

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

**SUMMARY DESCRIPTION**

<b>WBS Number: 11</b>	<b>Title: In-Vessel Components</b>
<b>Originator: Paul Goranson</b>	
<b><u>Description</u></b>	
<p>This WBS element consists of all the in-vessel systems required to absorb the heat and particle fluxes from the plasma and to effect divertor operation for neutral recycling and density control. This WBS element also includes all the in-vessel systems that serve to protect the vacuum vessel and in-vessel components from energetic particles and heat fluxes from the plasma. Sub-elements within WBS 11 include the:</p> <ul style="list-style-type: none"><li>• Limiters (WBS 111);</li><li>• Internal Liner (WBS 112);</li><li>• Internal Trim Coils (WBS 113); and</li><li>• In-Vessel Component Local I&amp;C (WBS 114)</li></ul> <p>For the NCSX Fabrication Project, local limiters will be supplied that satisfy the operational requirements for Phases 1-2 of operation. These limiters consist of simple flat tiles attached to the vacuum vessel assembly flanges, which are located on either side of the <math>v=1/2</math> symmetry planes. For the NCSX Fabrication Project, this WBS element includes the design effort to assure that the complete assembly of in-vessel components required to meet the upgrade requirements can plausibly be accommodated as a future upgrade. The design, fabrication, and installation of these upgrades are outside the scope of the Fabrication Project.</p>	
<p><u>Description of Existing Equipment/Facilities to be Reused:</u> <b>None</b></p>	
<p><u>Description of Major Modifications Required to Existing Equipment/Facilities:</u> <b>None</b></p>	