FINAL REPORT GUIDANCE

Weapons Systems and Platforms (WP) Projects

May 2018

OVERVIEW

A Final Report is a requirement of all Environmental Security Technology Certification Program (ESTCP) projects. It is a comprehensive technical report documenting the project's activities, results, and conclusions.

This document provides general guidance for writing Final Reports for projects that receive funding under the ESTCP Weapons Systems and Platforms (WP) program area. The guidance provided in this document will help to ensure that project reporting of demonstration results is consistent with ESTCP standards.

The Final Report is reviewed and must be approved by the WP Program Manager prior to publication or posting to the ESTCP web site.

The guidance provided here is general and all elements may not apply to all ESTCP WP projects. It will be the responsibility of each investigator, with concurrence of the ESTCP WP Program Manager, to decide what is most appropriate, and to what degree, for his or her site and technology.

The structure of the Final Report is similar to that of the Demonstration Plan for the project. For those projects that developed a Joint Test Protocol (JTP), a Joint Test Report (JTR) that presented the results from execution of the JTP is usually generated, but there is no requirement that the JTR be submitted to the ESTCP Office. It is expected that the results presented in the JTR should be incorporated into the Final Report in their entirety at the same level of detail.

The Demonstration Plan is not a published document, therefore all relevant information from the Demonstration Plan and JTP (if applicable) should be included in the Final Report.

Security Review

Because all Final Reports will be made available to the public via the ESTCP web site (http://www.serdp-estcp.org), a security review is required. A Standard Form 298 Report Documentation Page (SF 298) must be included in each document submission.

- For government agencies, the author will be responsible for Security and Distribution Classification review through their own agency's authority. The SF 298 should reflect the allowable distribution (i.e., unlimited public release) as determined by the clearing organization.
- For private and academic institutions, the SF 298 should be filled out to the extent possible, and ESTCP will conduct a Security and Policy Review through the Department of Defense's (DoD) Directorate for Freedom of Information and Security Review (FOISR).

All Final Reports should have the statement, "**Approved for public release; distribution is unlimited**" on the SF 298. If any portion of the ESTCP-sponsored work requires limited

distribution (i.e., proprietary, classified, or other distribution limitations), the principal investigator (PI) should contact the WP Program Manager for guidance.

The reports will be posted on Defense Technical Information Center (DTIC) (http://www.dtic.mil). Federal organizations are responsible for ensuring that their publications are forwarded to DTIC. The ESTCP office will submit all non-DoD organization reports to DTIC.

Format

Final Reports are intended for publication. As such, ESTCP expects them to be professionally written and properly edited, equivalent to what would be submitted to an archival, peer-reviewed scientific or technical journal. The following general formatting parameters are recommended:

Cover	Include ESTCP project name and number, your organization's project number (if applicable), date (month/year), document version number, and the name(s) of the author(s) and their organization. (See last page of this guidance for a sample cover)
Font	Times New Roman proportional font
Cover Main Title (words "FINAL REPORT")	26 pt, bold, centered
Cover Title (Title of project)	20 pt, bold, centered
Section headings	14 pt, bold, centered
Subsection headings	12 pt, bold, flush left
Text	12 pt
Margins	1" top, left, right, bottom
Page numbering	Bottom center Cover page: none Front matter: i, ii, iii, iv… Body of document: 1, 2, 3, 4…
Word processing software	Use either Microsoft Word or provide a PDF document.
Figures (including photographs, charts, graphs, etc.) and Tables	Insert in the document on the same or first page following the first reference. Liberal use is highly recommended.

Each figure and table must have a caption (table caption above the table and figure caption below the figure) and must be referred to in the text.

References should be numbered. When cited in the document, the number should be placed full-size in brackets (e.g., [2]).

How to Submit a Draft Final Report

Final Reports must be submitted to the ESTCP Support Office. The report may be sent using ***one of the methods*** indicated below:

- For files that are 100MB or less: Submit the report in SEMS 2.0 (https://sems2.serdp-estcp.org). Follow the instructions below for uploading your document:
  - From the project dashboard, click "Overview & Plan" in the left-hand panel, then click "Project Plan".
  - Scroll down to the document milestone and click "Upload" in the milestone box.
  - Select the file you would like to upload and click the "Upload" button.
  - Click "Submit" in the bottom right corner of the milestone box.
- For files larger than 100MB: Contact serdp-estcp.documents@noblis.org to receive an email with the web link that will allow access to the system to upload your file(s). Please make sure you include the project number and the title(s) of the document(s) to allow identification of your files.

Please do not submit reports directly to the ESTCP Program Manager.

Section-by-Section Final Report Guidance

Cover Page: Include the Demonstration title, ESTCP project number, your organization's project number (if applicable), date (month/year), document version number, and the name(s) of the author(s) and their organization. (See last page of this guidance for a sample cover).

Standard Form 298 Report Documentation Page: Include report date, type, title, author(s), contract number, project number, performing organization name and address, abstract, subject terms, number of pages, and name and phone number of responsible person.

Front Matter: Provide a Table of Contents and lists of Acronyms, Figures, and Tables.

Acknowledgments: State the individuals and/or organizations that contributed to the demonstration project and the generation of the Final Report.

Abstract: Provide a one page abstract with the following sections:

- Introduction and Objectives
- Technology Description
- Performance and Cost Assessment
- Implementation Issues
- Publications

The abstract will be used to update the project web page.

Executive Summary: Provide a 5 to 10 page extended Executive Summary. The Executive Summary will be posted as a stand-alone document on the SERDP & ESTCP web site. It should include key graphics and tables from the Final Report. Include the following sections:

- Introduction
- Objectives
- Technology Description
- Performance Assessment
- Cost Assessment
- Implementation Issues

1.0 INTRODUCTION

This section is intended to provide a general overview of the project. Specific subsections as described below should be included in this section.

1.1 BACKGROUND

Describe the environmental problem that was addressed in the project and its impact on Department of Defense (DoD) operations. Briefly describe the technology that was demonstrated and its potential benefit compared to conventional practices and alternatives. (This will be expanded upon in Section 2.1, Technology Description.)

1.2 OBJECTIVE OF THE DEMONSTRATION

Describe the overarching objectives of the demonstration, such as to validate the technology in the field or in a real-world industrial setting at the appropriate scale of operation (pilot, prototype, or full-scale), or to transfer the technology to an end user. Explain the environmental, safety, and occupational health (ESOH) benefits of the technology that was demonstrated. In this section, include Table 1 from the Demonstration Plan listing the targeted hazardous material, the process in which it is currently used, applications in which the material or process is currently used that were addressed with the alternative technology, current specifications covering the existing process, the affected weapons programs, and the candidate parts and substrates on which the current material or process is being used that were addressed in the demonstration.

1.3 REGULATORY DRIVERS

State the existing or anticipated federal, state, or local regulations, or DoD directives that have resulted in a need for this innovative technology. Any international regulations that may have an impact on DoD operations should be described as well.

2.0 DEMONSTRATION TECHNOLOGY

This section is intended to provide an overview of the technology that was demonstrated. Reference to existing papers and reports is highly encouraged.

2.1 TECHNOLOGY DESCRIPTION

- Describe the technology in sufficient detail to provide an accurate and factual understanding of its theory, functionality, and operation.
- Provide an overall schematic diagram of the technology. Include one or more photographs or drawings of the equipment involved in the new technology.
- If the technology being demonstrated involves a new method or process, provide a flowchart showing the various steps in the process.
- Provide a chronological summary of the development of the technology to date, including developments prior to initiation of the project and during the execution of the project.
- Describe expected applications of the technology.

2.2 TECHNOLOGY DEVELOPMENT

Provide a description of all research and development conducted on the technology prior to initiation of the ESTCP project. If this work has been published in one or more separate technical reports, provide a summary and reference the reports. If not, this section should be sufficiently detailed to fully describe the work done and results obtained. Use of graphics is encouraged to aid the reader in understanding the results.

2.3 ADVANTAGES AND LIMITATIONS OF THE TECHNOLOGY

State the advantages and limitations of the technology and compare these with the advantages and limitations of currently used and other alternative technologies. These should include issues of cost, military performance, and environmental issues. Identify any prominent alternative technologies.

This section should be updated from the equivalent section in the Demonstration Plan to include any advantages or disadvantages as noted during the demonstration.

3.0 PERFORMANCE OBJECTIVES

Performance objectives are the primary criteria established by the investigator for evaluating the innovative technology. They provide the basis for evaluating the performance and costs of the technology. Meeting these performance objectives is essential for successful demonstration and validation of the technology. This section should provide an accurate summary of the performance objectives, whether they were met and, if not met, the principal reason for failure.

Table 2 from the Demonstration Plan (modified to reflect any changes made during execution of the project) should be inserted into this section, with an additional column added on the right with the heading "Results," as indicated below. This column should indicate whether the success criteria were met.

Table 1. Performance Objectives.
[SAMPLE ONLY—Performance objectives must be specific to the technology being demonstrated.]

Performance Objective	Data Requirements	Success Criteria	Results
Quantitative Performance Objectives			
Product Testing - Corrosion testing - Fatigue testing - Bonding capability	• The American Society for Testing and Materials (ASTM) test number, MIL-SPEC number or customized tests • Test data collected on components produced in depot as part of the demonstration and on coupons produced for the JTP	As described in JTP (Appendix A) Field performance requirement	
Product Testing Energy release (for energetic material)	• ASTM test number • MIL-SPEC requirement • Customized tests on material produced for JTP	As described in JTP (Appendix A)	
Product Testing Energetic release (for full up item)	• MIL-SPEC requirement o Field demonstration	Equivalent to existing items	
Reduction of hazardous waste generated	• Raw materials usage, mass balance • Analysis for hazardous materials by EPA standard test number during demonstration	>90% reduction from current process	
Decrease in production rates	Tracking of production time in demonstration	>50% reduction versus baseline characterization	
Qualitative Performance Objectives			
Ease of use	Feedback from field technician on usability of technology and time required during demonstration	No operator training required	

In addition to Table 1, for each performance objective there should be a narrative description that provides the following:

- An explanation of the objective and its relevance to the demonstration
- A description of the metric that was used to assess whether the objective was met
- Criteria that were used to determine success (i.e., for quantitative objectives, the metric threshold value) and to what extent the success criteria were met.

Please note that equivalent information should be provided for each performance objective. It is recognized that related performance objectives may have similar data acquisition needs. As a result, reference can be made to these earlier descriptions rather than repeating information. Qualitative performance objectives, though perhaps lacking a relationship to specific units of measure, may still require some level of data collection and analysis. This format also should be used for qualitative performance objectives as appropriate.

4.0 SITE/PLATFORM DESCRIPTION

This section should provide a concise description of the selected demonstration sites and/or platforms. It should include information that is relevant to understand the results of the demonstration. Specific subsections below are intended to capture relevant information; however, include any other information that has immediate bearing on the demonstration.

4.1 TEST PLATFORMS/FACILITIES

Identify the selected sites or platforms. Describe which weapons systems, support vehicles, or equipment are produced at or serviced by the facility.

4.2 PRESENT OPERATIONS

Describe the current industrial process operations for the activities or applications that the technology is intended to replace. Provide an overview of the process in which the technology to be demonstrated will reside. As appropriate, provide schematics or layout drawings, and describe the characteristics of the process stream or maintenance activities. Describe any existing operations at the test site(s) that may have impacted the demonstration.

4.3 SITE-RELATED PERMITS AND REGULATIONS

To the extent that they would be relevant to future implementation of the demonstrated technology at other sites or on other weapons systems, identify any permits that were required for the demonstration or regulations that impacted the demonstration.

5.0 TEST DESIGN

This section provides the detailed description of the system design and testing that was conducted to address the performance objectives described in Section 3. In other words, the description of all types of testing (laboratory, field, "real-world") that were done in the demonstration should be inserted in this section. Descriptions here should be sufficiently detailed such that a technician or engineer could potentially reproduce the testing. In addition, the location of the tests and the organization that performed the tests should be indicated.

If a JTP was developed as part of the project, then Subsection 5.1 should describe all of the testing performed under the JTP, at the same level of detail as in the JTP, with sub-subsections in the Final Report correlating to the subsections from Section 3 of the JTP. Tables 2 and 3 from the JTP (modified as necessary) should be reproduced in this subsection to summarize the common and extended performance testing that was conducted.

If a JTP was not developed as part of the project, but laboratory testing was conducted, then Subsection 5.1 should describe in detail the types of laboratory tests that were performed. A summary table of the different tests should also be provided.

Subsection 5.2 should describe in detail all of the field, real-world and other non-JTP testing that was performed. Information should be extracted from Section 5 of the Demonstration Plan and modified as necessary.

Note that this section describes only what laboratory, field, or real-world testing was performed. Results of such testing should be presented in Section 6.

6.0 PERFORMANCE ASSESSMENT

This section presents the results of all of the testing. It should be structured similarly to Section 5, with one subsection covering laboratory testing and a second subsection covering the field or real-world testing. Liberal use of charts, diagrams, and graphical representations of data are strongly encouraged. Extensive tables of numerical data can be placed into an appendix.

As noted earlier, if a JTR was prepared during execution of the project, then the description of the results of the tests as reported in the JTR should be placed into Section 6.1 at the same level of detail.

Describe the statistical procedures and tests applied for analyzing the data and determining statistical significance, especially when comparisons with data from current or alternative technologies are needed or comparisons to success criteria are sensitive to variances in the data and sample size.

This section should include a discussion of whether the success criteria were met for each of the performance objectives. If the success criteria were not met, then reasons should be explored and potential modifications or solutions should be discussed to ensure that the criteria are met. If success criteria were exceeded, then the potential impact of the enhanced performance should be discussed. (For example, if an alternative coating has superior corrosion performance compared to the currently used coating, then potentially the time-between-overhaul on a weapons system could be increased).

Please note that equivalent subsections should be provided for each performance objective. It is recognized that related performance objectives may have similar data analysis. As a result, reference can be made to earlier subsections rather than repeating all information.

7.0 COST ASSESSMENT

This section should provide sufficient cost information that an engineering professional could reasonably estimate costs for implementation of the alternative technology and its life-cycle costs as compared to the currently used approach. In addition, this section should provide a discussion of the cost benefit of the technology. The following subsections with detailed discussions and examples should be provided.

7.1 COST MODEL

This section should build upon the information provided in Section 6 of the Demonstration Plan, with modifications as necessary. A detailed description of the activity-based costing methodology or other methodology used in the cost assessment should be provided. The use of references is strongly encouraged. Identify the cost elements associated with replacing the existing technology with the alternative technology and list the cost data that were tracked during the demonstration. Identify any outside organizations, companies or consultants that were used to identify cost elements, track costs, or develop a cost/benefit analysis.

Identify any assumptions factored into cost/benefit calculations such as future reduced environmental, safety or occupational health costs, or potential reduced costs associated with improved performance of the alternative technology.

7.2 COST ANALYSIS AND COMPARISON

This section should provide realistic estimates for the costs of the alternative technology when implemented operationally. Table 3 from the Demonstration Plan should be included in this section, with actual costs filled in, for both the currently used technology and the alternative technology.

Provide a description of how each applicable cost element can be used to estimate the life-cycle costs for implementing and operating the demonstrated technology. Include the following considerations: (1) facility capital cost, (2) start-up and operations and maintenance costs, (3) equipment replacement costs, and (4) re-processing or re-application costs. Clearly define the time frame for the life-cycle cost estimate.

This section should include net-present-value calculations for implementation of the alternative technology over different time periods. A discussion and assessment of the life-cycle costs for the technology should be presented.

8.0 IMPLEMENTATION ISSUES

This section should provide information that will aid in the future implementation of the technology. Identify the stakeholders (individuals and organizations) who will potentially be involved in approving the implementation of the alternative technology. Describe the requirements and decision process that will lead to ultimate acceptance of the technology. If any of the success criteria were not met, describe the potential impact on transitioning the technology.

Discuss how any environmental or worker safety regulations, current or proposed, might impact the implementation of the alternative technology.

Discuss procurement issues (whether equipment required for implementation would be commercial-off-the-shelf [COTS] or a custom-built prototype), ease of production and scale-up issues. To what extent was the technology customized for the demonstration? Indicate whether there are any proprietary or intellectual property rights issues associated with the technology.

Discuss planned technology transfer efforts that will be conducted after conclusion of the demonstration. Also discuss potential opportunities for technology transfer to other platforms, depots and the OEM community.

9.0 REFERENCES

List all references cited in the Final Report. This list may include published reports, articles, data sources, and web sites. References should be properly cited using standard bibliographic formats so the reader can access the information. Oral presentations and unpublished reports are not acceptable references. Private communications are acceptable, but the reference must provide the name, organization, and contact information (phone number or e-mail address) of the individual and the date of the communication.

APPENDICES

Appendix A: Points of Contact

List all the important points of contact (POC) involved in the demonstration, such as co-investigators, sponsors, industry partners, and regulators. The list should include the following information: (1) full name; (2) complete mailing and FedEx addresses (if different); (3) telephone number, fax number, and e-mail address; and (4) the role of the individual in the project.

Use the tabular format below:

POINT OF CONTACT Name	ORGANIZATION Name Address	Phone Fax E-mail	Role in Project

Additional Appendices

As needed, provide additional appendices for items such as:

- Detailed data sets from performance testing
- Detailed data related to cost calculations.

Sample cover page

FINAL REPORT

Replacement of Hazardous Materials in Weapons Systems

ESTCP Project WP-xxxxxx

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Army Research Laboratory

Jane Smith
Naval Air Systems Command

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Air Force Materiel Command

Version 1

January 2017