

NCSX
Statement of Work
TF Coil Wedge Castings

NCSX-SOW-131-02-00

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Controlled Document

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REVISIONS

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1 GENERAL INFORMATION

1.1 Introduction

This Statement of Work is for the manufacture of the wedge castings for the National Compact Stellarator Experiment (NCSX). A total of thirty-six (36) wedge castings are required. The wedge castings are defined in Specification NCSX-CSPEC-131-03.

The National Compact Stellarator Experiment (NCSX) is an experimental research facility that is to be constructed at the Department of Energy's Princeton Plasma Physics Laboratory (PPPL). Its mission is to acquire the physics knowledge needed to evaluate compact stellarators as a fusion concept, and to advance the understanding of three-dimensional plasma physics for fusion and basic science. The TF Coils are a Primary component of the NCSX Device. Eighteen equally spaced D shaped coils surround the core of the machine. Attached to each of those eighteen coils is a pair of stainless steel wedge shaped castings. When the device is fully assembled these castings react the loads generated as the toroidally placed coils are pressed forward by the electromagnetic loads.

The NCSX project is managed by PPPL in partnership with the Oak Ridge National Laboratory. This Subcontract will be administered by PPPL. Further description of the NCSX can be found at <http://www.pppl.gov/ncsx/>.

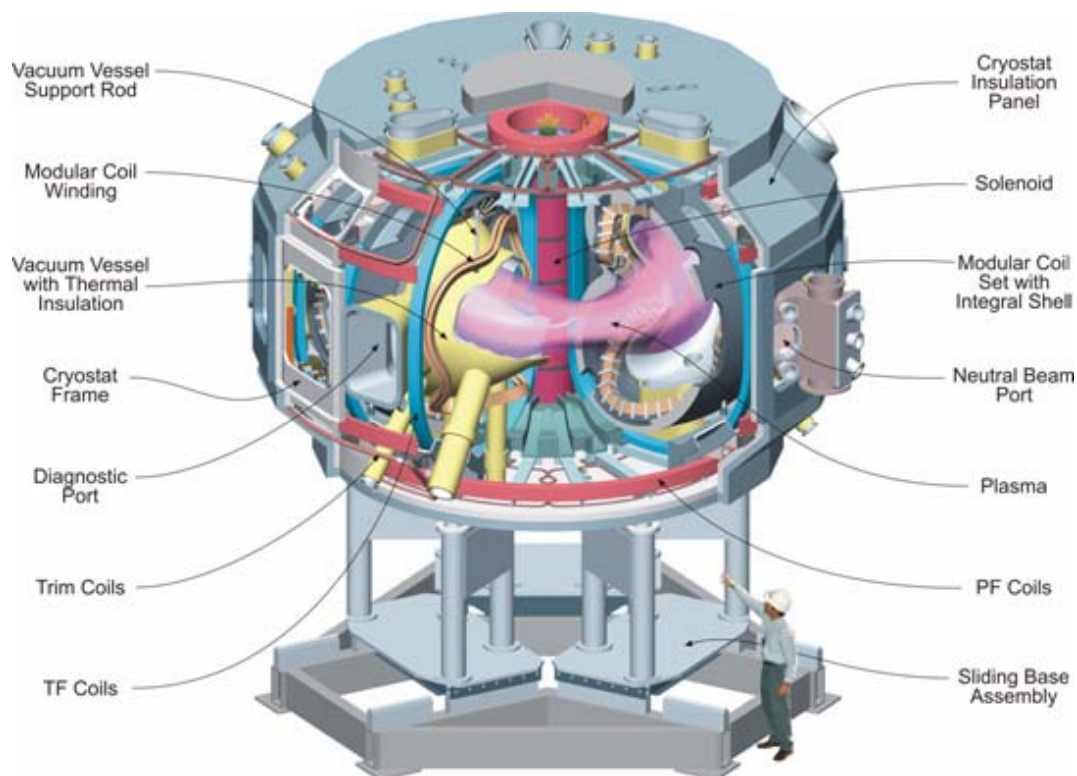


Figure 1 - The NCSX Device and Identification of Major Components

Note in particular the blue TF Coils (labeled). There are 18 TF Coils spaced equally around the assembly. The pair of wedge castings attached to each of these coils at the center of the assembly where the TF Coils meet are the subject of this SOW. Note: This Figure is only for illustration and should not be used in the performance of this Scope of Work

2 APPLICABLE DOCUMENTS

2.1 Product Specification

The castings are to meet the requirements of NCSX-CSPEC-131-03.

2.2 Supplier Documents

The supplier-provided documents shall include PPPL-approved Manufacturing, Inspection, Test Plan/Quality Assurance (MIT/QA) Plan and associated procedures.

2.3 Weld Qualifications

Welding Qualifications shall meet the requirements of ASTM A488/A488M-04, Standard Practice for Steel Castings, Welding, Qualifications of Procedures and Personnel.

3 WORK REQUIREMENTS

The supplier shall manufacture, inspect, test and deliver to PPPL (36) wedge castings that shall conform to the applicable specification. Processing shall be in accordance with the supplier's PPPL-approved Manufacturing, Inspection, Test and Quality Assurance Plan, and associated procedures. Supplier shall provide all process documentation identified in Section 5.

4 QUALITY ASSURANCE

4.1 Inspection/ Surveillance/Audit by PPPL

Authorized representatives of PPPL and the U. S. Government shall have the right at all reasonable times to visit the Subcontractor's premises and those of Subcontractor's suppliers during the performance of the Subcontract for the purposes of inspection, surveillance, audit and/or obtaining any required information as may be necessary to assure that items or services are being furnished in accordance with specified requirements. Such visits shall be coordinated with the Subcontractor's personnel to minimize interference with the normal operations of said premises. The Subcontractor shall make available records and documentation necessary for this function and shall provide all reasonable facilities and assistance for the safety and convenience of PPPL and/or U. S. Government representatives in the performance of their duties. PPPL and the U. S. Government recognize the Subcontractor's right to withhold information concerning proprietary processes. The Subcontractor agrees to insert the paragraph above in each lower-tier procurement issued hereunder.

4.2 Subcontractor's Responsibility for Conformance

Neither PPPL review and/or approval of Subcontractor's documents nor PPPL inspection of Subcontractor's items or services shall relieve the Subcontractor of responsibility for full compliance with requirements of the purchase order/contract. The Subcontractor is responsible for assuring that all requirements and restrictions are imposed on any sub-tier suppliers.

4.3 Nonconforming Items

Nonconforming items shall be positively identified, and, where possible, segregated to prevent use. PPPL must be notified of nonconformances within one (1) business day. The Subcontractor shall document each nonconformance, identifying the extent and location of the nonconformance and proposing a disposition. The written concurrence of PPPL is required prior to implementing the disposition. The Subcontractor's system shall provide not only for timely resolution of nonconformances but also for analysis of nonconformances to determine root causes and to implement appropriate and effective corrective actions.

4.4 Subcontractor's Quality Assurance Program

The Subcontractor shall maintain an effective Quality Assurance Program to assure that the Subcontractor's work meets the required quality and is performed in accordance with contractual requirements. Subcontractor's quality assurance function shall be actively involved in the planning, processing oversight, problem resolution, and determination of acceptability of all work under this SOW. The function shall be organized to have sufficient authority and independence to identify quality problems, verify conformance of supplied items or services to specified requirements and obtain satisfactory resolution of conflicts involving quality.

4.5 MIT / QA Plan

The Subcontractor shall provide PPPL with manufacturing, inspection and test information sufficient to convey an overview of the processing and the adequacy of the controls, inspections, and tests that are part of the manufacturing process. The submittal, the Manufacturing, Inspection, Test, and Quality Assurance Plan (MIT/QA Plan), may consist of the Subcontractor's standard documents such as Travelers/Routers/Process Sheets and procedures or may require development of a new document, as long as the submittal accomplishes the following:

- outlines the sequence of operations,
- identifies critical manufacturing operations,
- identifies inspections, examinations, and tests, and

- include procedures for special processes, inspections, and tests.

The MIT/QA Plan is required for PPPL review and approval prior to start of fabrication.

From the plan, PPPL may designate selected operations as mandatory "witness" points. Subcontractor shall provide PPPL with a minimum of five (5) working days notice in advance of these witness points. Such witness points shall be mutually planned to minimize delays

4.6 Deviations to the Approved MIT / QA Plan or Procedures

Deviations to the approved documents shall be included in the weekly report. The Subcontractor is required to obtain PPPL's written approval for deviations which may adversely affect conformance to the contracted delivery schedule or product specification. Deviations requiring written approval are to be submitted on the PPPL Request for Deviation form (Attachment II).

4.7 Inspection and Test Procedures

Inspections and tests shall be performed in accordance with written procedures referencing criteria for acceptance or rejection. Except where specifically stated otherwise, actual data and accept/reject status for each inspection and test shall be documented. Reports shall clearly identify the item inspected, the locations or areas covered by the report, the performing individual, the date performed, equipment used (with calibration status), and the signature of the authorized individual.

4.8 Document Traceability and Records

The Subcontractor shall maintain a system of documentation whereby objective evidence of required operations, inspections, examinations, and tests is systematically compiled, indexed, stored and ultimately provided to PPPL per paragraph 5.4.3, Process History. Such objective evidence may include "travelers"; and material test, certification, inspection, examination, test and nonconformance reports; which shall be complete, legible, and validated by responsible personnel and shall be traceable to subject items.

4.9 Equipment/Material Identification and Status

Material and equipment identification shall be maintained throughout the program and be traceable to records. Status of acceptability shall be readily discernible through the Subcontractor's use of tags, stamps, serial numbers or other positive means.

4.10 Calibration of Test and Measuring Equipment

Inspections and tests shall be performed using properly calibrated measuring and test equipment. Subcontractor shall have in its possession the necessary equipment to perform the required inspections

and tests. Calibration standards shall be traceable to the National Institute for Standards and Technology (NIST) or equivalent acceptable to PPPL and shall not be used for shop inspections, but instead be protected against damage or degradation.

4.11 Control of Special Processes

Subcontractor shall use trained and qualified personnel and qualified written procedures in accordance with specified requirements for the performance of certain special processes, including but not limited to, welding, dimensional inspection, heat treatment, nondestructive examination, etc. Copies of special process procedures and personnel qualifications shall be submitted to PPPL for review and approval a minimum of five (5) working days prior to performance of the work. Welding procedures and personnel shall be qualified in accordance with ASTM A488/A488M-04, Standard Practice for Steel Castings, Welding, Qualifications of Procedures and Personnel.

4.12 PPPL Receiving and Inspection

PPPL will perform Receiving Inspection on items supplied by Subcontractor.

5 DELIVERABLES

5.1 Prior to Fabrication Release

5.1.1 MIT/QA Plan, and Associated Procedures

The Supplier shall provide their MIT/QA plan and all associated procedures to PPPL for approval prior to beginning fabrication

5.2 Weekly Reports

Brief weekly status reports covering technical, administrative, and quality activities and notable problems/issues and progress photographs. This report can be submitted as a few sentences in email form.

5.3 Monthly Reports

The Subcontractor shall prepare and submit monthly e-mail reports indicating schedule progress for each task/deliverable planned.

- The Subcontractor shall submit a milestone schedule that clearly indicates the tasks to be accomplished and the time frame over which each task will be accomplished.

- The Subcontractor shall report (e-mail report satisfactory) schedule progress against each milestone by indicating actual and forecast finish dates. A narrative explanation of schedule delays shall also be provided.

5.4 TF Coil Wedge Castings

5.4.1 Final Product

The supplier shall deliver to PPPL thirty-six (36) wedge castings that shall conform to the applicable specification

5.4.2 Shipping Release Form

Prior to each shipment, the Subcontractor must have submitted to PPPL a completed and signed “Product Quality Certification and Shipping Release” form (Attachment 1 of this SOW), along with a copy of the Process History (ref. Paragraph 5.4.3), and received from PPPL written acceptance to ship.

5.4.3 Process History

Subcontractor shall provide to PPPL one (1) "paper" copy or one (1) "electronic" copy of the Process History, which includes a compilation of documents, detailing the objective evidence of the acceptability of the work performed. The Process History shall be complete and available at the time the Subcontractor requests Release for Shipment. The Process History shall include as a minimum, but not be limited to:

- Material certifications
- Heat treatment charts
- Welding procedures and procedure qualification test records
- Completed nonconformance reports
- Validated inspection and test reports, including radiographs, and inspection measurements”.
- Completed shop travelers or process sheets
- Personnel qualifications for Special Processes (Non Destructive Examination, welding, etc.)
- Signed Shipping Release

5.5 Tooling and Software

All tooling and software specially fabricated /generated for the performance of this SOW shall become the property of the United States Government. Disposition will be per direction of PPPL.

The supplier shall maintain any CAD/CAM files generated in the performance of this SOW for a period of at least three years from the end of the contract.

ATTACHMENT 1 –SHIPPING RELEASE FORM

PLASMA PHYSIC LABORATORY—PPPL

PRODUCT QUALITY CERTIFICATION AND SHIPPING RELEASE					
PROJECT	ITEM DESCRIPTION			SHIPMENT NUMBER	
PPPL SUBCONTRACT/ ORDER NO.	REV .	ITEM NO.	SUPPLIER REFERENCE NO.	REV .	QUANTITY SHIPPED
<u>SUPPLIER'S CERTIFICATION</u>					
<p>This is to certify that the products and services identified herein have been produced under a controlled quality assurance program and are in conformance with the procurement requirements including applicable codes, standards and specifications as identified in the above-referenced documents unless noted below. Any supporting documentation will be retained in accordance with the procurement requirements.</p> <p>SIGNED: _____ DATE: _____</p> <p>TITLE: _____ COMPANY: _____</p>					
<u>PPPL (AUTHORIZED REPRESENTATIVE) SHIPPING RELEASE</u>					
<p>This is to certify that evidence supporting the above Supplier's Certification statement has been audited and no product/service nonconformances from procurement requirements have been found unless noted below. This product/service is hereby released for shipment.</p> <p>This section serves as the Quality Assurance release for the above described product for shipment. It does not constitute an acceptance thereof and does not relieve the Vendor, Manufacturer or Contractor of any and all responsibility or obligation imposed by the purchase contract. It does not waive any rights the Purchaser may have under the purchase contract, including the Purchaser's right to reject the above described material upon discovery of any deviations from requirements of the purchase contract, drawings and specifications.</p>					
NONCONFORMANCES FROM PROCUREMENT QUALITY REQUIREMENTS:					
REMARKS/PRODUCT SERIAL NUMBERS:					
BY PPPL QA REPRESENTATIVE (OR DESIGNEE)				DATE	

ATTACHMENT II. PPPL REQUEST FOR DEVIATION (RFD) FORM

<p><i>NCSX RFD</i></p> <p><i>Part I</i></p>	<p>Number:</p>	<p>RFD Description:</p>
<p>Initiator:</p>		<p>Organization:</p>
<p>List of Impacted Documents: <i>(Specification, MIT/QA Plan, SOW, drawing, etc.)</i></p>		
<p>Cost Impact: <i>(If none, so state)</i></p>		
<p>Schedule Impact: <i>(If none, so state)</i></p>		
<p>Quality Impact: <i>(If none, so state)</i></p>		
<p>State Requirement Deviation is Requested For: <i>(Specification, MIT/QA Plan, SOW, drawing, etc.)</i></p>		
<p>Full Description of the Deviation Requested: <i>(Use continuation pages, e-mails, letter, sketches, etc. as needed and include amplifying information as appropriate to support deviation request.)</i></p>		
<p>Attachments:</p>		
<p>Initiator Signature: _____ Date: _____</p>		