

**Stellarator Core Integration**

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M. J. Cole for the NCSX Design Team

**Stellarator Core Integration Overview**



* Integration at Oak Ridge

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* Subsystem/component Interfaces
* Manpower Loading
* Risk Mitigation Activities



* This WBS provides integration support during fabrication and assembly

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at PPPL

* Integration support consist of:
* Installation oversight and inspection of Stellarator Core components
* Verifying fabrication problems very early before fabrication starts is key to

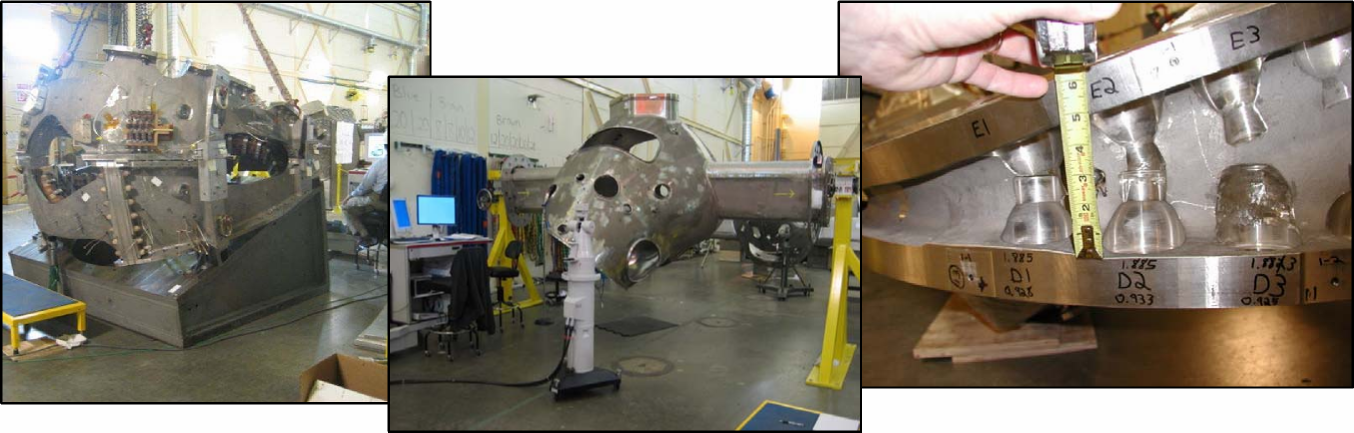
preventing delays that impact cost and schedule

* Provide as built drawings and models to document the fabrication details
* Address risk mitigation activities and integrating results into the assembly



• Installation oversight and inspection of Stellarator Core components

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It is important to walk around even though you are not addressing a specific problem – it is amazing what you can learn

**Integration at Oak Ridge/PPPL**



• Verifying fabrication problems very early before fabrication starts is key

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to preventing delays that impact cost and schedule

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| Station 6 machine assembly does not start for several years. Addressing problems early saves time and money if problems can be identified and  solutions resolved. |
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**Integration and Subsystem/component**





**Interfaces**



* Managing assembly interfaces is critical to meeting cost and schedule

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objectives

* During the design phase, interface requirements are met by
* Reviewing and checking interfaces with mating components
* Coordinating requirements with responsible individuals of mating components
* Checking released information to verify requirements have been incorporated and interfaces are correct
* Checking CAD models for interferences
* During assembly operations
* Reviewing top level assembly models before assembly to assure assembly is possible and space is available using CAD models that have “as inspected” data reflected in the model



• Reviewing and checking interfaces with mating components

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| Integration is not always using the latest 3D Cad model |
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•Checking released information to verify requirements have been incorporated and interfaces are correct

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**Manpower Loading**



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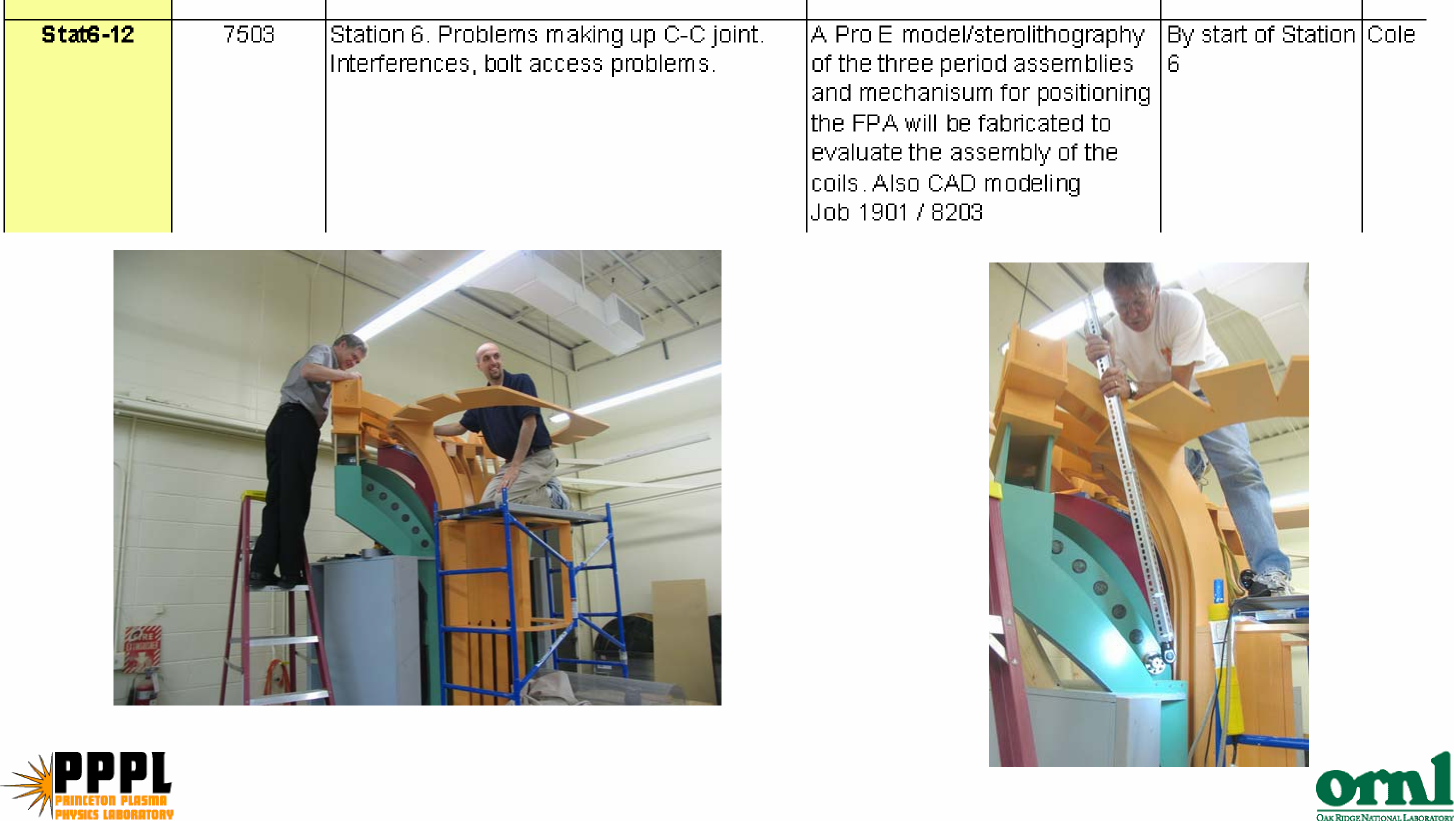
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| Task | **FY08** | **Manpower Loading, FTE  FY09 FY10 FY11** | | | **FY12** | Totals |
| Installation oversight and inspection | 0.20 | 0.40 | 0.40 | 0.40 | 0.00 | 1.40 |
| Verify fabrication problems very early | 0.10 | 0.40 | 0.40 | 0.40 | 0.00 | 1.30 |
| Provide as built fabrication dwgs | 0.10 | 0.20 | 0.20 | 0.20 | 0.00 | 0.70 |
| Risk mitigation activities | 0.20 | 0.80 | 0.70 | 0.40 | 0.00 | 2.10 |
| Reassigned staff availabe for support | 0.00 | 0.60 | 0.60 | 0.60 | 0.00 | 1.80 |
| **Totals by Year** | 0.60 | 2.40 | 2.30 | 2.00 | 0.00 |  |

**Risk Mitigation Activities**



• Risk have been identified in the Risk Register, RR-28a, as shown below

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**Summary**



* Integration is an important part of the project

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* Performing oversight is not just showing up when there is a problem. It is

about being involved.

* If a problem can be identified early and a solution found instead of waiting

until assembly the return in lower cost and lost schedule is significant

* Our Cad systems are **almost** as good as the real thing but sometimes a

stereo lithography model, prototype, or full scale mockup is really important.

* Risk Mitigation activities have been included to address critical issues as

early as possible to avoid possible schedule, cost, and assembly issues