Observations during MD of June 2\textsuperscript{nd} to June 3\textsuperscript{rd}, 2010 and Future Plans for SPS Kickers

M.J. Barnes

TE/ABT/FPS
# SPS Kicker Summary

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MKE4</td>
<td>70+</td>
<td>9.1×10⁻⁸</td>
<td>MD of June 2-3 stopped three times to permit cool-down of MKE4s. No serigraphed magnets. Transition pieces installed.</td>
</tr>
<tr>
<td>MKE6</td>
<td>~37</td>
<td>9×10⁻⁷</td>
<td>Very high out-gassing: Ion pump VPIB_61635 went to “Not valid state” after MD of June 2-3. All 3 magnets serigraphed. Transition pieces installed.</td>
</tr>
<tr>
<td>MKP</td>
<td>~35</td>
<td>1.8×10⁻⁷</td>
<td>Significant out-gassing of the TIDVG, especially between 21:30hrs and 23:00hrs on June 2. VGPIB_11902 not working?? Transition pieces installed for 3 S-type modules.</td>
</tr>
<tr>
<td>MKDH1/2/3</td>
<td>No PT100</td>
<td>1.2×10⁻⁷</td>
<td>Laminated steel. No transition pieces.</td>
</tr>
<tr>
<td>MKDV1/2</td>
<td>~31 (MKDV1 &amp; 2)</td>
<td>1.1×10⁻⁷</td>
<td>Transition pieces on MKDV1 only.</td>
</tr>
<tr>
<td>MKQH</td>
<td>No PT100</td>
<td>1×10⁻⁷</td>
<td>Metallic stripes on ceramic. No transition pieces.</td>
</tr>
<tr>
<td>MKQV</td>
<td>No PT100</td>
<td>2.5×10⁻⁷</td>
<td>No transition pieces.</td>
</tr>
</tbody>
</table>
MKE4 & MKE6: Temperature & Vacuum of Worst Magnet

MKE4

Pressure in MKE4 41634 (maximum of 9.1e-8 mbar) is an order of magnitude less than in MKE6.

MKE6

High pressure in MKE6 (9e-7mbar in 61637) – as per week 17 MD. Note: 3 serigraphed magnets.
Pressure rise is an order of magnitude more than MKE4:
- Out-gassing of silver paint (serigraphy)?;
- Electron cloud? (Mauro to measure SEY).
Magnets appear to condition during MD;
Lowest pressure rise associated with kicker installed for longest period (61631). Not able to determine if “61631” out-gassing has reduced with time (61634 was previously 4E2 ferrite, with high out-gassing rate);
Ion pump VPIB_61635 went to “Not valid state” after this MD – maybe caused by high out-gassing?. To be investigated, by vacuum group, during short technical stop (today). Hot off the press: pump now OK.
## MKP: Vacuum

Pump (VPCIB_11902) close to TIDVG (11892) in “Not Valid” state, and has been for some time (not interlocked?): needs investigating.

### Plans & Ongoing Issues/Work

- **MKE4**: Shorten period of installation of 5 serigraphed MKE4 kicker magnets, from 3 to 2 shutdowns:
  - During 1st shutdown (end 2010, start 2011) replace one S-type & one L-type magnet;
    - spares of one S-type & one L-type (serigraphed) to be prepared in advance for exchange (1 S-type done);
  - During 2nd shutdown replace one S-type & two L-type magnets (~2 to 3 months reqd.);
    - spares of one S-type & one L-type (serigraphed) to be prepared in advance for exchange;
    - L-type ferrite prepared ready to exchange once L-type kicker is removed from machine (requires significant manpower (1 person year) and 100kCHF investment in hardware, e.g. to help automate pulse conditioning of 3rd magnet).

- **MKE6**
  - Ion pump in VPIB_61635 now OK (as of 24/06/2010);
    - Measure SEY for silver paint and ferrite (Mauro);
    - Measure out-gassing of silver paint when it is warmed up slightly;
    - Transverse impedance to be measured, in clean room, for non-serigraphed and serigraphed magnet (for 2nd spare magnet being prepared).

- **MKP**
  - Pump VPCIB_11902 (close to TIDVG and MKP1) MAY need replacing. Vacuum group has been asked to check pump at earliest opportunity [out-gassing from TIDVG is NOT good for MKPs!];
    - Longitudinal and transverse impedances currently being measured in clean room.

---

**June 24, 2010**

Barnes: SPSU SG