

**NCSX Conceptual Design Cost Estimate Summary Form
(Attachment 1a)**

SUMMARY DESCRIPTION

WBS Number: 3	Title: Diagnostics
Originator: Dave Johnson	
<u>Description</u>	
<p>NCSX operations are divided into six phases:</p> <ol style="list-style-type: none">1. Initial Operation2. Field Line Mapping3. Initial Ohmic4. Initial Auxiliary Heating5. Confinement and Beta Push6. Long Pulse <p>The NCSX Fabrication Project includes diagnostic equipment needed to satisfy measurement needs during Phases 1 and 2. In addition, the project includes planning for future diagnostic upgrades to support the full research mission (phases 3 – 6) on NCSX. This planning will impact the detailed design of the machine in areas including port access, equipment platform, infrastructure services, and data acquisition capacity.</p> <p>Included in the Fabrication Project are all the engineering and physics design efforts starting with the preliminary design phase (Title I) and ending with completion of the Fabrication Project, all the necessary Research and Development (R&D) to support the design effort, all component fabrication, assembly, and installation activities, and all system level commissioning and testing, including diagnostic alignments and calibrations.</p> <p>This summary-level WBS element consists of plasma diagnostic subsystems and components to provide the capability to measure the performance of the NCSX device.</p> <p>Diagnostic Systems (WBS 3) include:</p> <ul style="list-style-type: none">• Magnetic Diagnostics (WBS 31);• Fast Particle Diagnostics (WBS 32);• Impurity Diagnostics (WBS 33);• MHD Diagnostics (WBS 34);• Profile Diagnostics (WBS 35);• Edge and Divertor Diagnostics (WBS 36);• Turbulence Diagnostics (WBS 37);• EB Mapping Diagnostics (WBS 38); and• Diagnostics Integration (WBS 39). <p>The measurement requirements that the diagnostics must satisfy derive from the research program outlined in the PDD, as indicated in Table ____.</p> <p><u>Description of Existing Equipment/Facilities to be Reused:</u> None.</p> <p><u>Description of Major Modifications Required to Existing Equipment/Facilities:</u> Five rooms on first floor adjoining west side of NCSX Cell need to be cleared out for diagnostic use. Also space in the control room along the shield wall needs to be reserved for diagnostic racks.</p>	

Date: 9/15/03