

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

SUMMARY DESCRIPTION

WBS Number: 142	Title: Modular Coil Windings and Assembly
Originator: Dave Williamson	
<p><u>Description:</u> This WBS element consists of the design and fabrication of the modular coil windings and coil assembly. The modular coil set consists of three field periods with 6 coils per period, for a total of 18 coils. Due to symmetry, only three different coil shapes are needed to make up the complete coil set. Within the modular coil envelope, a thick web supports two multi-turn winding packs. The design concept uses flexible, copper cable conductor that has been compacted into a rectangular cross-section and wrapped with Kapton and glass tape insulation. The conductor is wound in a double pancake on each side of the structural web. Copper cladding consisting of copper sheet formed to the surface of the winding form and outside of winding pack (or a different arrangement to be determined during design) is provided for coil cooling. After winding is complete, the final geometry is verified and the assembly is vacuum pressure impregnated with epoxy to complete the insulation system. The epoxy fills the voids within the cable conductor so the winding pack becomes a monolithic copper-glass-epoxy composite. Auxiliary clamping brackets are then installed. This element includes the conductor, insulation, winding, integral cooling components (e.g. chill plates), epoxy impregnation, clamp brackets, inspection and electrical testing.</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> None</p>	