

PPPL	Princeton Plasma Physics Laboratory	PROCEDURE	ENG-059 Rev 1 page 1 of 6
Subject: Process Plan/Traveler for PPPL Built Components	Effective Date: 6/11/19	Initiated by: Head, Engineering Department	
	Supersedes: REV 0, dated 1/31/18	Approved: Deputy Director for Operations	

MANAGEMENT SYSTEM

Management System (Primary): 03.00 Engineering

Management System Owner: Head, Engineering Department

Management Process: 03.05 Engineering Programs and Processes

Process Owner: Head, Engineering Department

Sub-Process: 03.05.05 Materials and Equipment Fabrication and Preparation

Sub-Process Owner: Head, Engineering Department

Subject Matter Expert (SME): Head, Technical Infrastructure; Head, Quality Assurance (QA)

APPLICABILITY

This procedure is applicable to fabrication and manufacture of experimental components performed at PPPL. The Traveler is mandatory for items with a risk classification grade of A1 and A2, it may be waived (see Attachment 1) for A3 items when deemed unnecessary by the RE and PM.

INTRODUCTION

This procedure describes the development and use of a Traveler to plan, define, sequence, and document manufacturing process steps for fabrication, machining, welding/brazing and assembly of components at PPPL. The Traveler also includes planned inspections, hold points, and other key items related to the process. Travelers will define the most suitable process to ensure the design specifications, drawings, and other requirements specified by the Traveler Requestor are met. Drawings and any other special documents and or references not commonly available to the Shop will be attached to the Traveler. The Traveler is designed to move with, track, and document the history of the component through the entire fabrication.

DEFINITIONS

(Traveler) Requestor

The Requestor of a Traveler is the individual who request items to be fabricated and has authority to have others charge the cost center supplied, for example a COG.

Author

The Author is any member of the Shop who writes the Traveler.

CONTENTS

Required contents of a Traveler (See Attachment 2 for example):

- 1) Traveler Identification Number
- 2) Traveler Original Issue Date
- 3) Traveler Revision Date
- 4) Traveler Revision Number
- 5) Work Request Number (If Applicable)
- 6) Work Plan Number (If Applicable)
- 7) Category (A1, A2, or A3)
- 8) Job Type (Fabrication, Machining, Waterjet, Welding, etc.)
- 9) Project Name (ex. NSTX-U Recovery)
- 10) Names of Author, and Requestor
- 11) Title (should match Work Request Title, when applicable)
- 12) Planned Completion Date
- 13) Cost Center
- 14) Relevant Documents and Drawings with Revision Number
- 15) Sequential Process Steps including:
 - a. Department
 - b. Applicable Item/Part(s) and Quantities
 - c. Description of Step (ex. Machining, Welding, Hold Points, etc.)
 - d. Machine Used (If Any Used)
 - e. Operator/Inspection Initial and Date
- 16) Printed Name/Initial Legend
- 17) ECN or NCR #s
- 18) Closeout Signatures

GENERAL PROCESSING REQUIREMENTS FOR TRAVELER

- 1) All entries are to be made in ink with a signature or initials followed by the date.
- 2) All corrections to entries are to be one-lined, initialed and dated with a brief explanation of the change, if not obvious (such as entering an incorrect date).
- 3) All changes to processing steps, other than minor typo corrections, shall be done by revision ONLY (see Section C).
- 4) All personnel signing off for a processing step shall also complete the Printed Name/Initial Legend (last page of Traveler).
- 5) Once fabrication has started, the Traveler must stay with the part.

REFERENCES

QAPD, Quality Assurance Program Description
ENG-010, Control of Drawings
ENG-030, PPPL Technical Procedures
ENG-033, Design Verification
ENG-057, Project Governance Roles and Responsibilities

A. INITIAL DEVELOPMENT OF A TRAVELER

PROCEDURE
Responsibility

Action

Requestor

1. Defines the requirement (for example via a Tech Shop Work Request) and provides the cost center.
2. Ensures, with support from RE and/or COG that known hazards are identified and controls are identified, and provides the information to the Author to include in the Notes section of Traveler. This may be any special precaution and preventions associated with the manufacturing process, above and beyond precautions necessary for standard machining and manufacturing practices. These precautions may stem from use of potentially hazardous materials, and or, need for use of non-standard and/or non-customary tools, or non-standard or special purpose manufacturing processes. Additionally, the Requestor may identify hold points in the fabrication process.

Author

3. Initiates the issuance of draft of a Traveler using the approved template (Attachment 2).
4. Requests a Traveler Identification Number from the Operations Center.
5. Collaborates with the Requestor, COG, QA Representative, and any other necessary personnel to develop the work steps required to make the component and to describe the processes in the Traveler descriptions.

Note: Work steps are numbered in increments of 10 (10, 20, 30, 40) to allow for insertion of steps in future revisions (Part C). Be cautious to not combine multiple operations onto a single step with a single sign-off. For example, "clean, inspect, wrap," while done sequentially and possibly by the same individual, could just as well be distributed over personnel and even shifts and so each should have their own sign-off.

6. Distributes the draft of the Traveler to the Requestor, QA Representative, RE, and Manufacturing Technical Authority to provide this group the opportunity to review, make comments, and communicate any additional items needed on the Traveler.
7. Resolves comments and sends the Traveler to Requestor, QA, and the Manufacturing Technical Authority for final signature approval.

Requestor, QA and
the Manufacturing

8. Approve the Traveler.

Technical Authority

Author 9. Publishes the Traveler with the associated drawings attached as ready for fabrication.

Shop Supervisor 10. Ensures the lead machinist, technician, or operator has the Traveler and drawings or other pertinent documentation and directs the start of work in accordance with the Traveler.

B. USE OF THE TRAVELER

PROCEDURE

Responsibility

Action

- | | |
|-----------------------------|---|
| Technician | <p>1. Reviews Traveler steps with supervisor to make sure they have the same understanding of the work.</p> <p>2. Reviews and observes any noted job hazards and precautions noted.</p> <p>3. Begins work following Traveler requirements and in sequence defined on Traveler. Halts work and obtains help if any unexpected situation arises, parts are unavailable, if a quality issue occurs, or the work can't be performed as required by the Traveler.</p> <p>4. Calls for QC inspection/test or other test/inspection at points indicated on Traveler.</p> |
| QC Inspector | <p>5. Inspects or witnesses as required in the Traveler, records necessary quality information as indicated, and signs for the step – or issues Non-Conformance Request (NCR, per QA-005) if required and enters the NCR number in the Traveler.</p> <p>6. Places all records generated or acquired (test results, certifications, etc.) in the Traveler folder.</p> <p>7. Returns component and Traveler to the Technician to perform the next operation (if no more operations skip to Step 8).</p> |
| Technician AND QC Inspector | <p>8. Repeats steps 2 through 6 of this section, until all steps of the Traveler are completed.</p> |
| Technician OR QC Inspector | <p>9. After the final step/operation of the Traveler is completed, contacts the Shop Supervisor for review of the Traveler and final component.</p> |
| Shop Supervisor | <p>10. Reviews the final component and the Traveler – verifies that all work and inspections were completed, and the work was performed correctly then signs closeout of the Traveler.</p> |

- | | |
|-------------------------|---|
| QA/QC
Representative | 11. Verifies that all NCRs have been closed, and all Quality Related Documents and Reports are in the Traveler and completes the Closeout Signature Approval. |
| Shop Supervisor | 12. Releases the component to the Requestor if the results of Steps 10 and 11 were acceptable. |
| | 13. Makes digital copy of the completed Traveler and sends it to the Operations Center for filing (within one week of Traveler closeout completion). |

C. REVISING AN EXISTING TRAVELER

PROCEDURE

Responsibility

Action

- | | |
|------------|--|
| Technician | 1. Identifies that an existing Traveler needs to be edited, contacts the Author and Requestor to discuss the proposed changes. |
| Requestor | 2. Reviews proposed change and ensures that it is compatible with existing design, drawings, NCRs, and Engineering Change Notices (ECN, per ENG-010). If not, initiates the applicable design or requirements change process. |
| Author | 3. Modifies (red lines) Traveler to show where a stop point must occur until revisions are completed to the Traveler. The Traveler must stay with the component. If the change requires a stop work condition, the traveler is marked as STOP where work should no longer continue. |
| | 4. Indicates on Traveler the ECN and/or NCR, if any, that drove the need for changes. Increments the Traveler Revision level. |
| | 5. Follows steps 3 through 5 in <u>part A</u> of this procedure to revise Traveler. |
| | 6. Upon completion of the final approval signatures, gives revised Traveler to Technician and marks the previous revision of the Traveler as obsolete. Attaches signed-off pages of previous revision to current Traveler and indicates "see Rev. # attached" for those steps in the revised Traveler. |
| Technician | 7. Restarts component work (refer to step B.2.) at appropriate place in work flow to accommodate the changes to the Traveler. |

TRAINING

Engineering
Department

A. Target Audience: All Cognizant Individuals, Responsible Engineers, Shop Supervisors and Shop Technicians involved in manufacturing components

Instructor: Head, Technical Infrastructure Group

Training Method:

X Read only after initial roll out

X Email distribution only after initial roll out

X Briefing for initial roll out and all new affected employees

Frequency:

X Once only

X Other: As changes to procedure are made

RECORDS REQUIREMENTS SPECIFIC TO THIS PROCEDURE

Records Custodians must assure records are maintained as follows:

Record	Record Custodian	Location	Retention Time
Digital Copy of completed Traveler	Operations Center	Operations Center	See record schedule for specific record type <i>Reference: Admin 17, Cartographic, Aerial Photography, Architectural & Engineering Records (30.c.1-4)</i> <u>On Indefinite DOE Hold</u>

ATTACHMENTS

1. Sample Traveler Waiver
2. Sample Traveler

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Traveler Waiver - Sample			Attachment 1

TRAVELER WAIVER (for A-3 only)

System:

SBS-ID:

Work Request No:

Date:

Waiver Rationale:

Responsible Engineer _____ **Date:** _____

Project Manager _____ **Date:** _____

Distribution: QC Manager, Manufacturing Technical Authority, Chief Engineer, Ops Center

Princeton Plasma Physics Laboratory
Traveler / Processing Plan

Traveler Identification No.:	(Call Ops Center for #)	Issued Date:	XX/XX/20XX
Work Request No.:	20XXXXXXX	Revision Date:	XX/XX/20XX
Work Plan No. (If Applicable):	XXXX	Revision:	0
Graded Approach Classification:	A-1, A-2, or A-3	Project:	Ex. NSTX-U Recovery
Job Type:	Fabrication, Machining, Waterjet, Welding, etc.	Author:	Ex. Robert Horner

Requestor, Name and Signature: Ex. Richard Burke

QA Representative, Name and Signature: Ex. Adolfo Amaya

Technical Infrastructure Group Head, Name and Signature: Mojtaba Safabakhsh

Title or Material Description: Title of job here (to match Work Request if applicable)

Planned Completion Date: mm/dd/yyyy

Cost Center: CCCC-CCCC-CCCC

Relevant Documents, Drawings and Revisions: List reference drawings here

Notes:

Sample Traveler Form

Attachment 2

<u>STEP NO.</u>	<u>DEPT.</u>	<u>ITEM/PART</u>	<u>DESCRIPTION</u>	<u>QUANTITY</u>	<u>DURATION TO COMPLETE</u>	<u>OPR/INSP INITIAL</u>	<u>DATE</u>
10	Quality Control	A-BC12345	HOLD POINT Verify Material Certs				
20	Waterjet	A-BC12345-1, -2, -3	Cut parts according to drawing A-BC12345 sheet 2 through 4				
30	Machine Shop	A-BC12345-1	Mill slots according to drawing A-BC12345 sheet 2 Mill used _____				
40	Machine Shop	A-BC12345-4	Turn shaft according to drawing A-BC12345 sheet 3 Lathe used _____				
50	Welding	A-BC12345-1, -4	Weld parts according to drawing A-BC12345 sheet 1				
60	Quality Control	A-BC12345-01	HOLD POINT Weld inspection				
70	Machine Shop	A-BC12345-01	Machine assembly according to drawing A-BC12345 sheet 1 Mill used _____				
80	Quality Control	A-BC12345	HOLD POINT Verify Dimensions				

Printed Name/Initial Legend

Technician Name (Print):

Initial:

Inspector Name (Print):

Initial:

Technician Name (Print):

Initial:

Inspector Name (Print):

Initial:

Technician Name (Print):

Initial:

Inspector Name (Print):

Initial:

Technician Name (Print):

Initial:

Inspector Name (Print):

Initial:

Technician Name (Print):

Initial:

Inspector Name (Print):

Initial:

NCR

NCR

NCR

NCR

NCR

ECN

ECN

ECN

ECN

ECN

CLOSEOUTS, Name and Signature

Shop Supervisor Signature:

Printed Name:

Date:

QA Representative Signature:

Printed Name:

Date: