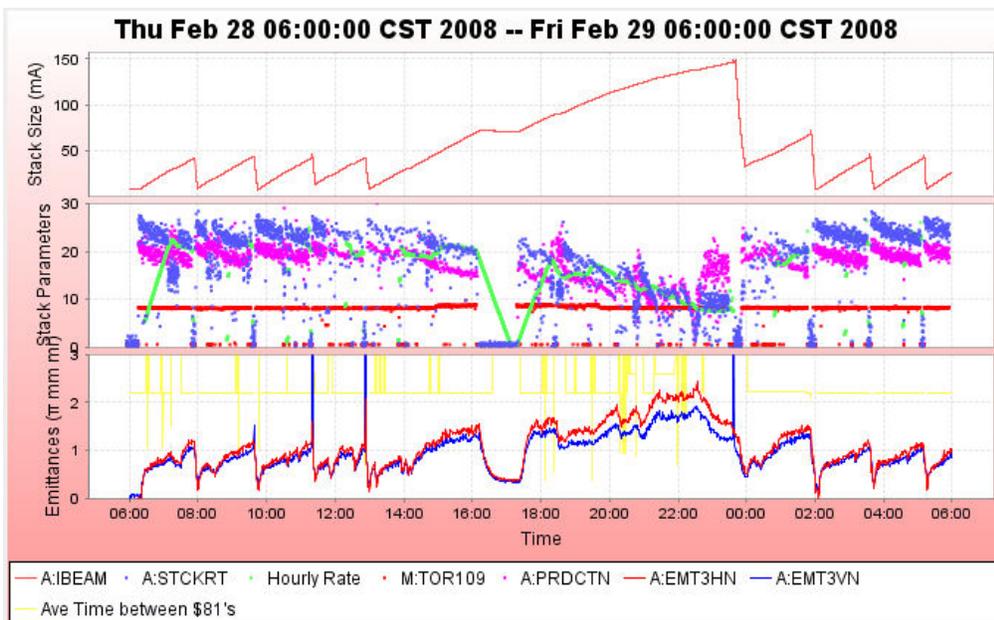


2008-02-29 Friday Morning Pbar Notes

Thursday, February 28, 2008
8:49 PM

Stacking

- Protons on target
 - We were running $7.5e12$ at 10 turns and $8e12$ at 11 turns.
 - Tried 11 turns for a few hours in the afternoon.
 - Ran 10 turns the rest of the time.
- Stacking Performance
 - Peak stacking hour was 23.93mA/hr
 - Average Production was 15.04 e-6/proton
 - Peak stack size was 145.9mA
- Stacking is still down a bit, and the lower production is a result of stacking to the larger stack size.
- The pulsed magnet voltage took an apparent step upward without a corresponding settings change. Ops adjusted the PMAG setting to bring it back into tolerance. Further investigation suggests that we may have an MADC readback problem and not a problem with the PMAG power supply. Experts will look into this further today.
- The Flusher was run starting at 90mA
 - Emittances improved when the flusher started.
 - The Flusher now increases the ARF2 voltage as the stack size increases. These increases helped emittances also.
 - In the future, we may also have the Flusher change the frequency limits.
- Vertical Damper
 - The vertical damper output increased with stack size.
 - We got up to about 100W at 150mA.
 - The amps should be able to handle this or a little more.
 - The vertical damper output also spikes during transfers.
 - To protect the amps, we had ops make a 3dB change to the attenuator during the transfers from the large stack.



Transfers

- Unstacked 400.2mA in 30 transfers over 1 sets.

- - Accumulator to MI efficiency was 96.5%
 - Accumulator to RR efficiency was 90%
- We had a couple of transfers under 90%. We'll take a closer look at the data today.

Column 1 Number_0_Pbar	Column 4 Number_3_Transfer Time	Column 21 Number_2 O_A:IBEAM B sampled	Column 22 Number_21_A:IB	Unstacked (mA)	Column 23 Number_22_R:BE	Column 24 Number_23_R:BE	Stashed	Acc to RR Eff	Column 27 Number_26_MI	Column 28 Number_27_MI Before	Acc to MI Eff	Acc to MI2 Eff	Transfers	Sets	
	2/29/2008	7:00:00 AM		400.197			360.20	90.00%	387.201	386.503	96.75%	96.58%	30	9	
7300	Friday, February 29, 2008	6:38:05 AM	40.388	11.388	29.000	216.877	242.060	25.18	86.84%	27.514	27.329	94.88%	94.24%	2	1
7299	Friday, February 29, 2008	5:10:56 AM	42.188	8.988	33.200	187.730	217.738	30.01	90.39%	32.129	31.882	96.77%	96.03%	3	1
7298	Friday, February 29, 2008	3:37:33 AM	42.988	8.388	34.600	156.508	188.369	31.86	92.08%	33.571	33.700	97.03%	97.40%	3	1
7297	Friday, February 29, 2008	1:53:34 AM	67.988	8.988	59.000	105.291	157.213	51.92	88.00%	56.767	56.814	96.22%	96.29%	4	1
7296	Thursday, February 28, 2008	11:41:54 PM	145.188	33.188	112.000	4.637	105.882	101.25	90.40%	109.652	109.292	97.90%	97.58%	7	1
7295	Thursday, February 28, 2008	12:54:18 PM	42.787	8.388	34.399	183.272	214.423	31.15	90.56%	33.374	33.202	97.02%	96.52%	3	1
7294	Thursday, February 28, 2008	11:21:41 AM	42.387	13.388	28.999	157.640	183.970	26.33	90.80%	27.788	27.764	95.82%	95.74%	2	1
7293	Thursday, February 28, 2008	9:39:55 AM	44.188	7.988	36.200	125.524	158.397	32.87	90.81%	35.005	35.303	96.70%	97.52%	3	1
7292	Thursday, February 28, 2008	7:54:42 AM	42.387	9.588	32.799	96.425	126.048	29.62	90.32%	31.401	31.217	95.74%	95.18%	3	1

Studies

- Increased cycle time/decreased intensity.
 - <http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=92&anchor=155719&hilite=15:57:19->
 - Ran a five second cycle time with 4e12 on target. Production efficiency only went as high as 24.
 - When this test was run in January, we were able to get productions as high as 26.
 - If the problem was related to one of the stochastic cooling systems, we would have expected the production numbers to still be good when going to the lower intensity, reduced cycle times.
 - It is unclear where our loss in stacking rate is coming from. Our reduced DRF-1 voltage (DRF1-3 has a dead PA in the tunnel) could still be part of the problem plus the target yield is down a few percent.
- Tuned up with lens gradient increased by 10%
 - <http://www-bd.fnal.gov/cgi-mach/machlog.pl?nb=pbar08&action=view&page=93&scroll=false&load=>
 - We normally run at 756 T/m.
 - Tuned up with the lens at 832 T/m, and ran for one stacking cycle.
 - Appears to be about a 2.7% increase in BPI10D and TGTCHK.
 - Increase in stacking is less clear due to a number of factors, but we did get our best hour during this period.
 - The measurement can be improved by using a 66 second supercycle instead of a 22 second supercycle as there will be less noise on the stack rate calculation.

Plan for Today & Upcoming Requests

- Today we will work on stacking
- Request for the Owl shift on Saturday:
 - Lens Gradient study.
 - Requires stable beam and a 66 second supercycle.
 - Change target position and run for one stacking cycle with lens at the nominal 756T/m gradient.
 - Next, increase lens gradient to 832 T/m and run for one supercycle.
 - Put lens gradient back to nominal.
- Access Request:
 - We currently don't have enough to request an access on our own, but if Booster vacuum or other issues give us extended downtime, we would go into the pbar rings.

- the pbar rings.
 - If we had one or two hours, we would go in and fix
 - DRF1-3
 - Un-stick the Accumulator vertical damper pickup (remember we may have difficulties going to large stack sizes until this is fixed).
 - A broken trombone.
 - If we had four hours we would install the Debuncher optical notch filters.
- Cooling Work Request: For next week.
 - Core transverse equalizers. Installation takes 30 minutes. Further discussion amongst experts is needed before we complete this change.
 - Debuncher Momentum Band 1 equalizer. We should be ready for this change early next week.
 - 1 hour of long cycle time cooling characterization before the work.
 - 1 hour to install the equalizer.
 - 1 hour of long cycle time cooling characterization after the work.

Other Notes

- Paul's Numbers
 - Most in an hour: 23.93 mA at Fri Feb 29 04:42:41 CST 2008
 - Best: 25.19 mA on 30-Jan-08
 - Average Production 15.04 e-6/proton Best: 25.41 e-6/proton on 01/30/2008
 - Average Protons on Target 6.92 e12 Best: 8.77 e12 on 07/24/2007
 - Largest Stack 145.90 mA Best: 313.58 mA on 02/18/2008
- Al's Numbers
 - Stacking
 - Pbars stacked: 387.46 E10
 - Time stacking: 21.90 Hr
 - Average stacking rate: 17.69 E10/Hr
 - Uptime
 - Number of pulses while in stacking mode: 33419
 - Number of pulses with beam: 29730
 - Fraction of up pulses was: 88.96%
 - The uptime's effect on the stacking numbers
 - Corrected time stacking: 19.48 Hr
 - Possible average stacking rate: 19.89 E10/Hr
 - Could have stacked: 435.54 E10/Hr
 - Recycler Transfers
 - Pbars sent to the Recycler: 369.91 E10
 - Number of transfers : 28
 - Number of transfer sets: 8
 - Average Number of transfer per set: 3.50
 - Time taken to shoot: 01.21 Hr
 - Time per set of transfers: 09.07 min
 - Transfer efficiency: 90.99%
 - Other Info
 - Average POT : 7.67 E12
 - Average production: 17.00 pbars/E6 protons