

| <b>NCSX FY05 ECP-21 reconciliation</b>                    |               |               |   |               |               |  |  |
|---|---------------|---------------|---|---------------|---------------|--|--|
|   | <b>ECP 18</b> | <b>change</b> | <b>description</b>  | <b>ECP 21</b> | <b>change</b> | <b>description</b>   |  |
| 111 - Limiters  | 0             | -             |   | 0             | -             |  |  |
| <b>12 - Vacuum Vessel Systems</b>                         |               |               |   |               |               |  |  |
| 121 - Vacuum Vessel Assembly                              | 8,061         | 155           | .Increased Viola to 2 days /week oversight +\$63k;<br>Increased field weld joint full size sample +=\$96k | 8,061         | -             |  |  |
| 122 - Vacuum Vessel Thermal Insulation                    | 176           | 1             |   | 176           | -             |  |  |
| 123 - Vacuum Vessel Heating and Cooling Distrib           | 373           | (2)           |   | 373           | -             |  |  |
| 124 - Vacuum Vessel Supports                              | 98            | 36            | .Lateral supports +22k  | 98            | -             |  |  |
| 125 - Vacuum Vessel Local I&C                             | 29            | 2             |   | 29            | -             |  |  |
| <b>subtotal</b>   | <b>8,737</b>  | <b>191</b>    |   | <b>8,737</b>  | <b>-</b>      |  |  |
| <b>13 - Conventional Coils</b>                            |               |               |   |               |               |  |  |
| 130 - Conventional Coil Design                            | 738           | 125           | <b>Kalish re-estimate of new design</b>   | 738           | -             |  |  |
| 131 - TF Coils  | 1,595         | 136           | <b>Kalish re-estimate of new design</b>   | 1,595         | -             |  |  |
| 132 - PF Coils  | 1,870         | 93            | Kalish re-estimate  | 1,870         | -             |  |  |
| <b>133 - External Trim Coils</b>                          | 146           | (35)          | Kalish re-estimate  | 146           | -             |  |  |
| 134 - Conventional Coil Local                             | 93            | 19            | Kalish re-estimate  | 93            | -             |  |  |
| <b>subtotal</b>   | <b>4,441</b>  | <b>337</b>    |   | <b>4,441</b>  | <b>-</b>      |  |  |
| <b>14 - Modular Coils</b>                                 |               |               |   |               |               |  |  |
| 141 - Modular Coil Winding Form                           | 13,181        | 299           | +\$52k MCWF analysis, +85 EIO s/c,+54 JPP s/c,+79 title III MCWF fab                                      | 13365.68      | 185           | Add'l cost of pre-production casting. (Job 1404)             |  |
| <b>142 - Modular Coil Windings and Assembly</b>           | 9,614         | 37            | Chrzanowski/Meighan oversight of TRC +202k  | 9843          | 229           | Closeout of winding R&D and mat't testing program (job 1406) |  |
| 143 - Modular Coil Local I&C                              | 120           | (1)           |   | 120           | -             |  |  |
| <b>144 - Modular Coil Winding Facility &amp; Fixtures</b> | 3,285         | 71            |   | 3,285         | -             |  |  |
| <b>subtotal</b>   | <b>26,200</b> | <b>406</b>    |   | <b>26,614</b> | <b>414</b>    |  |  |
| <b>15 - Structures</b>                                    |               |               |   |               |               |  |  |
| 151 - Coil Support Structure                              | 1,381         | (67)          | Kalish re-estimate  | 1,381         | -             |  |  |
| <b>16 - Coil Services</b>                                 |               |               |   |               |               |  |  |
| 161 - LN2 Distribution                                    | 338           | 1             |   | 338           | -             |  |  |
| 162 - Electrical Leads                                    | 619           | (2)           |   | 619           | -             |  |  |
| 163 - Coil Protection System                              | 79            | 1             |   | 79            | -             |  |  |
| <b>subtotal</b>   | <b>1,036</b>  | <b>(1)</b>    |   | <b>1,036</b>  | <b>-</b>      |  |  |
| <b>17 - Cryostat and Base Support Structure</b>           |               |               |   |               |               |  |  |
| 171 -Cryostat   | 878           | 15            |   | 878           | -             |  |  |
| 172 - Base Support Structure                              | 443           | 5             |   | 443           | -             |  |  |
| <b>subtotal</b>   | <b>1,321</b>  | <b>20</b>     |   | <b>1,321</b>  | <b>-</b>      |  |  |
| <b>18 - Field Period Assembly</b>                         |               |               |   |               |               |  |  |
| 181 - Field Period Assembly Planning/Oversight            | 1,014         | (365)         | Reduced Viola to .7 ft during FP assy.-\$175k. \$190 transferred to wbs185                                | 1,014         | -             |  |  |
| 182 - TFTR Test Cell Area preparations                    | 0             | (93)          | part of FP assy   | 0             | -             |  |  |
| 183 - Receive Inspect and Test Coils                      | 79            | 2             |   | 79            | -             |  |  |
| 184 - Receive Inspect and Test VV                         | 530           | 204           | +202k increased cost for stud instl. cooling tubes, magnetics instl,                                      | 530           | -             |  |  |
| 185 - Assemble Field Periods                              | 1,819         | 309           | +\$129 MC sub-assy.   | 1,819         | -             |  |  |
| 186 - Tooling Design and Fabrication                      | 1,200         | (17)          |   | 1,200         | -             |  |  |
| 187 - Measurement Systems                                 | 476           | 13            |   | 476           | -             |  |  |
| <b>subtotal</b>   | <b>5,118</b>  | <b>52</b>     |   | <b>5,118</b>  | <b>-</b>      |  |  |
| <b>19 - Stellarator Core Management and Integration</b>   |               |               |   |               |               |  |  |
| 191 - Stellarator Core Management & Oversight             | 946           | (167)         |   | 946           | -             |  |  |
| 192 - Stellarator Core Integration & Analysis             | 1,475         | (94)          | Demo method for determining current center +88.Moved Brooks to WBS 82 -158                                | 1,475         | -             |  |  |
| <b>subtotal</b>   | <b>2,421</b>  | <b>(260)</b>  |   | <b>2,421</b>  | <b>-</b>      |  |  |
| <b>SUBTOTAL WBS 1</b>                                     | <b>50,656</b> | <b>679</b>    |   | <b>51,070</b> | <b>414</b>    |  |  |
| <b>21 - Fueling Systems</b>                               | 81            | 1             |   | 81            | -             |  |  |
| <b>22 - Torus Vacuum Pumping Systems</b>                  | 389           | 1             |   | 389           | -             |  |  |
| <b>25 - Neutral Beam Injection System</b>                 | 309           | -             |   | 309           | -             |  |  |
| <b>SUBTOTAL WBS 2</b>                                     | <b>778</b>    | <b>1</b>      |   | <b>778</b>    | <b>-</b>      |  |  |
| <b>31 - Magnetic Diagnostics</b>                          | 414           | (42)          | Deleted \$41k for install of sensors and mag diag. Already incl in wbs 184                                | 414           | -             |  |  |
| <b>36 - Edge and Divertor Diagnostics</b>                 | 43            | (0)           |   | 43            | -             |  |  |
| <b>38 - Electron Beam (EB) Mapping</b>                    | 291           | (5)           |   | 291           | -             |  |  |
| <b>39 - Diagnostics Integration</b>                       | 369           | 3             |   | 369           | -             |  |  |
| <b>SUBTOTAL WBS 3</b>                                     | <b>1,117</b>  | <b>(44)</b>   |   | <b>1,117</b>  | <b>-</b>      |  |  |
| <b>41 - AC Power</b>                                      |               |               |   |               |               |  |  |
| 411 - Auxliary AC Power Systems                           | 440           | (31)          | eliminated outlets on 2nd level   | 440           | -             |  |  |
| 412 - Experimental AC Power Systems                       | 45            | 2             |   | 45            | -             |  |  |
| <b>43 - DC Systems</b>                                    |               |               |   |               |               |  |  |
| 431 - C-Site DC Systems                                   | 446           | (78)          |   | 446           | -             |  |  |
| <b>432 - D-to-C Site DC Systems</b>                       |               | (14)          |   |               | -             |  |  |
| 433 - D-Site DC Systems                                   |               | (13)          |   |               | -             |  |  |
| <b>44 - Control and protection Systems</b>                |               |               |   |               |               |  |  |

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| 441 - Electrical Interlocks                                 | 344   | 13            |  | 344           | -  |  |    |
| 442 - Kirk Key Interlocks                                   | 78  | (12)          |  | 78            | -  |  |    |
| 443 - Real Time Control Systems                             | 13  | 1             |  | 13            | -  |  |    |
| 444 - Instrument Systems                                    | 294   | (55)          |  | 294           | -  |  |    |
| 445 - Coil protection Systems                               | 486   | 119           | Increased scope from Raki  | 486           | -  |  |    |
| <b>45 - Power System Design and Integration</b>             |   | -             |  |               | -  |  |    |
| 451 - System Design and Interfaces                          | 518   | 8             |  | 518           | -  |  |    |
| 452 - Electrical Systems Support                            | 244   | 4             |  | 244           | -  |  |    |
| 453 - System Testing (PTP's)                                | 305   | 3             |  | 305           | -  |  |    |
|   |   | -             |  |               | -  |  |    |
| <b>46 - FCPC Building Modifications</b>                     | 1   | -             |  | 1             | -  |  |    |
| <b>SUBTOTAL WBS 4</b>                                       | <b>3,214</b>  | <b>(54)</b>   |  | <b>3,214</b>  | <b>-</b>                                       |  |    |
|   |   | -             |  |               | -  |  |    |
| <b>51 - TCP/IP Infrastructure Systems</b>                   | 289   | (4)           |  | 289           | -  |  |    |
| <b>52 - Central Instrumentation &amp; Control</b>           | 569   | (91)          |  | 569           | -  |  |    |
| <b>53 - Data Acquisition &amp; Facility Computing</b>       | 328   | (87)          |  | 328           | -  |  |    |
| <b>54 - Facility Timing &amp; Synchronization</b>           | 207   | (85)          |  | 207           | -  |  |    |
| <b>55 - Real Time Plasma &amp; Power Supply Control Sys</b> | 151   | (3)           |  | 151           | -  |  |    |
| <b>56 - Central Safety Interlock Systems</b>                | 358   | (4)           |  | 358           | -  |  |    |
| <b>58 - Central I&amp;C management and Integration</b>      | 13  | -             |  | 13            | -  |  |    |
| <b>SUBTOTAL WBS 5</b>                                       | <b>1,915</b>  | <b>(274)</b>  |  | <b>1,915</b>  | <b>-</b>                                       |  |    |
| <b>61 - Water Systems</b>                                   |   | -             |  |               | -  |  |    |
| 611 - C-Site Cooling System                                 | 151   | (2)           |  | 151           | -  |  |    |
| 612 - NB Water Cooling Systems                              |   | 0             |  |               | -  |  |    |
| 613 - Vacuum Pumping System                                 | 89  | (11)          |  | 89            | -  |  |    |
| 614 - Bakeout Water System                                  |   | -             |  |               | -  |  |    |
| <b>62 - Cryogenic Systems</b>                               |   | -             |  |               | -  |  |    |
| 621 - LN2-LHe Supply System                                 | 221   | (4)           |  | 221           | -  |  |    |
| 622 - LN2 Coil Cooling Supply                               |   | -             |  |               | -  |  |    |
| 623 - GN2 Cryostat Cooling System                           | 219   | (4)           |  | 219           | -  |  |    |
|   |   | -             |  |               | -  |  |    |
| <b>63 - Utility Systems</b>                                 | 104   | (19)          |  | 104           | -  |  |    |
| <b>65 - Facility Systems Integration</b>                    |   | -             |  |               | -  |  |    |
| 650 - Facility Systems Integration                          | 32  | -             |  | 32            | -  |  |    |
| <b>SUBTOTAL WBS 6</b>                                       | <b>825</b>  | <b>(40)</b>   |  | <b>825</b>    | <b>-</b>                                       |  |    |
| <b>71 - Shield Wall Seismic Modifications</b>               | 32  | -             |  | 32            | -  |  |    |
| <b>72 - Control Room Refurbishment</b>                      | 50  | 1             |  | 50            | -  |  |    |
| <b>73 - Platform Design &amp; Fabrication</b>               | 161   | 0             |  | 161           | -  |  |    |
| <b>74 - Machine Assembly Planning and Oversight</b>         |   | -             |  |               | -  |  |    |
| 740 - Machine Assembly Planning and Oversight               | 153   | 5             |  | 153           | -  |  |    |
| 741 - Planning Prior to Machine Assembly                    | 282   | (0)           |  | 282           | -  |  |    |
| 742 - Construction Management                               | 1,068   | (126)         |  | 1,068         | -  |  |    |
| <b>75 - Test Cell and Basement Assembly Operations</b>      |   | -             |  |               | -  |  |    |
| 750 - Test Cell & Basement Assembly Operations              | 2,239   | 54            |  | 2,239         | -  |  |    |
| <b>76 - Tooling Design &amp; Fabrication</b>                | 223   | (1)           |  | 223           | -  |  |    |
| <b>SUBTOTAL WBS 7</b>                                       | <b>4,208</b>  | <b>(67)</b>   |  | <b>4,208</b>  | <b>-</b>                                       |  |    |
| <b>81 - Project Management and Control</b>                  | 3,450   | (107)         | re-estimated out year needs. Cost share with res prep                    | 3,450         | -  |  |    |
| <b>82 - Project Engineering</b>                             | 4,368   | 160           |  | 4,368         | -  |  |    |
| <b>84 - Project Physics</b>                                 | 412   | 0             |  | 470           | 58   | Close out cost . MIE Tasks concluded in FY04 |    |
| <b>85 - Integrated Systems Testing</b>                      | 1,221   | 1             |  | 1,221         | -  |  |    |
| <b>SUBTOTAL WBS 8</b>                                       | <b>9,451</b>  | <b>54</b>     |  | <b>9,509</b>  | <b>58</b>                                      |  |    |
| <b>PPPL Allocations</b>                                     | <b>1,129</b>  | <b>145</b>    | Adjusted based upon FY04 allocation costs and estimated out year mapping | <b>1,129</b>  | <b>-</b>                                       |  |    |
| <b>Contingency</b>  | 13,053  | (402)         |  | 12,581        | (472)  |  |    |
|   | <b>86,346</b>   | <b>(0)</b>    |  | <b>86,346</b> | <b>(0)</b>                                     |  |    |
|   |   |               |  |               |  |  |    |
|   | <b>Cost risks</b>   |               |  |               | <b>Cost opportunities</b>                      |  |    |
|   | VVSA contract -marking of stud locations (Job 1250 FY05)  |               |  | 10.5          | VV full size weld test article (Job 1206 FY05) |  | 65 |
|   | VVSA contract oversight & design support (Job 1250 FY05)) |               |  | 133.0         |  |  |    |
|   | MC winding final design details (Job 1403 FY05))          |               |  | 85.0          |  |  |    |
|   | MC TRC increased cost (Job 1410 FY05))                    |               |  | 70.0          |  |  |    |
|   | MCWF fracture analysis (Job 1413 FY05))                   |               |  | 25.0          |  |  |    |
|   | Metrology support program (Job 1804 FY05)                 |               |  | 99.0          |  |  |    |
|   | VV Spacer manipulator WBS 173 (FY06?)                     |               |  | ?             |  |  |    |
|   | FP Assy facility prep dsn/install (FY06 ?)                |               |  | 86.0          |  |  |    |
|   |   |               |  |               |  |  |    |
|   |   |               |  | 509           |  |  | 65 |