

NCSX Fueling Systems

W. Blanchard
WBS 21 Manager

FUELING SYSTEM

Requirements

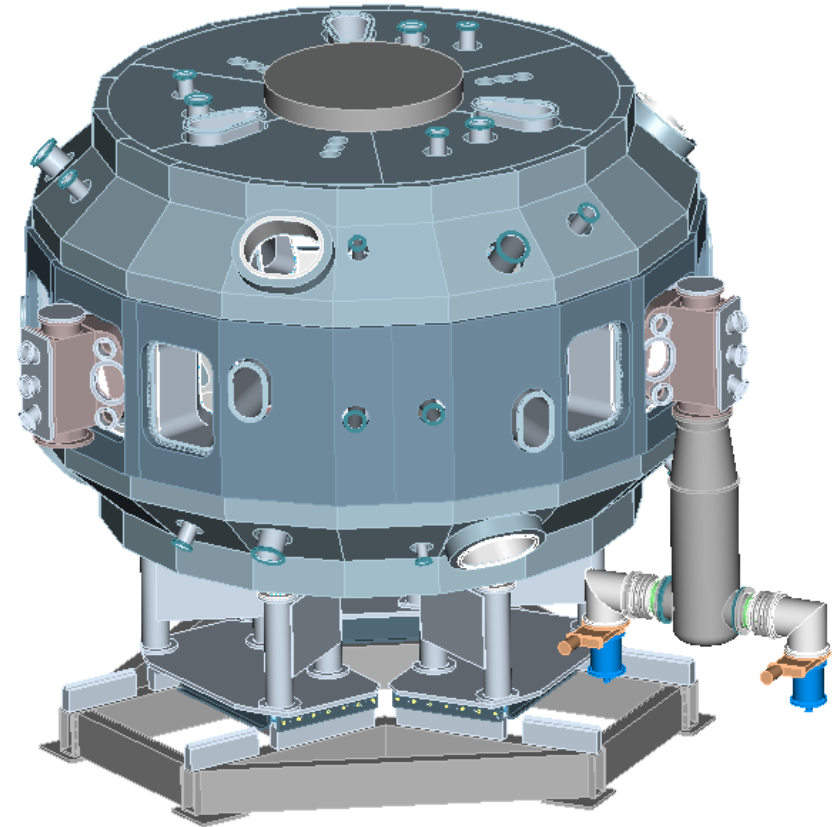
- Three gas injection systems with each injector having a maximum flow rate >50 T-l/s

Interfaces

- Injectors located at the three upper P12 port covers

Design Features

- Includes gas delivery manifold, pumpout system and gauging
- System monitored, controlled and interlocked using a PLC
- Pulse valve controlled from central computing



FUELING SYSTEM



Task ID	M\$	Hours									
		EVEM	EVBM	EVBB	EMTB	EASB	EEEM	EEBM	EEBB	ETTB	
Title I and II Design											
Preliminary Design / Management / Admin											
Engr Work Planning & Design		48									
Design Gas handling Hardware				96							
Design PLC Controls								112			
Drafting Support						24					
Final Design / Management / Admin											
Engr Work Planning & Design		88									
Design Gas handling Hardware				48							
Design PLC Controls								448			
Drafting Support (Electrical)						144					
Drafting Support (Mechanical)						68					
Subtotal Title I & II Design		136	0	144	0	236	560		0	0	
Title III											
Engr Work Planning & Design		40									
Fabricate & Install Hardware				120	240						
Fabricate & Install Hardware (Electrical)					288						
Install PLC Controls								192			
Integrated System Testing		40						80			
Materials and Supplies	\$	38,000									
Subtotal Title III	\$	38,000	80	0	120	528	0	272	0	0	

Cost Estimate

- * Based on NSTX costs for system which is similar to the proposed NCSX design
- * Input from engineers and personnel familiar with various parts of the project



FUELING SYSTEM



21 - Fueling Systems						
Job: 2101 - Fueling Systems-BLANCHARD						
211-101	Preliminary Design	42	03MAR09*	29APR09	318	40,631.36
211-105	PDR Fueling Systems	0		29APR09	318	0.00
211-109	Final Design	42	30APR09	29JUN09	318	120,756.40
211-113	FDR Fueling Systems	0		29JUN09	318	0.00
211-117	Title III	431	30JUN09	25MAR11	906	6,764.55
211-121	Procure Material and Supplies	65	01OCT09*	13JAN10	253	50,806.00
211-125	Fabricate and Assemble	115	01OCT10*	22MAR11	70	97,654.80
211-126	Test	5	23MAR11	29MAR11	70	21,609.20

em/em=48;em/sb=96
ea/sb=24; ee/em=112

em/em=38; ea/sb=212
ee/em=448; em/sb=48

EM/EM =40hr;

41=38\$K;

em/sb=120; em/tb=528
em/em=40; ee/em=192

em/em=40; ee/em=80

Project Schedule

Design in FY09, procurements in FY10 and fabrication/installation in FY11



FUELING SYSTEM



<u>Uncertainty of the Estimate</u>															
			<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Uncertainty Range (%)</u>	<u>Comments/Other Considerations</u>								
Design Maturity					X	-15%/+25%	There have been no design reviews therefore the design is not fixed.								
Design Complexity					X		Anticipated to only require standard components								
Other Comments:															

Risk Assessment: Low

Risk:

- * Equipment or component failure

Mitigation:

- * All components outside of coils and cryostat and easily replaceable
- * Standard equipment and hardware

