

FOCUS COIL STATUS

OXFORD

V. Blackmore

J. Cobb

W. Lau

RAL

V. Bayliss

J. Boehm

T. Bradshaw

M. Courthold

R. Preece

J. Tarrant

M. Tucker

S. Watson

DARESBUURY

S. Griffiths

T. Hartnett

I. Mullacrane

A. Oates

P. Owens

C. White

MICE PPS
Searched Area
Entry Restricted.
Access by Permit to Work only

Contact
MICE Ops' Manager: 07789272992

THE LAST THREE WEEKS...

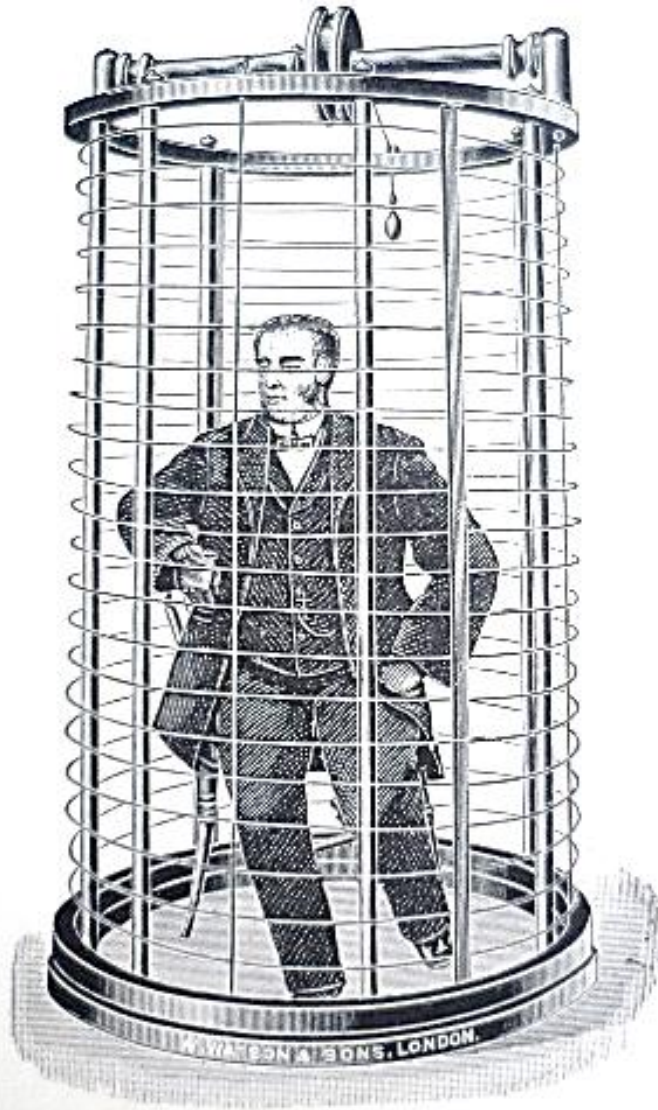


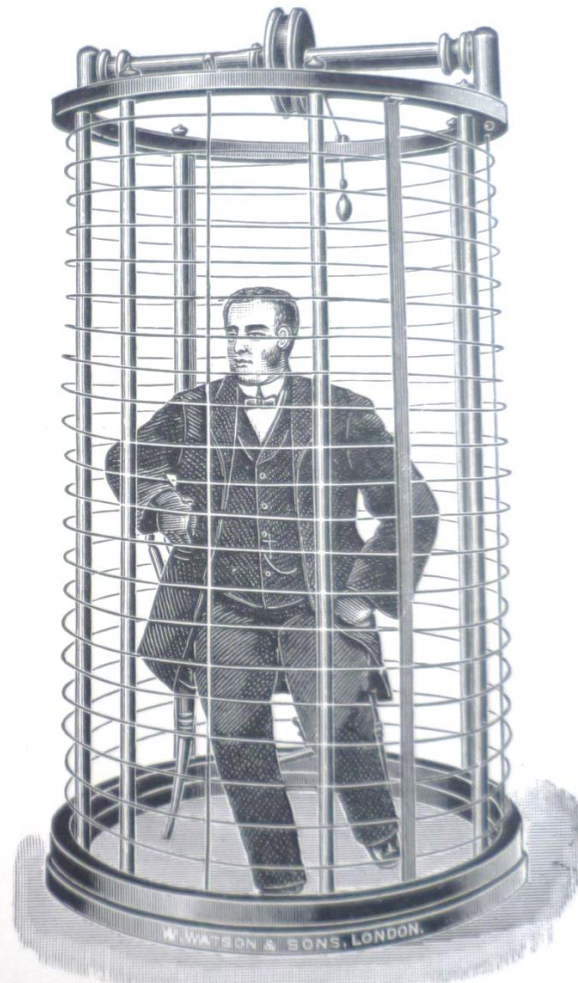
FIG. 290.—Medical Solenoid

Auto-Induction Treatment

cannot presume to say, but we may suggest that in this method of producing electric currents special electrical knowledge must be called in to calculate and design the capacity of the condensers and the self-induction of the solenoids to obtain the best effects from any given coil or generator; and further, as we cannot measure the current in the body—there are no external poles to which an instrument can be attached—we must arrange some means of indicating whether the solenoid is active or not, and to what extent. This can be done by arranging a secondary coil attached to a vacuum tube around the large solenoid. This will light up when the solenoid is active, and thus assure the practitioner that everything is working properly.

This induction of currents inside a solenoid excited by an oscillatory current can be beautifully illustrated by an experiment made by Professor J. J. Thomson, as shown in Fig. 291. If a glass bulb B, exhausted of its air to the point of maximum electric conductivity, is surrounded by a loop of wire P, connecting the outside of the two series of Leyden jars, it produces in the bulb a brilliant ring of light when the primary oscillations are

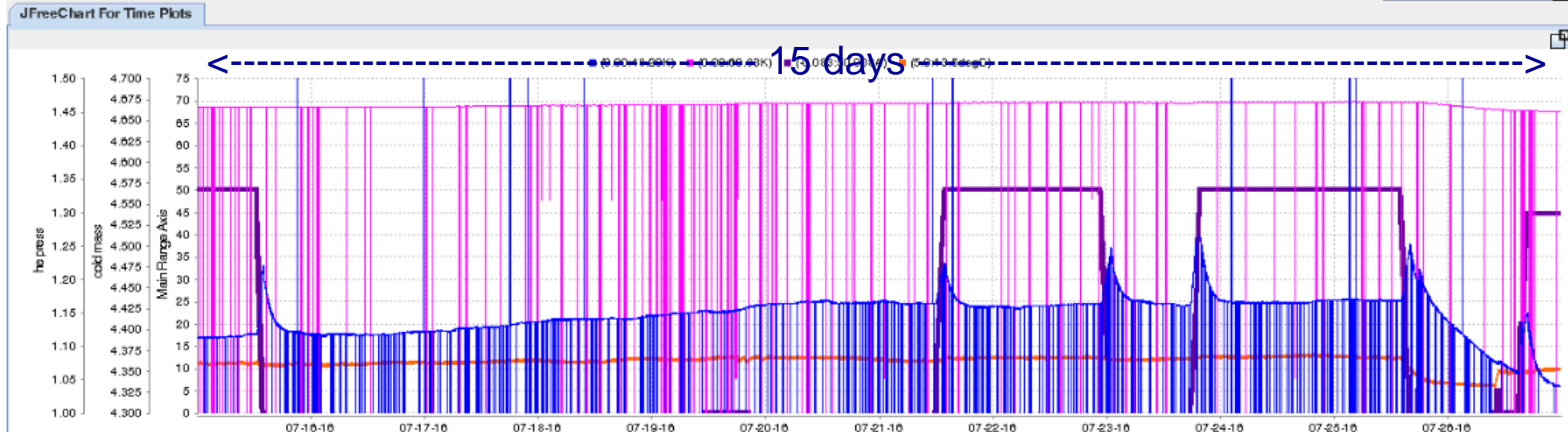
Circa 1903



THERMAL CONCERNS

MICE-FCD-TS-01:RDGK
MICE-FCD-TS-02:RDGK
MICE-FCD-TS-03:RDGK
MICE-FCD-TS-04:RDGK
MICE-FCD-PREG-01:RP
MICE-FCD-COIL-01:IMAG
MICE-FCD-ICE-01:RT

...
he press
Max 1.5
Min 1.0
Type normal left
Plot



FCD (aka FC1) slow to cool down

Slow drift up of CM & He temperatures

→ Ramping up / down injects heat

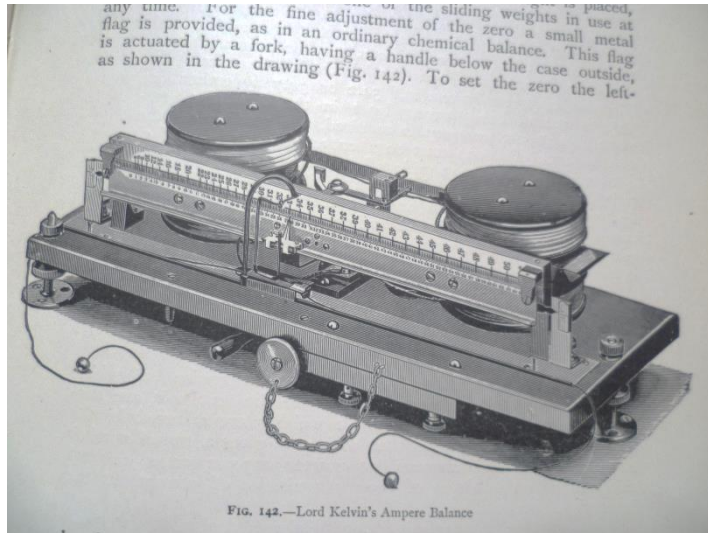
→ Running out of headroom – lose He if $p > 1.35$ bar

Fixed – dramatic improvement – by turning on 4th A/C unit in the Hell

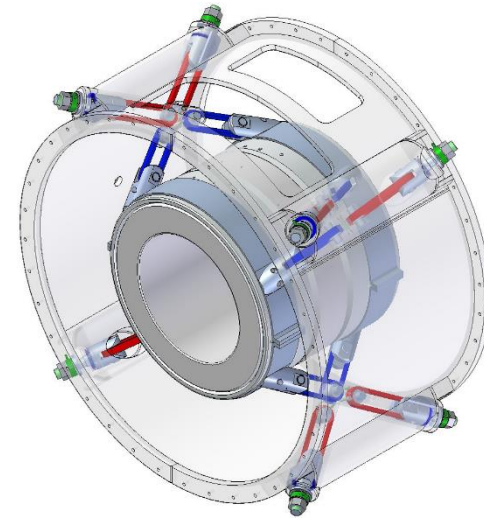
STANDALONE COMMISSIONING

- Interlock fault tripped PSU ~ once per 3 hours on average
 - Faulty pressure gauge
 - ~ 1 week to find but 10 minutes to fix
- Several extended alignment runs at ~ 50 Amps
- 90 Amp x 24 + hour soak in solenoid mode
 - Really only 20 to 25 % of full-throttle (225 A)
- Polarity change didn't change polarity...
 - Software found it
 - **Embarrassing**
 - *But attention to HPs allowed flip of SSD to be found*
 - » *FC defines field in both SSs*
- Basic operating instructions exist
 - ***Tested & verified by a couple of non-experts***

COMMISSIONING WITH SSs



1903

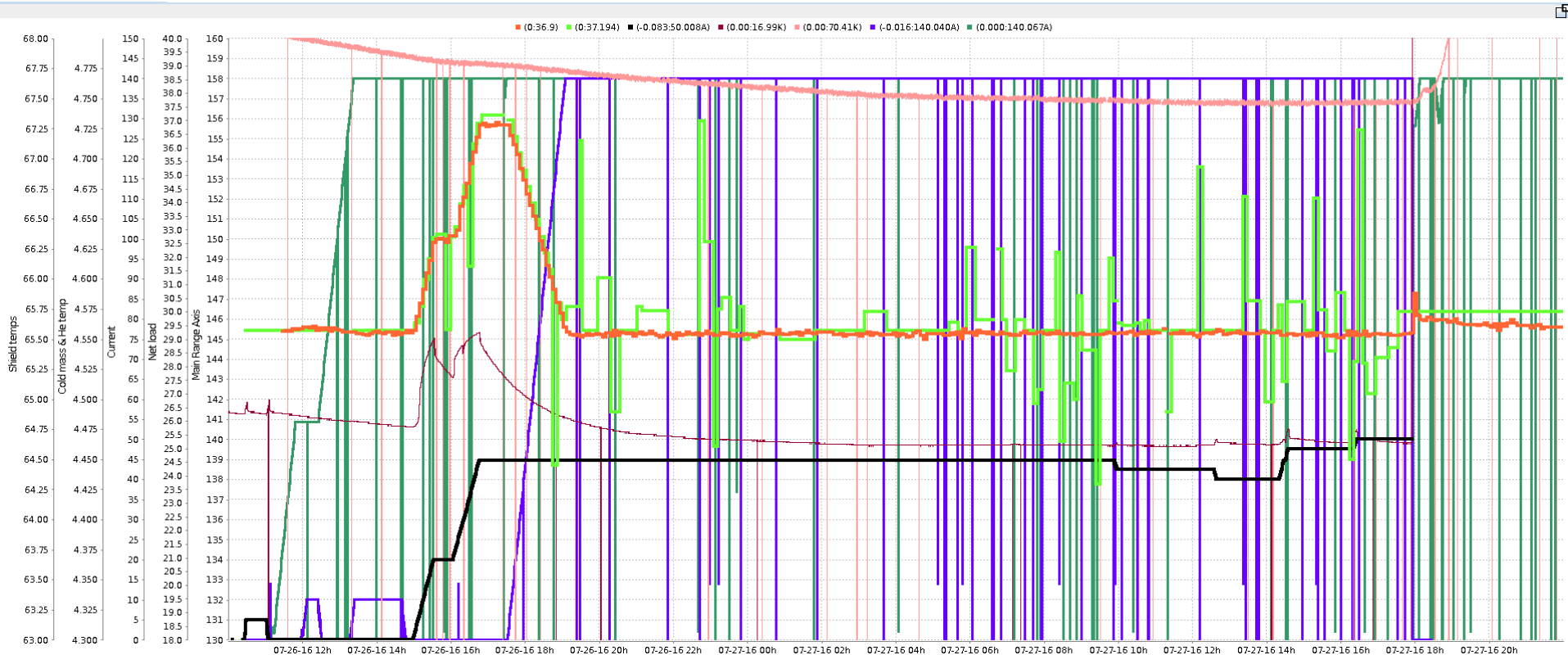


2016

- **Inter-module forces are the concern**
 - FC suspension designed for 90 tons axial force
 - Max force in any Step IV configuration ~ 30 tons
 - Should be OK... *Famous last words*
- **Load cell on each of (8) CM supports**
- ***Take it slowly and measure....***

SSU + FC + SSD 25 Jul y 2016

Ramp SSU to 140 A – Ramp FC to 45 A – Ramp SSD to 140 A



Green = I(SSU); Black = I(FC); Blue = I(SSD); Orange = Force, Light green = calculated. Force

Force = Sum (upstream load cells – downstream load cells)

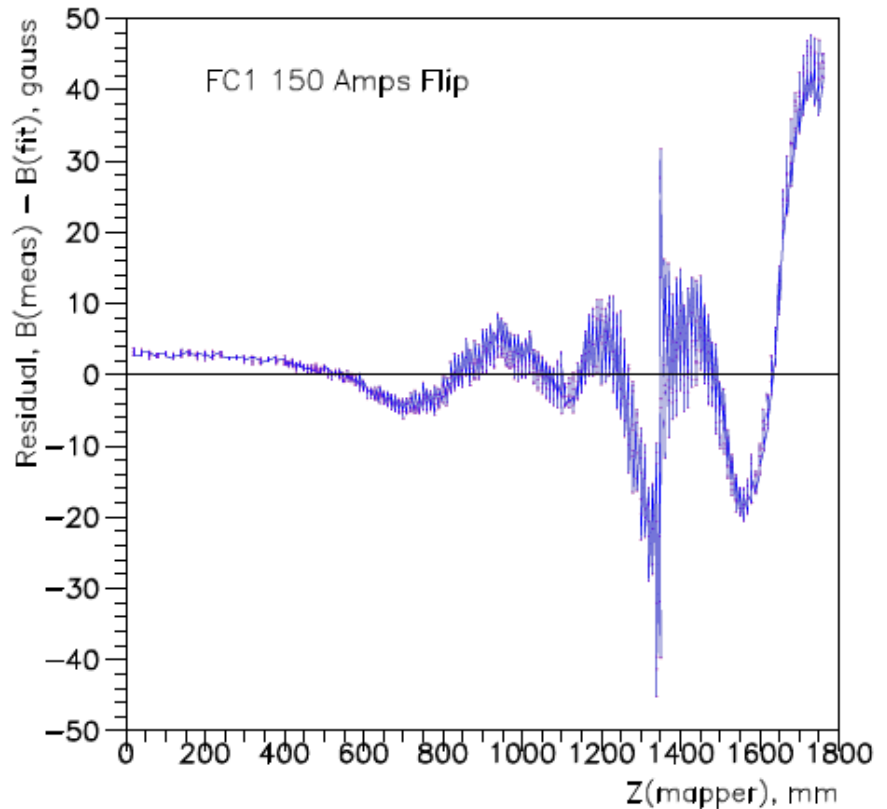
Forces agree with calculations; no obvious thermal problems, polarities OK
But max. force ~ 0.9 tons so only ~ 3% of the way

CONTROLS & MONITORING

- **Essential changes**
 - **Protection of PSU controls:**
 - **Alarmingly ‘live’ in PSU GUI**
 - **Could easily be changed by accident**
 - » **Consequences could be disastrous**
 - **Need:**
 - **“Are you sure:**
 - **that you want 5000 Amps ?**
 - **to open the contactor ?**
 - **etc.”**
- **Desirable**
 - **Fast data-logger**
 - **Some changes to Archiver frequencies**
 - **Fix the ‘dropouts’ (mainly aesthetics)**
- **Detailed list to be compiled**

MAPPING & COIL DIMENSIONS

- **Fit field mapper data**
 - Find dimensions of coils in FCs
 - Done for 100 & 150 Amps
 - Flip mode
 - FC1 and FC2
- **Consistent results**
 - But dominated by systematics
- **Results in MICE note 495**
- **Large residual for $z > 1550$ mm possibly due to safety window flange**



THE END