

# Vacuum: 12GeV Hardening

### Anthony DiPette Installation / Vacuum Group Leader 7/16/2015



### Vacuum: 12GeV Hardening

- Vacuum Improvements & Status
- Synchrotron Radiation Effects
- Vacuum Spares

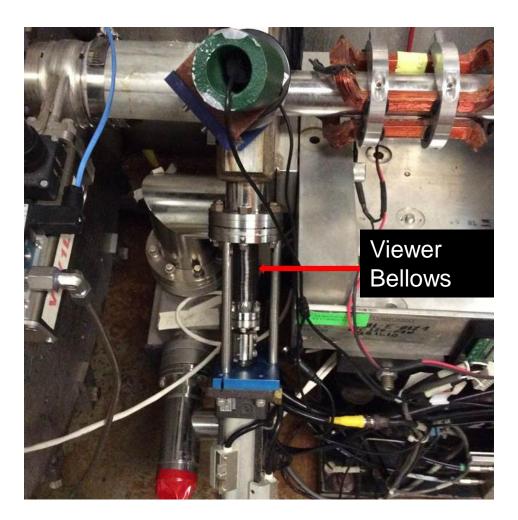




### **Vac Improvements - Linac Viewer Bellows**

### 9 of 11 Done

Viewer Location	New Bellows	
1L02		
1L06		
1L10	Done	
1L14	Done	
1L18	Done	
1L22	Done	
2L02	Done	
2L06	Done	
2L10	Done	
2L14	Done	
2L18	Done	







### **Vac Improvements - Air Lines**

- Air Lines changed from Poly to Copper
  - 100% Complete

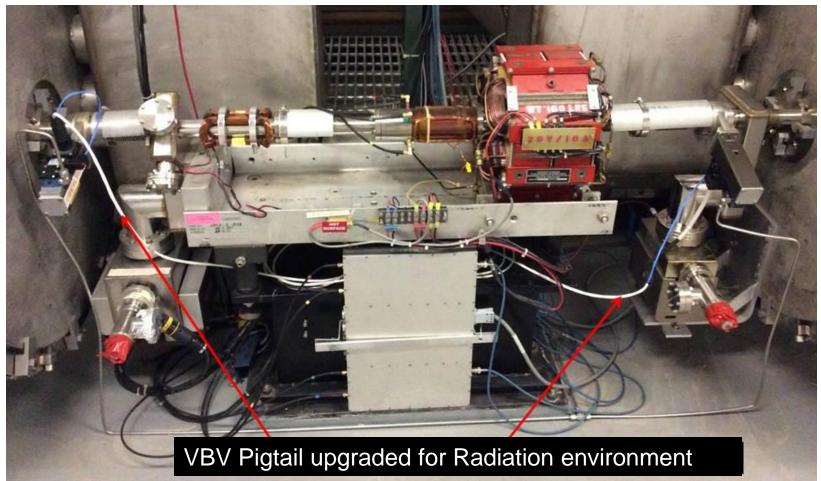






## Vac Improvements - VBV Pigtails

- New Connectors & Cables to replace Rad damage
  - 100% Complete North and South

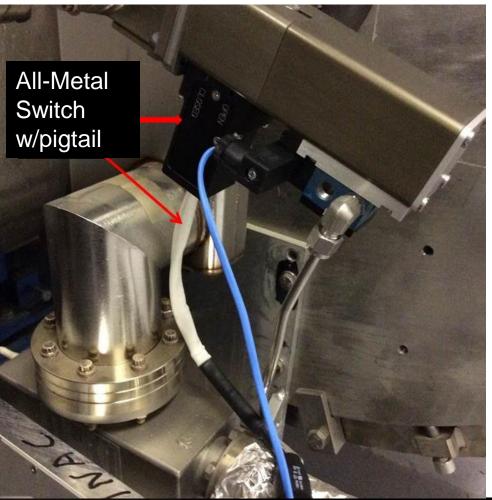






### **Vac Improvements - Position Switches**

- VBV Position Switches from Plastic to Metal
  - 41% Complete







### **Vac Improvements - Position Switches**

### VBV Position Switches from Plastic to Metal

#### Switches Replaced:

PreSAD	9	
SAD	32	
Total	41	
Remaining	59	\$38k

Position (A.B)         Replaced switches (A.B)         Metal Steve's Rad Survey List (A.B)         Mike's Dat Avg Radial (Me's Dat (A.S)         Mike's Dat Avg Radial (Me's Dat (Me's Dat (Me's Dat (Me's Dat (Max BL)         Replace during (Max BL)           2124         2124         1244         1230         2528         19964         30790         21.224           2123         2123A & B         2122         1244         18367         32617         46439         21.225           2123         2125A         2125         10241         37414         18387         32637         21.03 & B           1105         1105         84477         15458         11753         24932         11.05A & B           1121         1126         1126         84477         13791         17244         24900         112.26B           1121         7645         29922         10042         20304         112.1A & B         11.17 & A & B           2126         2126         6892         14864         11204         212.64 & B         21.14 & A & B           2126         2126         6892         14864         11204         212.64 & B         21.14 & A & B           1124         1124         6614         37020         11860         38074	VBV							
(A.B)         switches         Survey List         Avg Radial         Max Radial         Avg BL         Max BL         SAD 2015           2124         2124         2124         1430         25278         29167         46439         21248           2123         21.23A & B         21.23         10773         24127         10947         33016           21.03         21.25A         21.25         9280         18504         16101         22827         21.25B           11.05         11.05         8487         15458         17753         24932         11.05A & B           11.26         11.26A         11.26         8477         18791         17264         29000         11.27A & B           11.21         7645         29932         10042         20304         11.17A & B         21.16A & B           21.16         21.16A         11.26         6892         14864         11204         21.26A & A B         21.26A & A B           21.16         21.16A         11.24         6729         19440         10628         19989         11.24A & B           21.16         21.16A         11.24         6721         19440         10628         199898         11.24A & B	Position	Replaced						
21.24         21.24         14310         25828         18964         3070         21.24B           21.22         21.22B         21.22         12861         25578         29167         46439         21.22A           21.23         21.23A & B         21.23         10773         24127         10947         33016           21.03         10241         37414         18387         32537         21.03A & B           21.25         21.25A         21.25         9280         11656         464.3         321.22A           11.26         11.05         8487         15458         17753         24932         11.26A & B           11.27         7645         29930         17335         25834         21.17A & B           11.17         7645         29932         10042         20304         11.27A & B           21.18         21.06         6813         19565         7482         2771         21.68 & B           21.26         21.26         6813         19565         14824         2168         21.17A & B           21.16         21.16 (2164         21.16 (2164)         21.07A & B         21.17A & B         21.15A & B           21.12         5016         20212 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
21.22         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.23         21.25         92.80         185.94         16101         22.25         21.25         21.25         21.25         21.25         21.25         21.25         21.25         21.25         21.25         21.25         21.26         11.05         8487         15.55         17.55         24.932         11.05A & B           11.21         7645         29.932         10042         20.304         11.17A & B         11.27A & B           21.08         21.08         77.94         31405         15642         27668         21.08 & B           21.08         21.16         77.44         19.56         7482         27711         21.16 & B           11.24         11.24         6729         19440         10628         19989         11.24A & B           21.15         6614         37020         118503         13506         28183         11.11A & B           21.02         5346         16099         15090         25201								
2L23         2L23         2L23         10773         24127         10947         33016           2L03         10241         37414         18387         32537         2L26A         B           2L25         2L25A         2L25         9260         118504         16101         22827         2L25B           1L26         1L26A         1L26         8477         15791         17264         29080         1L26B           1L21         7744         25107         13095         27244         1L27A & B           1L17         7645         29932         10042         20304         1L17A & B           2L11         7645         29932         10042         2140         2L26B         2108 B           2L26         2L26         6683         19658         7482         23711         2L16B           2L14         5717         15853         13506         28183         1114 & B           2L07         5474         1225         15625         35212         2L07A & B           2L02         5346         16099         13738         28189         2L12A & B           1L12         1112         4935         33561         5925         20511								
2L03         2L25         2L255         2L25         2L25         2L25         2L25         2L25         2L26         2L26         2L26         2L35         2L35         2L35         2L35         2L35         2L35         2L35         2L35         2L35         2L36         2L36         2L36         210042         20304         1L27A & & & & & & & & & & & & & & & & & & &								2L22A
21.25         21.25A         21.25         9280         18504         16101         22877         21.25B           1L05         1L05         8487         15458         17753         24932         1L05A & B           1L26         1L26A         1L26         8477         18791         17254         29080         1L26B           1L21         7744         25107         13095         27204         1L21A & B           1L17         7645         29932         10042         20304         1L17A & B           2L11         7515         39940         7335         25834         2L10A & B           2L26         2L26         6892         14464         11204         2120A & A B           2L15         2         6614         37020         11860         38074         2L15A & B           1L11         5717         15853         13506         28183         1L11A & B         2L07 & A B           2L02         5744         12255         15525         35212         2L07A & B         2L07A & B           2L02         5164         21710         13738         25189         2L12A & B         1114 & B           1L12         1L12         4935		2L23A & B	2L23					
11.0511.058.48715.45817.7532493211.05A & B11.2611.26A11.268.47718791172642903011.26B11.21774425107130952720411.21A & B11.17764529932100422030411.17A & B21.1621.06A773431405156422766821.08 &21.2621.06A21.26A68031965874822377121.16B11.2411.24677919440106281999811.24A & B21.1511.24661437020118603807421.5A & B21.1621.16A21.1668131965874822377121.16B11.2411.24677919440106281999811.24A & B21.15517715853135062818311.11 & & B21.07547412225156253521221.07A & B21.08534616099150002520121.0950162022852651822611.124930326881118102961111.1311.1346571480775332142111.144330326881118102961111.14439013698110453176611.1442889416119134566611.14380911576115134707711.032252749154042270421.15<								
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1L17       7645       29322       10042       20304       1L17A & B         2L11       7515       39940       7335       25834       2L11A & B         2L08       2L08       7235       25834       2L11A & B         2L16       2L08       2L26       6892       14864       11204       21240       2L26A & B         2L16       2L16A       2L16       6813       19658       7482       23771       2L16B         1L24       6729       19440       10628       19999       1L24A & B         2L15       6614       37020       11860       28074       2L15A & B         2L07       5474       12225       15625       35212       2L07A & B         2L06       5164       21334       14594       31348         2L12       5054       27510       13738       25189       2L12A & B         1L12       1L12       4935       33561       5925       20519       1L12A & B         1L13       1L13       4657       14807       7533       21421       1L1A & B         1L13       1L13       4657       14807       7533       21421       1L1A & B         1L14       3		1L26A	1L26					
2L11         7515         39940         7335         25834         2L11 & & B           2L08         2L08A         7294         31405         15642         27668         2L08 B           2L16         2L16A         2L16         6813         19658         7422         23771         2L168 B           1L24         1L24         6614         37020         11860         38074         2L15A & B           2L15         6614         37020         11860         38074         2L15A & B           2L07         5474         1225         15625         35212         2U07A & B           2L02         5346         16099         15090         25201         1114 & B           2L02         5346         16099         15090         25201         112A & B           1L12         5016         20928         5265         18226         112A & B           1L12         4930         32688         11810         29611         1112A & B           1L13         1L13         4657         14807         7533         21421         113A & B           1L14         3809         1156         11753         47077         1148         11453         36347 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
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2L26         2L26         6892         14864         11204         21240         2L26A & B           2L16         2L16A         2L16         6613         19658         7482         23771         2L6B           1L24         1L24         6614         37020         11860         38074         2L15A & B           2L15         6614         37020         11860         38074         2L15A & B           2L07         53747         15853         13506         28183         1L11A & B           2L02         5346         16099         15090         25201         2L07A & B           2L02         5364         20928         5265         18228         1113           1L12         1L12         4935         33561         5955         20519         1L12A & B           1L12         1L12         4935         33561         5955         20519         1L12A & B           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L14         4330         32688         11045         31768         3164           1L13         4459         18698         11045         36347         1113      <		01.00.4						
2L16         2L16A         2L16         6613         19658         7482         23771         2L16B           1L24         1L24         6729         19440         10628         19998         1L24A & B           2L15         6614         37020         11860         38074         2L15A & B           1L11         5717         15853         13506         28183         1L11A & B           2L07         5346         16099         15090         25201           2L06         5164         21334         14594         31348           2L12         5016         20928         5265         18226           1L12         1L12         4930         32668         11810         29611           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L10         4459         18698         11045         3654         14807         7533         21421         1L13A & B           1L14         3806         11173         6264         28979         1414         1459         16065           1L24         3207         16328         9416         11913         45666         1414         14598		2L08A	01.00					
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2L15         6614         37020         11860         38074         2L15A & B           1L11         5717         15853         13506         28183         1L11A & B           2L07         5346         16099         15090         25201           2L06         5164         21334         14594         31348           2L12         5054         27510         13738         25189         2L12A & B           1L02         5016         20928         5265         18226         1112         1L12A & B           1L12         1L12         4930         32688         11810         29611         1113A & B           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L14         4930         32688         11045         31768         1114           1L14         4459         18698         11045         31768         1114           1L14         3809         11576         11513         47077         1409         3664         11913         45666           1L14         3809         11576         11513         47077         1409         3624         2204         2214         22141		2L16A						
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2L07         5474         12225         15625         35212         2L07A & B           2L02         5346         16099         15090         25201           2L06         5164         21834         14594         31348           2L12         5054         27510         13738         25189         2L12A & B           1L02         5016         20928         5265         18226           1L12         1L12         4935         33561         5925         20519         1L12A & B           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L14         4459         18698         11045         31768           2L21         4311         16005         10765         36347           1L18         4288         9416         11913         45666           1L14         3809         11576         11513         47077           1L03         3674         8719         11798         25852           1L23         1L23         2552         7491         5404         22704           1L33         2         16229         6646         28138         2214								
2L02         5346         16099         15090         25201           2L06         5164         21834         14594         31348           2L12         5016         27510         13738         25189         2L12A & B           1L02         5016         20928         5265         18226           1L12         1L12         4935         33561         5925         20519         1L12A & B           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L10         4459         18698         11045         31768           2L21         4311         16005         10765         36347           1L18         4288         9416         11913         45666           1L14         3809         11576         11513         47077           1L09         3664         8719         11798         25852           1L23         1L23         2952         16929         6646         28138           2L18         2307         6815         8890         23024           2L14         2307         6815         8890         23024           2L05         2252								
2L06         5164         21834         14594         31348           2L12         5054         27510         13738         25189         2L12A & B           1L02         5016         20928         5265         18226           1L12         1L12         4935         33561         5925         20519         1L12A & B           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L10         4459         16688         11045         31768           2L21         4311         16005         10765         36347           1L18         4288         9416         11913         45666           1L14         3809         11576         11513         47077           1L09         3806         11173         6264         28979           1L22         3321         18218         5973         23824           1L23         1L23         2552         7491         5404         22704           1L24         2307         6815         8890         23024         2204           2L18         2252         7469         7642         23682         11151         13798								2L07A & B
2L12         5054         27510         13738         25189         2L12A & B           1L02         5016         20928         5265         18226           1L12         1L12         4935         33561         5925         20519         1L12A & B           1L13         1L12         4935         33561         5925         20519         1L12A & B           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L10         4459         18698         11045         31768           2L21         4311         16005         10765         36347           1L14         3809         11576         11513         47077           1L09         3806         11173         6264         28979           1L22         3321         18218         5973         23824           1L23         2952         16929         6646         28138           2L14         2307         6815         8890         23024           2L13         2252         7491         5404         22662           2L14         2307         6815         8890         23024           2L14								
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1L19         4930         32688         11810         29611           1L13         1L13         4657         14807         7533         21421         1L13A & B           1L10         4459         18698         11045         31768           2L21         4311         16005         10765         36347           1L18         4288         9416         11913         45666           1L14         3809         11576         11513         47077           1L09         3806         11173         6264         2879           1L23         3674         8719         11798         25852           1L23         1L23         2952         16929         6646         28138           2L18         2252         7491         5404         22704           2L14         2307         6815         8890         23024           2L14         2037         6815         8890         23024           2L14         2307         6815         8409         23812           1L25         1L25         2212         9837         1983         13798           2L05         125         2145         110732         28415 <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
1L13         1L13         4657         14807         7533         21421         1L13A & B           1L10         4459         18698         11045         31768           2L21         4311         16005         10765         36347           1L18         4288         9416         11913         45666           1L14         3809         11576         11513         47077           1L09         3666         11173         6264         28979           1L03         3674         8719         11798         2582           1L22         3321         18218         5973         23824           1L23         1L23         2952         16929         6646         28138           2L18         2552         7491         5404         22704           2L13         2417         8782         6399         18516           2L14         2307         6815         8890         23024           2L05         2252         7469         7642         23682           1L25         1L25         2212         9837         1983         13798           2L20         2184         11635         8409         23812			1L12					1L12A & B
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1L18       4288       9416       11913       45666         1L14       3809       11576       11513       47077         1L09       3806       11173       6264       28979         1L03       3674       8719       11798       25852         1L22       3321       18218       5973       23824         1L23       1L23       2952       16929       6646       28138         2L18       2552       7491       5404       22704         2L13       2417       8782       6399       18516         2L14       2307       6815       8890       23024         2L05       2252       7469       7642       23682         1L25       1L25       2212       9837       1983       13798         2L06       2184       11635       8409       23812         1L06       1L06       2116       7138       10732       28415         1L12       1983       3678       12370       21459         1L16       1147       4060       4896       20528         2L19       1263       6802       7795       30006         1L15       1372<								
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1L09       3806       11173       6264       28979         1L03       3674       8719       11798       2582         1L22       3321       18218       5973       23824         1L23       1L23       2952       16929       6646       28138         2L18       2552       7491       5404       22704         2L13       2417       8782       6399       18516         2L14       2307       6815       8890       23024         2L05       2252       7491       7469       7642       23682         1L25       1L25       2212       9837       1983       13798         2L20       2184       11635       8409       23812         1L06       1L06       2116       7138       10732       28415         1L07       2098       7347       4277       24006         1L16       1372       2776       5760       21597         1L15       1372       2776       5760       21597         2L19       1263       6802       7795       30006         1L16       1147       4060       4896       20528         2L10								
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2L13       2417       8782       6399       18516         2L14       2307       6815       8890       23024         2L05       2252       7469       7642       23682         1L25       1L25       2212       9837       1983       13798         2L20       2184       11635       8409       23812         1L06       1L06       2116       7138       10732       28415         1L07       2098       7347       4277       24006         1L20       1958       3678       12370       21459         1L15       1372       2776       5760       21597         2L19       1263       6802       7795       30006         1L16       1147       4060       4896       20528         2L10       1118       8771       830       6414         1L08       990       6142       7024       31234         2L17       2L17A       870       1712       4880       12489         1L04       248       1075       3528       17874         2L09       88       200       245       857			1L23					
2L14         2307         6815         8890         23024           2L05         2252         7469         7642         23682           1L25         1L25         2212         9837         1983         13798           2L20         2184         11635         8409         23812           1L06         1L06         2116         7138         10732         28415           1L07         2098         7347         4277         24006           1L20         1958         3678         12370         21459           1L15         1372         2776         5760         21597           2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
2L05         2252         7469         7642         23682           1L25         1L25         2212         9837         1983         13798           2L20         2184         11635         8409         23812           1L06         1L06         2116         7138         10732         28415           1L07         2098         7347         4277         24006           1L20         1958         3678         12370         21459           1L15         1372         2776         5760         21597           2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
1L25     1L25     2212     9837     1983     13798       2L20     2184     11635     8409     23812       1L06     1L06     2116     7138     10732     28415       1L07     2098     7347     4277     24006       1L20     1958     3678     12370     21459       1L15     1372     2776     5760     21597       2L19     1263     6802     7795     30006       1L16     1147     4060     4896     20528       2L10     1118     8771     830     6414       1L08     990     6142     7024     31234       2L17     2L17A     870     1712     4880     12489       1L04     248     1075     3528     17874       2L09     88     200     245     857								
2L20         2184         11635         8409         23812           1L06         1L06         2116         7138         10732         28415           1L07         2098         7347         4277         24006           1L20         1958         3678         12370         21459           1L15         1372         2776         5760         21597           2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
1L06         1L06         2116         7138         10732         28415           1L07         2098         7347         4277         24006           1L20         1958         3678         12370         21459           1L15         1372         2776         5760         21597           2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857			1L25					
1L07         2098         7347         4277         24006           1L20         1958         3678         12370         21459           1L15         1372         2776         5760         21597           2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
1L20         1958         3678         12370         21459           1L15         1372         2776         5760         21597           2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857			1L06					
1L15       1372       2776       5760       21597         2L19       1263       6802       7795       30006         1L16       1147       4060       4896       20528         2L10       1118       8771       830       6414         1L08       990       6142       7024       31234         2L17       2L17A       870       1712       4880       12489         1L04       248       1075       3528       17874         2L09       88       200       245       857								
2L19         1263         6802         7795         30006           1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
1L16         1147         4060         4896         20528           2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
2L10         1118         8771         830         6414           1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
1L08         990         6142         7024         31234           2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
2L17         2L17A         870         1712         4880         12489           1L04         248         1075         3528         17874           2L09         88         200         245         857								
1L04         248         1075         3528         17874           2L09         88         200         245         857		01.474						
2L09 88 200 245 857		2L1/A						
2L04 32 230 159 1202								
	2L04			32	230	159	1202	

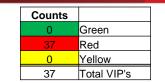




## Vac Improvements – VIP's

- VIP Recovery
  - Goal is 100%
  - Status @ SAD Start

VIP	Problem	Status
3A17	Pump Shorted	Red
4S00B	Railed	Red
4S01A	Railed	Red
4S03A	Railed	Red
4S00C	Railed	Red
BS00	Clean High Volt Feed through. Install pwr supplies	Red
3S02	Clean High Volt Feed through. Install pwr supplies	Red
9S01	Clean High Volt Feed through. Install pwr supplies	Red
7S01A	Clean High Volt Feed through. Install pwr supplies	Red
AT02	Railed	Red
6E03	Railed	Red
AT05B	Railed plus Small Leak found	Red
0L10	Suspect leak	Red
AA05	Spurious Burps in Pressure needs investigation	Red
AA06	Spurious Burps in Pressure needs investigation	Red
AA08	Spurious Burps in Pressure needs investigation	Red
AA09	Spurious Burps in Pressure needs investigation	Red
2L24A	Leak check	Red
1L18A	degraded due to leaking ITV	Red
1L22A	buggered out widen trip level	Red
0102	not communicating with epics- had been intermittent	Red
1P01	Configuration issue-Ketchum	Red
1A24	Railed needs investigation	Red
1A26	Railed needs investigation	Red
2A16	Railed needs investigation	Red
4T09A	Railed needs investigation	Red
6S03A	Railed needs investigation	Red
6E01A	Railed needs investigation	Red
6E02	Railed needs investigation	Red
6T06A	Railed needs investigation	Red
6A01	Railed needs investigation	Red
8A25	Yellow needs investigation	Red
8R01	Yellow needs investigation	
5C03	Intermittant grn, yellow, railed. Investigate	Red
9A22	Railed needs investigation	Red
9R07A	Railed needs investigation	Red
1R09	Railed new	Red







## Vac Improvements – VIP's

VIP Recovery

- 81% Complete

Joint effort troubleshooting by Vac & Vac ICN to include cables, connectors, cards, VIP hi-potting, VIP repair, and power supply replacements.

Additional improvements made by Vac ICN to Rad harden the VIP power supplies with upgraded HV diodes.

VIP	Problem	Status
3A17	Pump Shorted	Green
4S00B	Railed	Red
4S01A	Railed	Red
4S03A	Railed	Green
4S00C	Railed	Red
BS00	Clean High Volt Feed through. Install pwr supplies	Green
3S02	Clean High Volt Feed through. Install pwr supplies	Green
9S01	Clean High Volt Feed through. Install pwr supplies	Green
7S01A	Clean High Volt Feed through. Install pwr supplies	Green
AT02	Railed	Green
6E03	Railed	Green
AT05B	Railed plus Small Leak found	Green
0L10	Suspect leak	Green
AA05	Spurious Burps in Pressure needs investigation	Green
AA06	Spurious Burps in Pressure needs investigation	OFF
AA08	Spurious Burps in Pressure needs investigation	OFF
AA09	Spurious Burps in Pressure needs investigation	OFF
2L24A	Leak check	Green
1L18A	degraded due to leaking ITV	Green
1L22A	buggered out widen trip level	Green
0102	not communicating with epics- had been intermittent	Green
1P01	Configuration issue-Ketchum	Green
1A24	Railed needs investigation	Green
1A26	Railed needs investigation	
2A16	Railed needs investigation	Green
4T09A	Railed needs investigation	Green
6S03A	Railed needs investigation	Green
6E01A	Railed needs investigation	Green
6E02	Railed needs investigation	Green
6T06A	Railed needs investigation	Green
6A01	Railed needs investigation	Green
8A25	Yellow needs investigation	Green
8R01	Yellow needs investigation	Green
5C03	Intermittant grn, yellow, railed. Investigate	OFF
9A22	Railed needs investigation	Green
9R07A	Railed needs investigation	Green
1R09	Railed new	Green

]	Counts		]
	30	Green	<80 uA
	3	Red	≥100 uA
	0	Yellow	80-99 uA
	4	OFF	
	37	Total VIP's	]





## **Synchrotron Radiation Effects**

### Analysis of Thermal effects\*

Synchrotron radiation heating was evaluated in the higher energy arcs (x-direction) and the higher energy spreader/recombiner dipoles (y-direction).

Arc's max temperature at girder bellows flange is 70 deg C (158F)

ZA's max temperature at top of chamber is 39 deg C (102 F).

Reports indicate these are conservative temps higher than expected and indicate the synchrotron radiation heating will not be a problem for 12GeV CEBAF.

### - Run Experience

During our Spring run some vacuum excursions were noted in the 2R and 2S regions. As a precautionary measure additional Turbo pumps were added to the common vacuum in 2R and 2S (unexpected synchrotron radiation effect?). The pumps provided no change in the vacuum state and were valved out. The machine settled out and the Turbo's remained valved out for the duration of the run.

### Actions Taken

The turbo pumps were removed and serviced, if needed they are ready to be deployed.

<sup>\*&</sup>quot;Synchrotron Light Radiation Heating in 1<sup>st</sup> Spreader" – 2010 (unreleased), C. Dubbe





<sup>\*&</sup>quot;Synchrotron Radiation Power at CEBAF 12 GeV Upgrade" B Yunn and Eduard Pozdeyev. TN-06-004

<sup>\*\*</sup>Synchrotron Radiation Thermal Effect on the 12 GeV CEBAF" - June 20, 2006, M. Wiseman, S. Slachtouski, K. Wilson, and B. Yunn

## **Vacuum Spares**

- Position Switches, Metal 0 (\$640 ea), Plastic 24
- VBV's
  - Linacs 4
  - General Accel 20
- VIP's
  - New 11 L/s 2
  - New 25 L/s 1 (\$1800 ea)
  - 11 L/s ready for rebuild (\$600 ea)
  - 11 L/s on Rad Hold 21 (approx. 6 mo to 1 yr to release)
- VIP Ion Packs/ Power Supplies 11
- Tunnel Pump Carts 4





- Proactive improvements have been made to the Vacuum System based on downtime and repairs and is ready for the 12 GeV run.
- Vacuum Improvements will continue during upcoming SAD's.





## Thank You!!!

Anthony Dela Cruz George Greenfield John Heckman Leo Ketchum Jim Kortze Mark Lester Greg Marble Elliott Smythe Joshua Thomason



