

<b>BROOKHAVEN NATIONAL LABORATORY NATIONAL SYNCHROTRON LIGHT SOURCE</b>	<b>Number:</b> LS-ATF-0001	<b>Revision: A</b>
	<b>Effective:</b> May 24, 2001	<b>Page 1 of 3</b>
Subject: Inspection Procedure for CO <sub>2</sub> TeraWatt Laser Amplifier Pressure Vessel		
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\*Document must contain approved signatures for validity

## 1. SCOPE

This procedure defines the periodic inspection of the ATF CO<sub>2</sub> TeraWatt Laser amplifier pressure vessel. The inspection shall be carried out every 6 months or 4000 hours of pressurized time, whichever ever comes first. This procedure is referenced in and is part of the NSLS Preventive Maintenance Program (MARTI).

## 2. PREREQUISITES

The Laser Amplifier vessel will be depressurized, and disassembled at the main longitudinal flange. The two sections will be separated to allow access. The Mechanical Section Head will be notified prior to the start of inspection. Mechanical Section Head or designee shall witness all inspections.

## 3. INSPECTION TEST REPORT

The Inspection Test Report(s) may be compiled by the witnessing inspector; but the specific test section shall be filled out, signed and dated by the person performing the actual inspection.

Use “[ATF CO<sub>2</sub> TeraWatt Laser Amplifier Inspection Test Report](#)”, latest revision, as needed.  
(Download Inspection Test Report [Word.doc file](#))

Completed Inspection Test Report(s) shall be submitted to NSLS Mechanical Section Head for acceptance.

## 4. PROCEDURE

### 4.1 Main O-Ring Seal

Visually inspect the O-ring Seal for nicks cuts and abrasions. Replace O-ring if any damage is present.

NOTE: Replacement O-ring shall be new and of Viton material. O-ring shall be sized by a designee of the NSLS Mechanical Section Head.

#### 4.2 Pressure Vessel Welds

NOTE: All Liquid Penetrant Inspections (LPI) shall be conducted by a qualified inspector per standard BNL specifications. Furthermore, at the discretion of the NSLS Mechanical Section Head, LPIs may be replaced or supplemented by other Non-Destructive Examinations (NDE).

Visually inspect all pressure vessel welds for cracks or voids. No defects are allowed. If there are any questionable areas, an initial LPI shall be performed. If a defect is found it shall be repaired as follows:

- a) Remove defects by grinding to "sound" base material.
- b) LPI the repaired area. No defects allowed.
- c) Weld repair using Central Shops division Weld Procedure SS-1-92, latest revision.
- d) Visual and final LPI shall be performed on repaired area. Repair to longitudinal seam welds shall also be inspected for adequate material thickness. No defects allowed. Any repair of seam weld must be of equal or greater thickness than surrounding base material.

#### 5.0 SUBMITTALS

All inspection test reports shall be submitted to the NSLS Mechanical Section Head for acceptance.

#### 6.0 RELEASE FOR OPERATIONS

NSLS Mechanical Section Head submits to NSLS ESH/Q Associate Chair copies of all appropriate reports, and an acceptance memo releasing laser for operations.

<b>NSLS REVISION/REVIEW LOG</b>	
<b>Document Number:</b>	LS-ATF-0001
<b>Subject:</b>	Inspection Procedure for CO <sub>2</sub> TeraWatt Laser Amplifier Pressure Vessel

> See NSLS Quality Control Coordinator for original revision and review signatures <

<b>REVISION TABLE</b>		
<b>Rev</b>	<b>Description</b>	<b>Date</b>
A	First Issue – previously ATF-TWL-001	05/24/01

<b>REVIEW TABLE</b>			<b>Document Review Period</b>
			<b>5 Year</b>
<b>Rev</b>	<b>Date</b>	<b>Reviewed By:</b>	<b>Reviewed By:</b>

## ATF CO<sub>2</sub> Terawatt Laser Amplifier Inspection Test Report

Form Completed by: \_\_\_\_\_ Date: \_\_\_\_\_  
(Please print legibly)

### **Visual O-ring Inspection:**

Technician Name: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_  
(Please print legibly)

O-ring:             Acceptable/re-useable             Must be replaced

Technician Signature: \_\_\_\_\_ Date: \_\_\_\_\_

If required; new Viton O-ring sized and purchased by:

Name: \_\_\_\_\_  
(Please print legibly)

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

### **Visual Weld Inspections:**

Inspect all the following weld groups.

**A separate inspection sheet shall be filled out for each weld group:**

- Cylindrical shell longitudinal seal weld – both internal and external welds
- Left half – Cylindrical shell to main flange – both internal and external welds
- Right half – Cylindrical shell to main flange – both internal and external welds
- Left half – Cylindrical shell to endplate – both internal and external welds  
double lap joint
- Right half – Cylindrical shell to endplate – both internal and external welds  
double lap joint
- Left half – main flange to endplate – both internal and external welds
- Right half – main flange to endplate – both internal and external welds
- Port tubes to endplate welds – all locations – all welds at specific location
- Port tubes to cylindrical shell – all locations – all welds at specific location
- Port tubes to port flange – all locations – both sides of flange

### ATF CO<sub>2</sub> Terawatt Laser Amplifier Inspection Test Report

#### I. Specific Weld Group Visually Inspected: Check One (1) Only

Technician Name: \_\_\_\_\_ Date of Inspection: \_\_\_\_\_  
(Please print legibly)

- Cylindrical shell longitudinal seal weld: internal & external
- Left half cyl. shell to main flange: internal & external
- Left half cyl. shell to endplate: internal & external
- Left half main flange to endplate: internal & external
- Port tubes to endplate: all locations & specific locations
- Port tubes to port flange: all locations: both sides of flange
- Right half cyl. shell to main flange: internal & external
- Right half cyl. shell to endplate: internal & external
- Right half main flange to endplate: internal & external
- Port tubes to cyl. shell: all locations & specific locations

WELDS:  Acceptable, no further action required  Further NDE Inspection Required – Go to Section II  
Use comment section to specify specific weld(s)

Technician Signature \_\_\_\_\_ Date: \_\_\_\_\_

#### II. Initial NDE of Inspection Area: Weld acceptable, no further action required Weld repair required – Go to Section III

Name of NDE Inspector: \_\_\_\_\_ Date Performed: \_\_\_\_\_  
(Please print legibly)

NDE Inspector's Signature: \_\_\_\_\_

#### III. Weld Repair

Welder Name: \_\_\_\_\_ Date Performed: \_\_\_\_\_  
(Please print legibly)

- a. Defects/Voids removed by grinding to "sound" base material:  Acceptable
- b. NDE of repaired area performed and acceptable  Work completed

Name of NDE Inspector: \_\_\_\_\_ Date Performed: \_\_\_\_\_  
(Please print legibly)

NDE Inspector's Signature: \_\_\_\_\_

- c. Weld Repair Performed:  
Specify welding wire and process performed: \_\_\_\_\_  
 Work completed

- d. Final NDE inspection (and thickness measurement, if required) performed and acceptable:  Work completed.

Name of NDE Inspector: \_\_\_\_\_ Date Performed: \_\_\_\_\_  
(Please print legibly)

NDE Inspector's Signature: \_\_\_\_\_

Welder's signature \_\_\_\_\_

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_