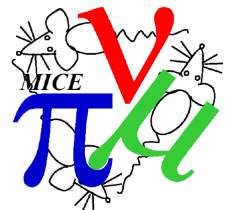


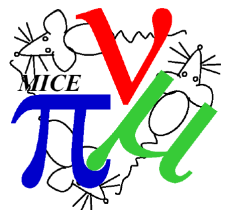
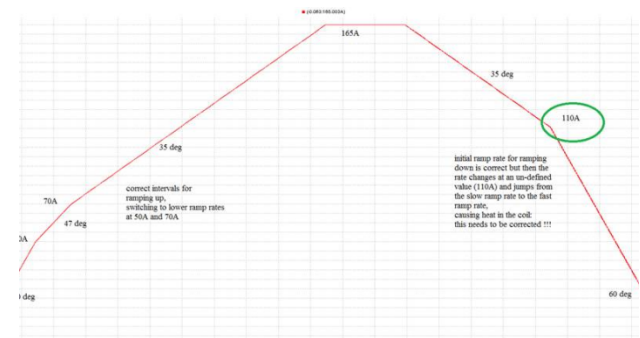
Status of the solenoid and focus coil magnets

J Boehm (February 2017)

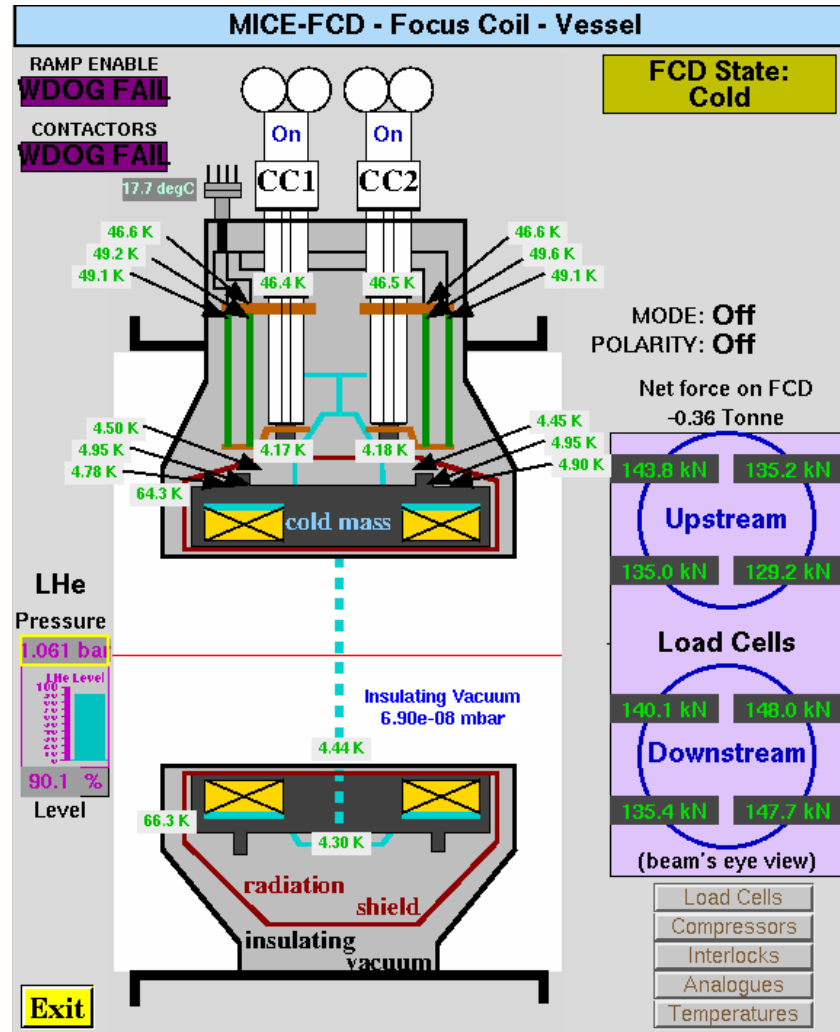


Focus coil

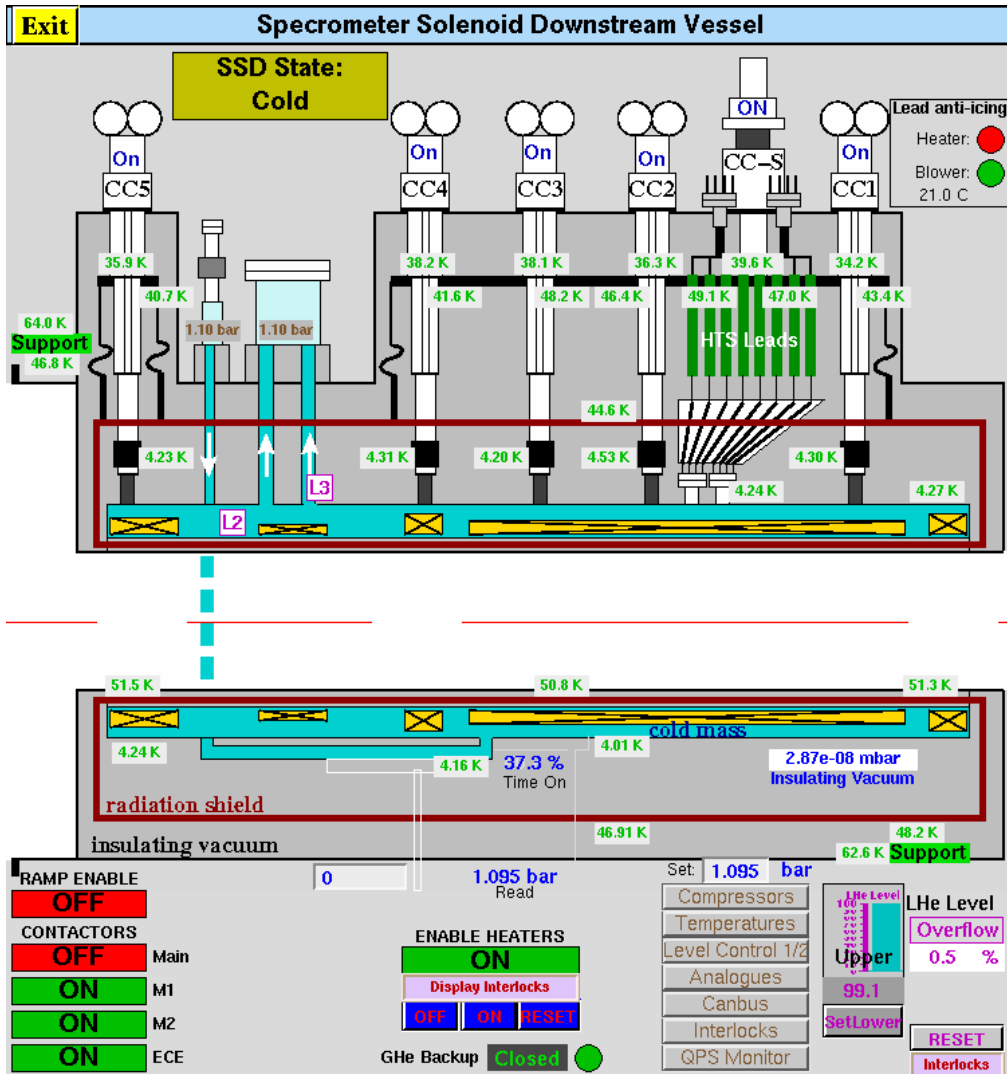
- FCD is cold, filled with helium and ready to be energised
- From previous test this magnet should be stable up to about 180A (design: 225A)
- Ramping is divided into three sections:
 - up to 50A: 25mA/s, up to 70A: 15mA/s, above 70A: 10mA/s
- At the lower ramping speed the cold heads are stronger than the eddy-current boil-off and pressure in helium can is falling
- Previous issue with sections during ramp-down (only two sections, switch-over at 110A) but this should have been fixed by Pierrick (not tested yet)
- Ramping of focus coil should now be possible from common magnet channel interface (not tested yet)
- Sequence of ramping is: first ramp solenoids, the ramp focus coil on the way up, and remove field of focus coil first on the way down



Load and temperature indicators on Focus Coil



Solenoid magnets



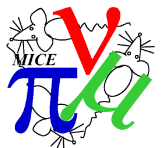
SSD:

- M1 dis-functional, M2 connected
- Trims not connected
- Cryogenically good now (>30%)

SSU:

- All coils except trims are connected
- Cryogenically very good (>50%)
- Had issue with M1 PSU in shorts (voltage set itself), extra step for cold-start now included in instructions and self-setting voltage is investigated

Had issues with WDOG errors stopping single stage compressors, this error also closed down the vacuum system: compressors have been disconnected from this controller network (CAN-Bus). Vac system proved to be stable and safe.



Common Magnet ramping interface

SSU Magnet Preset
MICE Channel Magnet Control
Exit

Set Channel
Init Channel
Ramp Channel ☐
TAG: StepIV-TestShorts

		SSU					FC	SSD				
		T2	C	T1	M2	M1	C	M2	C			
C D B	Vlim	5.0	16.0	5.0	7.0	7.0	11.0	7.0	16.0			
	Ilim	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			
	Rlim	0.0150	0.0300	0.0150	0.0300	0.0300	0.0300	0.0300	0.0300			
	Iset	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	Rate	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			
P S U	Vlim	5.0000 V	16.000 V	5.0000 V	7.000 V	7.000 V	11.000 V	7.000 V	16.000 V			
	Ilim	1.0000 A	1.000 A	1.0000 A	1.000 A	1.000 A	15.000 A	1.000 A	1.000 A			
	Rlim	0.0150 A/s	0.0300 A/s	0.0150 A/s	0.0300 A/s	0.0300 A/s		0.0300 A/s	0.0300 A/s			
	Stability	--	95.0 %	--	95.0 %	95.0 %	98.0 %	95.0 %	95.0 %			
	Iset	0.0000 A	0.000 A	0.0000 A	0.000 A	0.000 A	0.000 A	0.000 A	0.000 A			
	Rate	0.000 A/s	0.025	0.000 A/s	0.021	0.024	0.025	0.025	0.021			
	Ramp State		At Zero		At Zero	At Zero	Holding	nch Detected	nch Detected			
R E A D	DCCT Current	-0.03 A	0.00 A	0.00 A	0.00 A	0.08 A	-0.02 A	-0.03 A	-0.03 A			
	PSU Voltage	0.0000 V	0.000 V	0.0000 V	0.000 V	0.000 V	0.000 V	0.000 V	0.000 V			
	Diverging Ramp	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
	PSU Status	Reset <input type="checkbox"/>	Reset <input type="checkbox"/>	Reset <input type="checkbox"/>	Reset <input type="checkbox"/>	Reset <input type="checkbox"/>	<input type="checkbox"/>	Reset <input type="checkbox"/>	Reset <input type="checkbox"/>			
S E T	Set T2 Lims	Set C Lims					Set T1 Lims		Set M2 Lims		Set M1 Lims	
	Init SSU					Init FC					Init SSD	
	Ramp SSU <input type="checkbox"/>					Ramp FCD <input type="checkbox"/>					Ramp SSD <input type="checkbox"/>	
	SSU PSUs					FCD PSU					SSD PSUs	

SSU Enables

RAMP ENABLE

WDOG FAIL

Display Interlocks

OFF ON RESET

FC Enables

RAMP ENABLE

OFF

Display Interlocks

OFF ON RESET

SSD Enables

RAMP ENABLE

OFF

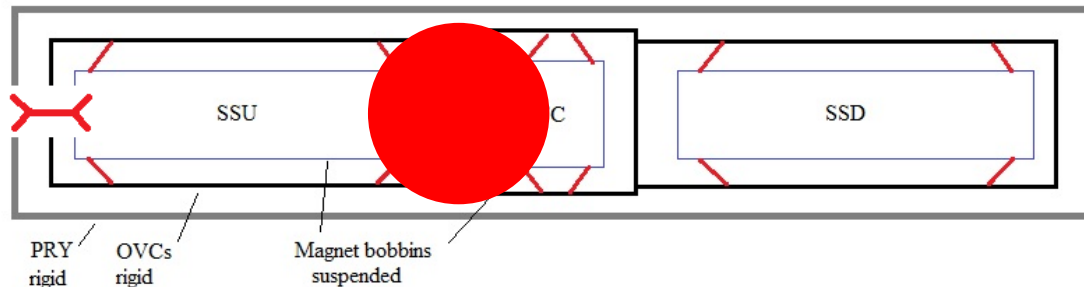
Display Interlocks

OFF ON RESET

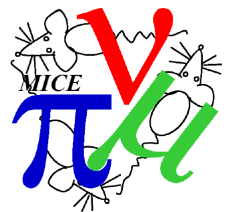
Tags are loaded into data base setting currents and ramp rates, magnet activation can then start. To ramp down we load a zero current (Step-IV-zero).



Polarity of fields important!

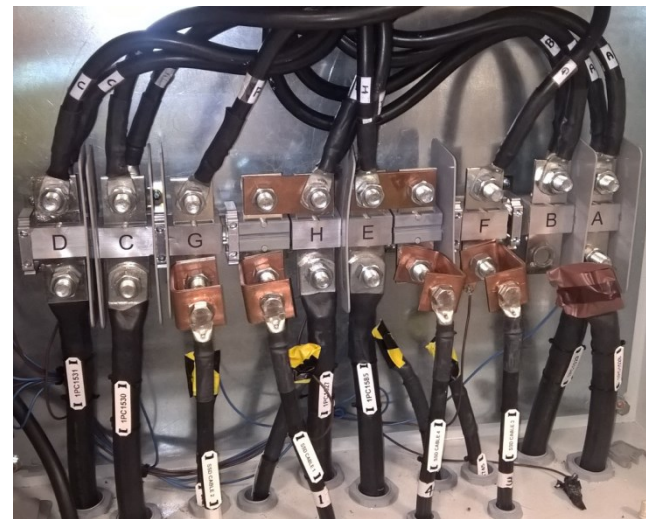
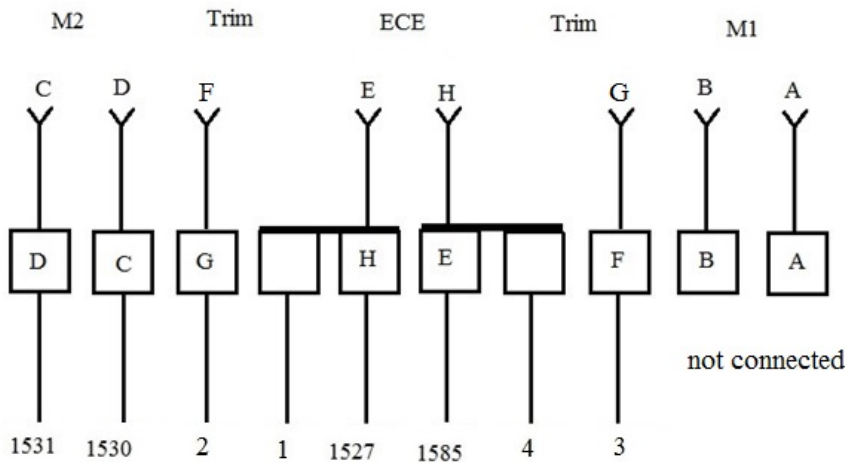


Magnetic flux direction needs to be verified. If magnetic forces between magnets are repulsive (as shown above) the attractive force between PRY and solenoid will see the addition of the repulsive force from FC → suspension of solenoid may break

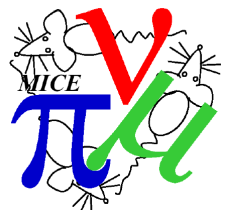


Polarity configuration

- A simple document now exists which describes the lay-out of the various configurations of polarity.
- The three Link boxes (mezzanine) now have windows which allow immediate information as to the configuration



SSD in reverse polarity mode



Outstanding issues

- (Decay solenoid is cold and at 200A, waiting to be ramped up again. Service on this unit has been delayed until after July)
- Check all magnet interfaces for functionality (eg ramp segments, ramping of FC, tidy up interface etc)
- Locate WDOG Error in Can-Bus
- With Pierrick not here Expert Knowledge needs to be more distributed (for both - magnets and cryogenics)

