2008 Safety & Readiness Review Report

- Report finds that
  - *"preparations for the experiment are in good shape at this point: 3 months in advance of beam."*
- Report has a "*number of suggestions and a check-list of reminders*":

1. BEAMLINE - M. Jones
2. BEAM OPERATIONS - M. Jones
3. TARGET OPERATION - D. Crabb / O. Rondon
4. DETECTOR OPERATION - Temple - NSU - (NC A&T SU)
5. WORK PLANNING WITH OUTSIDE GROUPS - M. Jones
6. GENERAL SAFETY ISSUES - K. Slifer
7. RADIATION ISSUES - M. Jones

TARGET OPERATION

- 1) The target TOSP should include the list of current target experts.
  - Names for the TOSP period (now until run):
    - D. Crabb
    - D. Day
    - M. Seely
    - C. Keith
    - K. Slifer
    - J. Maxwell
    - J. Mulholland
    - S. Covrig
    - G. Smith
  - Other possible names: M. Jones, P. Bosted, O. Rondon, H. Baghdasayran
    - (Any LabView experts besides Donal, Karl, James and Jonathan?)

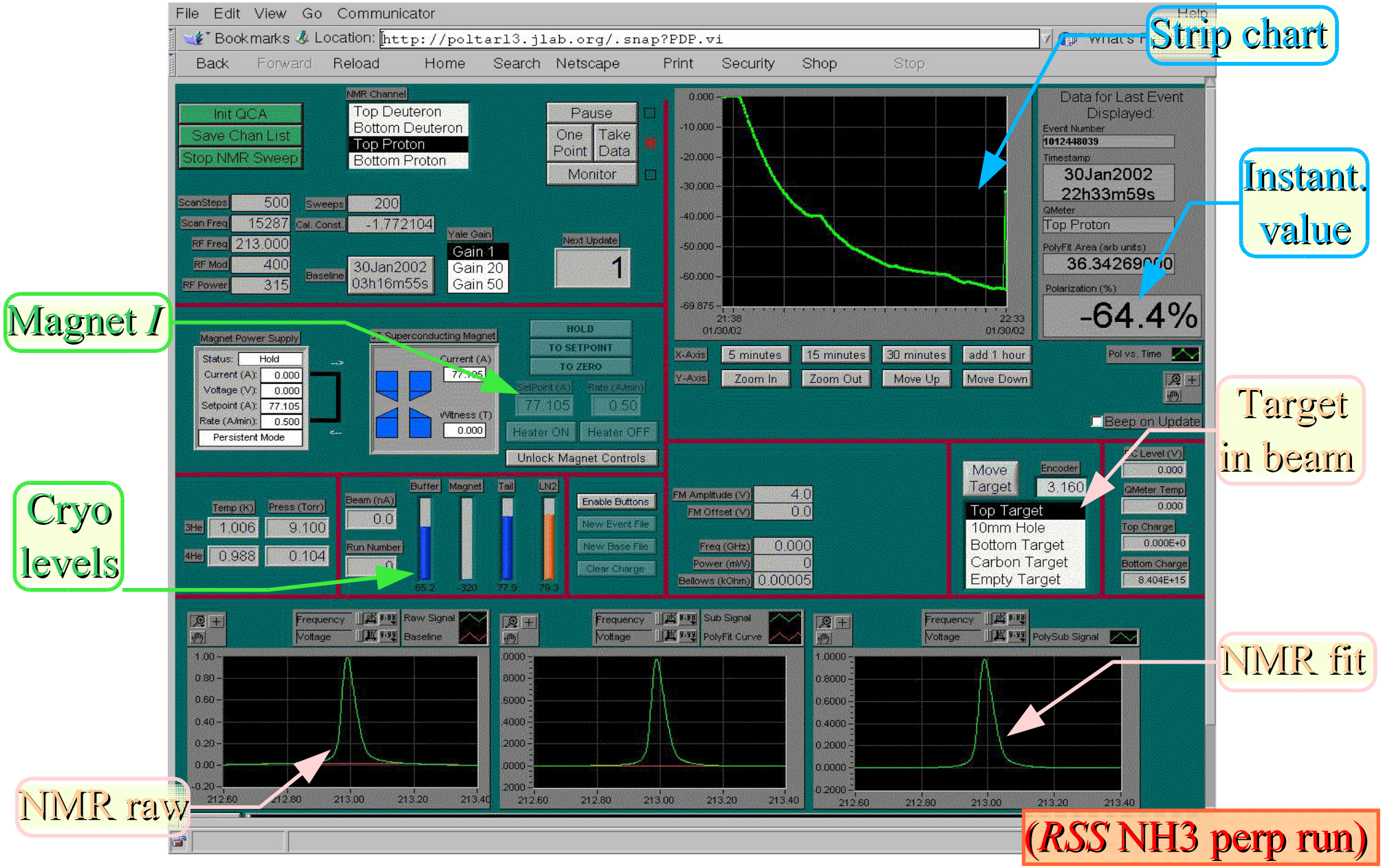
TARGET OPERATION

- 2) The collaboration's target group should provide a short-hand version of a target manual in the form of a "How To" list for operating the target. A copy of this list should be available in the Hall C counting house for the duration of the experiment(s) (it would be a good and quick reference for target operators). The version control of the list should be managed by a target expert.
  - We will have a document showing:
  - screen shot of the pol. targ. computers' control screen with items labeled
  - text instructions on :
    - things that need watching: polarization, which target is in beam, dates of baseline and *CC* constants being used, NMR gain setting(?), cryo fluid levels, ^{3}He and ^{4}He *T* and *P*, magnet current, witness field, etc.
    - how to move target (call MCC to mask/unmask, watch encoder, etc.)
    - how and when to adjust the microwave frequency

TARGET OPERATION

- 2) (*continued*)
  - text instructions on :
    - how and when change polarization sign
    - what to do if things happen: reboot frozen computer? call experts?
    - ...
  - Existing Target info on the Web
    - wiki http://hallcweb.jlab.org/experiments/sane/wiki/index.php/UVa_Polarized_Target
    - Polarized target cryo web page http://www.jlab.org/~ckeith/GEN/gen.html
  - recording of charge on target at fixed intervals (need to revive thecode that read the EPICs current and integrated it)
  - instructions on what to record in paper logbook
  - The expert in charge of the list: ?

TARGET OPERATION



TARGET OPERATION

- 3) Have a written plan for training target operators.
  - 1-2 hr demo sessions by expert(s) (name(s)?), with perhaps some hands on practice if the target is operational: how many sessions?, approximate dates?
  - Additional training sitting along a trained expert or operator when the beam is on: half a shift long?
- 4) Estimate the energy released in a quench and predict likely scenarios and mitigation strategies.
  - Refer to document detailing modifications to target after the 1998 repair, and to anecdotal evidence of quenches with no adverse effects, including recent one in EEL.

TARGET OPERATION

- 5) Estimate the effect of eddy currents induced by a magnet quench in nearby conductors and mitigate if necessary.
  - Reference to hclog reports of quenches during GEn98, Gen01 and RSS with no impact on sensitive SEM electronics located very close to the target.
  - See if effects on other nearby devices: forward tracker supports and PMTmagnetic shield box cherenkov PMT's, cherenkov tank(?) can be calculated.

TARGET OPERATION

- 6) Reserve enough time in the run plan for absolute calibration of the target polarization.
  - This is already included in the proposal beam time request
    - one shift for TE calibrations at beginning and end of each insert use
    - at least one intermediate TE
    - TE's during configuration changes / opportunistic beam off periods

	Data					Total
Energy - field angle	4.7 ||	4.7 80˚	5.9 80˚	5.9 ||	Config. change	
Run plan calendar days	**5**	**9**	**21**	**10**	**3**	
Run plan PAC hours	60	108	252	120		540
Proposal hours	70	130	200	100		500
Clock hours	120	216	504	240	72	1152
Target dose [e-] at 85 nA	1.1E+17	2.1E+17	4.8E+17	2.3E+17		1.0E+18
Target loads at 9E16 e- / load	1.3	2.3	5.4	2.5		11.5
Insert changes (2 loads/insert)	1	1	3	1		6
TE overhead hours (24 h / insert chan	16	32	72	24		144

TARGET OPERATION

- 7) Plan for irradiation of new target material
  - Cool down at UVA in August to select existing and possible newly NIST-irradiated material for run: we need a minimum of 4 cup loads that polarize to > 85% in the lab in < 1 hr.
  - Plan to use up to a shift and a half of beam at 1000 nA midway during commissioning to irradiate, followed by an anneal and TE to measure polarization with some accuracy after irradiation. A 12 h irradiation at 1000 nA would deliver a very uniform dose of ~2.7×10^{17} electrons/3.6 cm^2 raster area (this might be too a high dose for cold irradiation).
    - If this approach works, assuming we don't have enough material to begin with, we could use the calibrations at 1 μA to irradiate more material. The run plan includes 120 h of 1 μA calibration beam, so we could irradiate two full inserts to ~ 10^{17} /cm^2.
  - Contact Phil Cole about other possible irradiation options