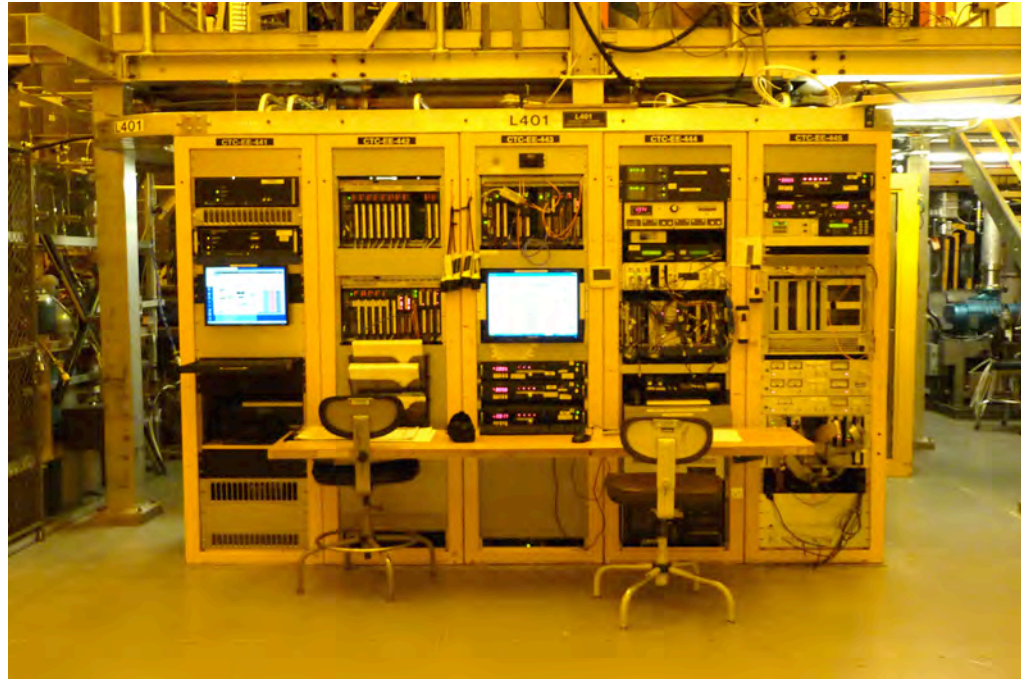
Gas Delivery Manifold



- * Presently located at the end of the pumpduct
- * Relocate system to a caged area in the south high bay area outside of the test cell
- * Add extra shielding around the TMB cage
- * Improved flexibility – will have ability to change gas on any injector during operations without test cell access

Fueling Systems

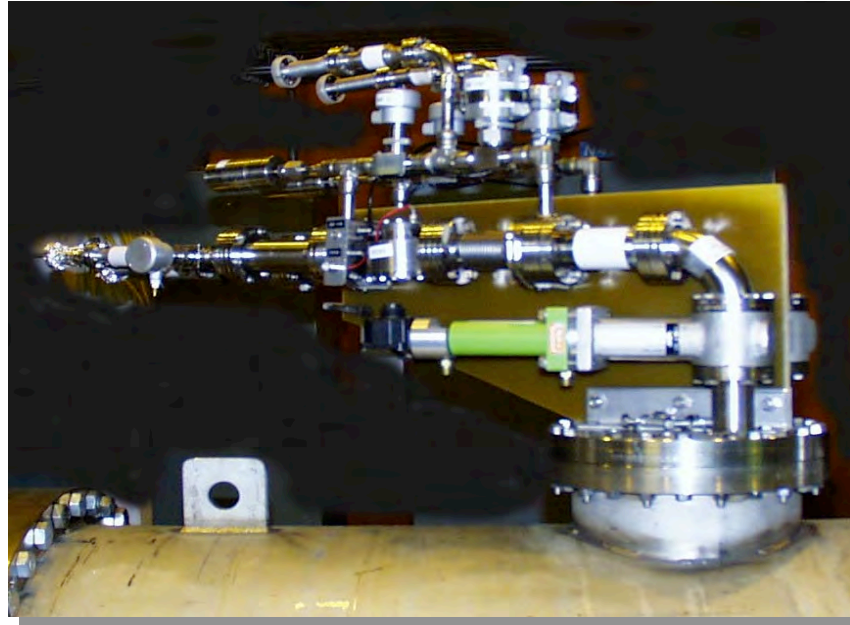
Equipment Racks



- * Used to control the vacuum, fueling and GDC systems
- * Presently located at the end of the pumpduct and on the platform
- * Relocate system to a caged area in the gallery

Fueling Systems

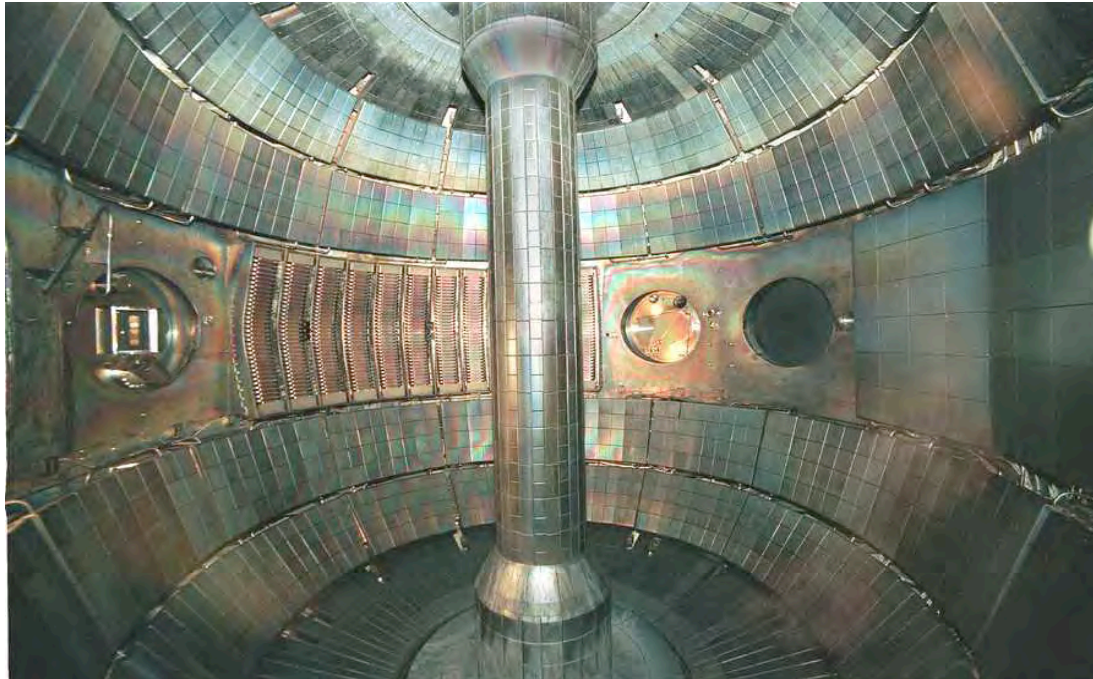
Low Field Side Gas Injection Assemblies



- * Bay K top gas injection assembly – no change
- * Two injectors on Bay J midplane will be re-installed on the new Bay J port cover
- * Fill volumes easily changed if required for longer pulses

Fueling Systems

Gas Injector #4



- * Lower dome injector is not used and will be removed
- * Lower divertor – no change
- * Duplicate in-vessel tubing runs behind graphite tiles to the centerstack midplane and shoulder for high field side fueling

Fueling Systems

Summary

- * Re-use nearly all of the existing equipment
- * Gas delivery system and equipment racks outside of the test cell
- * Duplicate existing system fueling capabilities with only minor changes