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Guide to Preparing SAND Reports and Other Communication Products

Version 6, February 2009

Prepared by
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ABSTRACT

This guide describes the R&A process, Common Look and Feel requirements, and preparation and publishing procedures for communication products at Sandia National Laboratories. Samples of forms and examples of published communications products are provided.

PREFACE

This guide takes advantage of the wealth of material now available on the Web as a resource. Therefore, it is best viewed as an electronic document. If some of the illustrations are too small to view comfortably, you can enlarge them on the screen as needed.

For more information, contact pwbritt@sandia.gov or CreativeArts@sandia.gov.

The format of this document is considerably different than that usually expected of a SAND Report. It was selected to permit the large number of illustrations and examples to be placed closer to the text that references them. In the case of forms, covers, and other items that are included as examples, a link to the Web is provided so that you can access the items and download them for use.

When you print two-sided copies of the document, you will have two options for binding:

- Binding on top margin
- Binding on side margin

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INTRODUCTION

I.1 Getting Help
I.2 Sandia Support Services
I.3 Corporate Policies

This guide details the processes for producing a variety of communication products at Sandia National Laboratories. Figure I-1 shows the general publication development process. Because extensive supplemental material is available from Sandia on the internal web or from external sources (Table I-1), the guide has been shortened to make it easy to find information that you need.

Table I-1. Useful References

Style and General Reference Guides	
Microsoft Manual of Style for Technical Publications	Good guide to computer/ software content.
Chicago Manual of Style	Traditional academic press style guide. Most style guides are derived from it.
U.S. Government Printing Office Style Manual	The standard for many government agencies. http://www.gpoaccess.gov/stylemanual/browse.html
Elements of Style	Classic writing instruction.
Webster's Eleventh New Collegiate Dictionary	Also contains style guide.
The American Heritage Dictionary	Also contains style guide and usage notes for troublesome words.
Guide to Grammar and Writing	http://grammar.ccc.commnet.edu/grammar/

Sandia/DOE Resources	
Presentation Templates	Creative Arts - 3654
Acronyms, Initialisms, and Abbreviations	http://infoserve.sandia.gov/electronic/sandsearch.html
Logos, corporate signature, and insignia	Creative Arts Resources
Review and Approval General Information	http://www-irn.sandia.gov/recordsmgmt/revapprov/revapprov.htm
Electronic Review and Approval Application	https://cfwebprod.sandia.gov/cfdocs/RAA/templates/
External Web Publishing Review and Approval	Sandia Web Publishing Guidelines home page
Common Look and Feel Examples	http://www-irn.sandia.gov/organization/div12000/ctr12600/newctr12620/clfproducts.html
Writer's Guide for Technical Procedures (DOE)	http://www.eh.doe.gov/techstds/standard/std1029/s1029cn.pdf
DOE Portion Marking	http://www-irn.sandia.gov/security/dept/classification/doemarkinghb2006.swf

Bartleby.com is an excellent online resource for some of the more common reference books, including Strunk's *The Elements of Style*. Some agencies have their own style guides and unique document requirements, and authors should be sure that they are working with the latest editions.

I.1 Getting Help

All the Sandia organizations involved in the Review and Approval and publications process are available to assist you if you need help. Table I-2 lists some of these contacts. The

Sandia Creative Group (NM) or the Public Relations and Strategic Communications Group (CA) are good sources of authoritative information on your publications concerns.

Table I-2. Useful SNL Contacts

Department	Phone	Mail Stop
New Mexico (505)		
Classification and Export Control	844-5574	0175
Classified Matter Protection and Control	844-0432	0166
Sandia Creative Group*	844-6416	0619
Legal Intellectual Property	845-9536	0601
Printing Services*	284-3475	0617
Review and Approval Desk	845-8220	0612
Technical Library Imaging Services	844-0774	0899
Technical Library Reference Services	845-8493	0899
Video Services*	844-7167	0650
*Lab Communications Service Centers		
California (925)		
Security Operations	294-2202	9021
Legal Intellectual Property	294-3690	9031
Printing/Publishing	294-4555	9131
Public Relations & Strategic Communications http://www.ran.sandia.gov/CaLabCom/LabComCA.html	294-4555	9131
Technical Library Reference Services	294-3442	9211
Video Services	294-4555	9131

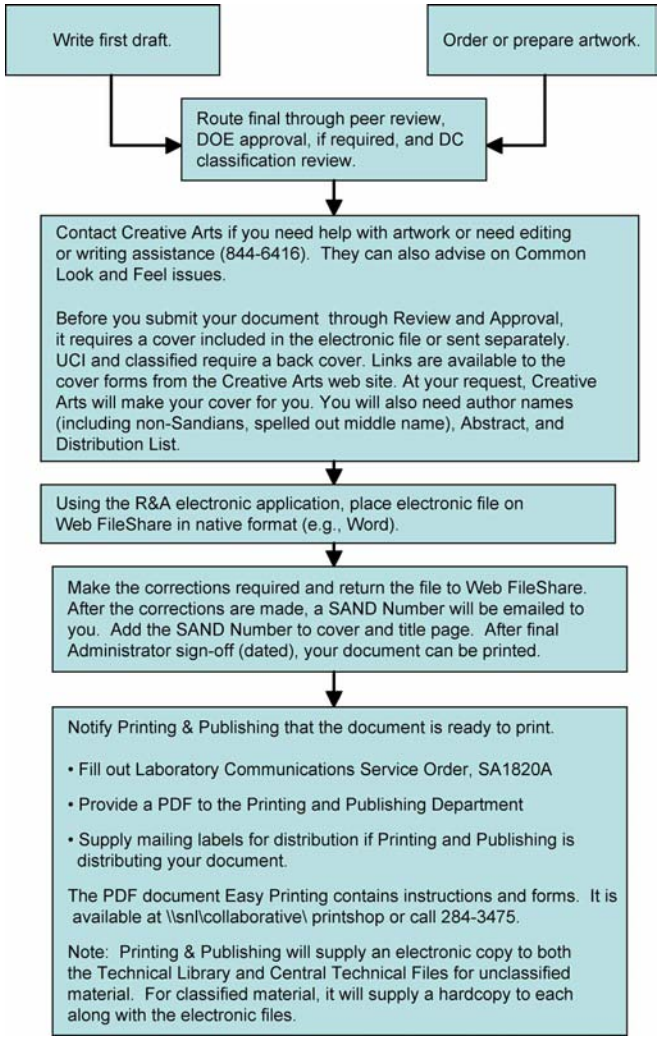


Figure I.1. Flowchart for Creating SAND Reports Using Electronic Review and Approval

I.2 Sandia Support Services

The Sandia Creative Group (NM) (or Public Relations and Strategic Communications group in CA) can assist you in taking your publication from conception through publication. Their staff can provide writing and editing support and assist you in preparing the document for submission to Review and Approval, incorporation of Common Look and Feel elements, and proper marking for various kinds of release. They can advise you on printing arrangements, quality checks, and distribution. The illustrators are experienced in producing high-quality artwork for everything from traditional SAND Reports to electronic publications. They will be happy to consult with you to determine the right look and the right medium for your message.

To obtain writing or design services, prepare Form SA 1820-A (Figure 1-2; Sandia/CA uses an online form), attach your draft, and send or hand-carry the request to the Customer Service Desk in the Sandia Creative Group. The online form for the CA laboratory is located at:

http://www.ran.sandia.gov/prsc/work/index.html

Classified artwork and disks may be hand-carried to the Sandia Creative Group, and proper documentation of classified information must be included. On Form SA 1820-A, fill in the Complete for Classified Work section.

The Sandia Creative Group can also receive classified documents through the Sandia Classified Network. To reduce classified media, electronic transmittal is preferred. Do not send electronic files without first making prior arrangements with the Sandia Creative Group.

Printing Services provides traditional and digital photography for authors who would like to have professional photographs taken for their reports. Color photographs intended for black-and-white reproduction should be checked to determine whether they will reproduce properly. Sandia/NM printing instructions are online at:

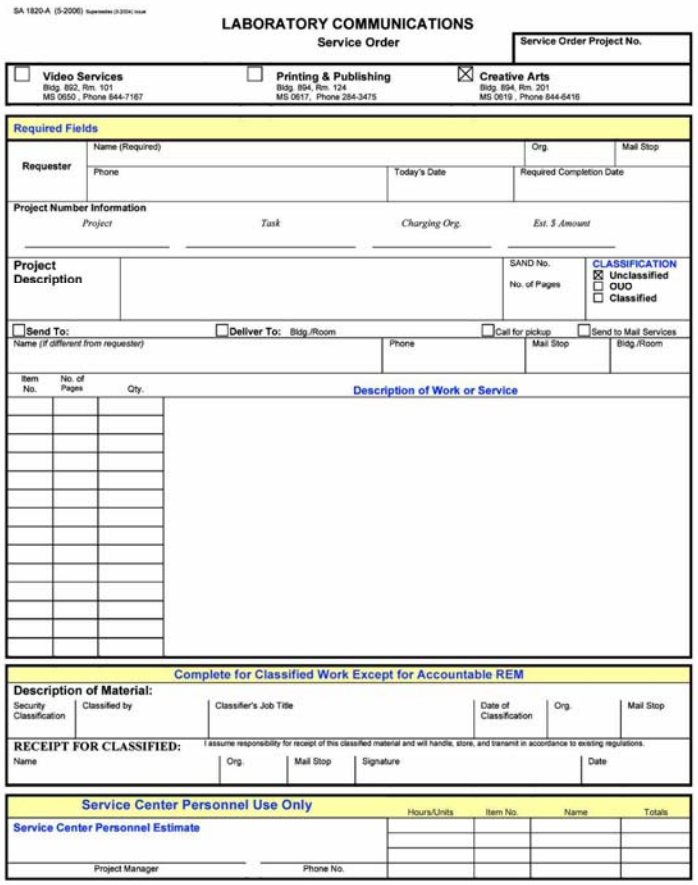
Printing and Publishing Department Publishing Processes

Professional video services are available in both California and New Mexico to provide script writing and production assistance.

The Technical Library maintains the archival copy of SAND Documents (CPR400.2.13.14 Att. A) to which authors can point colleagues, customers, or Web pages for unlimited release documents.

Technical Library Reference Services can assist authors with research, citation verification, bibliographic formatting, etc. Contact your reference librarian for assistance:

http://infoserve.sandia.gov/services/reflib.html



SA 1820-A (5-2006)

LABORATORY COMMUNICATIONS
Service Order

Service Order Project No.

☐ Video Services
Bldg. 892, Rm. 101
MS 0650 , Phone 844-7167

☐ Printing & Publishing
Bldg. 894, Rm. 124
MS 0617, Phone 284-3475

☒ Creative Arts
Bldg. 894, Rm. 201
MS 0619 , Phone 844-6416

Required Fields

Requester: Name (Required) | Org. | Mail Stop
Phone | Today's Date | Required Completion Date

Project Number Information
Project | Task | Charging Org. | Est. $ Amount

Project Description | SAND No. | No. of Pages

CLASSIFICATION
☒ Unclassified
☐ OUO
☐ Classified

☐ Send To: ☐ Deliver To: Bldg./Room ☐ Call for pickup ☐ Send to Mail Services
Name (if different from requester) | Phone | Mail Stop | Bldg./Room

Item No. | No. of Pages | Qty. | Description of Work or Service

Complete for Classified Work Except for Accountable REM

Description of Material:
Security Classification | Classified by | Classifier's Job Title | Date of Classification | Org. | Mail Stop

RECEIPT FOR CLASSIFIED: I assume responsibility for receipt of this classified material and will handle, store, and transmit in accordance to existing regulations.
Name | Org. | Mail Stop | Signature | Date

Service Center Personnel Use Only
Service Center Personnel Estimate
Project Manager | Phone No.
Hours/Units | Item No. | Name | Totals

Figure I-2. Laboratory Communications Service Order SA 1820-A. http://www-irn.sandia.gov/corpdata/corpforms/1820a.dot

I.3 Sandia Corporate Policies

Sandia has many corporate policies that provide guidance for producing, marking, and releasing documentation. Many of these are referenced in this document, or you can search the corporate policies for those that apply.

1. POLICIES AND REQUIREMENTS

1.1 Department of Energy Directives
1.2 Copying/Printing of Drafts and Masters
1.3 Policies for Protecting Official Information
1.4 Physical Protection of Documents
1.5 References to Sandia
1.6 Funding Statement
1.7 Copyright Statement
1.8 Disclaimer of Liability
1.9 NNSA
1.10 General Provisions of the Government Printing & Binding Regulations

1.1 Department of Energy Directives

Department of Energy (DOE) Directive G 241.1-1A provides the requirements for preparing scientific and technical information. DOE Manual 475.1-1B (Section 6) requires classification review prior to public release or widespread internal release of Sandia information.

1.2 Copying/Printing of Drafts and Masters

In accordance with DOE and the Joint Committee on Printing, all printed or copied documents **must** be published through Printing Services (NM) and Public Relations & Strategic Communications (CA).

Promotional materials require review for adherence to Common Look and Feel guidelines (Section 3). Color copies and printing no longer require DOE approval. The author is responsible for obtaining necessary permissions to reprint copyrighted material (refer to Section 6.1).

Drafts may be reproduced through Printing Services. Contractors may produce a limited number of copies of draft SAND Reports. All draft copies must be labeled DRAFT in both the header and footer on every page.

NOTE
You may be subject to severe personal penalties if you do not adhere to the printing and copying policies. If you have a printing or copying question, you are encouraged to contact Printing Services (284-3475).

1.3 Policies for Protecting Official Information

The appropriate protection that must be applied to different types of communication products may include the following:

Physical protection while the communication product is being produced.

Special markings applied to the communication product, when appropriate. Sensitivity and Distribution limitations corresponding to the markings.

Unclassified Unlimited Release – Information that has been officially reviewed through R&A and has no sensitivity or distribution limitations.

Unclassified Controlled Information (UCI) – Unclassified but sensitive information, e.g., Unclassified Controlled Nuclear Information (UCNI), Official Use Only (OUO), Naval Nuclear

Propulsion Information (NNPI), and sensitive information owned by Sandia Corporation. UCI requires physical protection and marking with sensitivity statements.

Classified – Classified information requires physical protection during preparation (accountability) and appropriate security markings. Classified media require special handling.

Refer to Appendix A for a quick reference to the markings for UCI and classified reports. The Sandia guidance on OUO is located at:

CPR400.2.20, Management of Information Throughout Its Life Cycle

1.4 Protection of Documents

Physical Protection of Unclassified Controlled Information

Maintain physical control of document at all times while working on it. Never leave it unattended in an uncontrolled area. Be sure that all individuals accessing the document have a need to know and appropriate clearances.

Store document in a secure container (locked desk or equivalent) or controlled office area or facility (vault) when not in use.

Destroy working papers such that they cannot be reconstructed (e.g., shredding). Cover sheet SF 1008-UCN (for UCNI) is optional within Sandia. SF 1008-UCA (for UCI) may be used to protect OUO and other types of UCI within Sandia.

Do not place UCI on the corporate Drop Zone. Printing Services has a special Drop Zone file in which UCI may be placed for printing.

NOTE

Classified drafts and working papers have marking and retention requirements. Check with your CAS to be sure that you are in compliance. Refer to CPR 400.3.12, Management of Classified Matter for guidance on marking drafts.

Physical Protection of Classified Documents

Destroy working papers such that they cannot be reconstructed (e.g., classified shredder).

Make sure that personnel with access to classified documents have the appropriate security clearance and a need to know for the specific information.

Maintain physical control of document at all times. Store classified documents in a DOE-approved locked safe or vault when not in use.

Use properly marked front and back cover sheets on each copy of the draft document and on the masters. Drafts should be appropriately marked.

OPSEC

During the process of creating a SAND Report, consider using Operations Security (OPSEC) principles to protect sensitive information surrounding the program. OPSEC is a countermeasures program to prevent foreign intelligence agents, criminals, terrorists, or other adversaries from obtaining classified, critical, or sensitive information about programs and activities. Sensitive Information includes both classified and unclassified information. While classified information has clear and defined protection measures, sensitive unclassified information is not afforded the same level of protection. Understanding the value of sensitive information and taking steps to protect that information from inadvertent release is the principal function of the OPSEC Program.

1.5 References to Sandia

Use the official corporate name, Sandia Corporation, in legal and official situations (e.g., leases, contracts, and formal documents). In *formal* reference, Sandia National Laboratories, Sandia National Laboratories/New Mexico, and Sandia National Laboratories/California are acceptable. "Albuquerque" and "Livermore" are no longer used to refer to the different sites. In *informal* reference, Sandia, Sandia/NM, and Sandia/CA are acceptable. SNL/NM and SNL/CA may be used when brevity is required. The facilities may also be referred to as the "California laboratory" or the "New Mexico laboratory."

1.6 Funding Statement

If the work was funded by the DOE, the DOE-Sandia funding statement must appear on the cover and credit the current contract number as follows:

> Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under Contract DE-AC04-94AL85000.

Reference: Creative Arts Resources

If another government agency or company contributed all or part of the funding, appropriately indicate that on the title page.

Covers available on the Sandia Corporate Forms site or provided by the Sandia Creative Group contain the DOE funding statement.

http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand
under SAND Report Covers

1.7 Copyright Statement

DOE requires the following on all submissions to publishers and on copyright transfer forms (refer to Section 6.1):

> The submitted manuscript has been authored by a contractor of the U.S. Government under contract No. *(insert the contract number)*. Accordingly, the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U.S. Government purposes.

1.8 Disclaimer of Liability

This statement is used for public communications conveying information that might be relied on by the public for research, product development, experiments, etc.:

> This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represent that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, any agency thereof, or any of their contractors or subcontractors. The views and opinions expressed herein do not necessarily state or reflect those of the United States Government, any agency thereof, or any of their contractors.

This statement is included on the second page of SAND Report covers and is provided on the covers available on the Sandia forms site.

Reference: Creative Arts Resources

1.9 NNSA

Appropriate first use is "U.S. Department of Energy, National Nuclear Security Administration (NNSA)." Thereafter use either the acronym, the name spelled out, or "the Administration." See Section 3, Common Look and Feel, for instructions on how to handle the NNSA logo.

1.10 General Provisions of the Government Printing & Binding Regulations

Commercial Advertisements – SAND Reports are considered Government Publications (Creative Arts Resources), and as such, they shall not contain any advertisement inserted by or for any private individual, firm, or corporation, nor shall they contain any material that implies in any manner that the Government or Sandia endorses or favors any specific commercial product, commodity, or service.

Art Signatures – Printed representations of original works of art included in SAND Reports may include the signature if it is not out of proportion or relation to the design. Signatures of technical illustrators, designers, typographers, or layout artists shall not be included in the printed representations.

Courtesy Credit Lines – Courtesy credit lines are permissible **only** for copyrighted materials that are contributed or loaned by nongovernmental parties for inclusion in SAND Reports. Such credit lines shall be subordinate in size of type to that of both the general text of the document and that used for legends for illustrations. When all the material contained comes from a single nongovernmental source, credit lines may be included within the general text of the document but not in a separate paragraph specifically displayed for the purpose of acknowledging credit.

Publication Bylines – Publication bylines **may** be provided **only** to the authors of the articles appearing in the SAND Report, and to the photographers who have originated any pictures contained

therein. Such bylines **shall** be printed in exact juxtaposition with the articles or pictures that they have created.

Publication Mastheads – Printed mastheads identify the Department of Energy, the NNSA, and the name of specific Field Office issuing the publication (if required) together with the name of the head of the Department of Energy and the name of the head of the Field Office issuing the publication. Additional names include only the names of the executive or managing editor, sports editor, feature editor, photo editor, and art editor, or their editorial equivalent officers by whatever title they are identified.

Color Printing Criteria – The use of color printing in SAND Reports **is permitted** subject to the Sandia Review and Approval process.

Illustrations – Illustrations may be used in SAND Reports if they:

- Relate entirely to the transaction of the business of Sandia and are in the public interest,
- Relate to the topic and are necessary to explain the text,
- Do not aggrandize any individual,
- Are in good taste and do not offend proper sensibilities,
- Are restricted to the minimum size necessary, or
- Illustrate employees engaged in an act or service related to their official duties.

2. REVIEW AND APPROVAL

2.1 Formal and Programmatic/Organizational Review and Approval
2.2 SAND Numbers for New Communication Products
2.3 Review and Approval Procedure
2.4 Reuse of Previously Approved Materials

2.1 Formal and Programmatic/ Organizational Review and Approval

The Review and Approval (R&A) Process ensures that information released is professional, reviewed for classification, and marked appropriately. Every communication product going outside Sandia, as well as internal communications with widespread distribution, is considered an official Sandia information product and requires appropriate review and approval. Even if only one Sandia employee co-authors a report with contractors, the report is considered a Sandia Report. A contractor report documents work done under a Sandia purchase order by an external entity such as a consultant or a company and is authored by that entity.

NOTE

SAND numbers are issued after corrections identified in R&A have been made.

See the Choosing a Review Process Web page for detailed Review and Approval instructions.

The two Review and Approval processes used at Sandia are the following:

Formal Review and Approval – Information released outside Sandia is assigned unique SAND numbers and must be reviewed. The R&A process and the assignment of SAND numbers are coordinated through the Recorded Information Management Department. (At Sandia/CA, Security Operations, Classifications Office, coordinates these functions.) The approval process is documented using the R&A electronic application: https://cfwebprod.sandia.gov/cfdocs/RAA/templates/

Progammatic/Organizational Review and Approval – The Organizational or Programmatic Review and Approval process is allowed for releasing information to a controlled audience. Many Centers have developed their own policy and forms for Organizational or Programmatic Review. However, the process must obtain documented approval from a Derivative Classifier and a designated Line Manager. These releases are not assigned SAND numbers. Before the information is released, it is recommended that the originating organization consult with the Legal Intellectual Property Center if the release is scientific and/or technical in nature and the Classification and Export Control Department (4225) or Security Operations (8511) in CA if it is a potentially sensitive subject area. Documentation of the approval is also recommended using Record of Organizational or Programmatic Review for Information Release: http://www-irn.sandia.gov/corpdata/corpforms/1008rao.doc

To determine which process is required for your communication product, you may use the R&A Wizard: http://www-irn.sandia.gov/rev_app_wiz/

2.2 SAND Numbers for New Communication Products

SAND numbers (e.g., SAND2005-1234) are used to track official releases of Sandia information. Official releases are information that reflects or represents policies, operations, and activities. SAND numbers consist of the year, the sequential number of the document, and, when appropriate, a suffix for the type of communication product. SAND numbers for the years 2000 and beyond use four digits for the year.

In the electronic applications, SAND numbers are issued and emailed to the requestor after the changes required as a result of R&A have been made. Table 2-1 lists the types of communications products and an example of the appropriately suffixed SAND number for each.

SAND Reports that do not have the typical components of a SAND Report (e.g., promotional materials that may have customized covers) may be published with the "P" suffix.

Table 2-1. Types of SAND Communication Products

Document Type	Suffix	Example
Abstract (brief or extended)	A	SAND2005-1112A
Conference Paper /Conference Presentation	C	SAND2005-1112C
Electronic Posting/Web Site	W	SAND2005-1112W
Journal Article	J	SAND2005-1112J
SAND Report	None	SAND98-1112
Other reports, Viewgraph/Presentation, Brochure/ Newsletter/Fact Sheet, Exhibit/Poster/ Display, Video/DVD, Book/Book Chapter	P	SAND2000-1112P

To disseminate a memorandum outside Sandia, format it into an official SAND Report and send it through full R&A. An electronic copy of an internal memorandum should be sent to the Technical Library.

2.3 Electronic Submission of Unclassified Unlimited Release and Unclassified Limited Release

Always check the R&A Web Page for current process instructions. Figure 2-1 illustrates the electronic R&A process.

Use the Web application to submit documents that might be unclassified unlimited release and unclassified limited release communication products for R&A. The Web form may be printed out to accommodate documents that are sent through R&A in hardcopy.

NOTE

Do not use this procedure for classified material. For classified R&A see Section 2.5, Classified Hardcopy Routing.

The Technical Library provides full-text access to unlimited-release SAND Reports and those with a P suffix. Sandians can see those with C and J suffixes, but external access is limited to metadata.

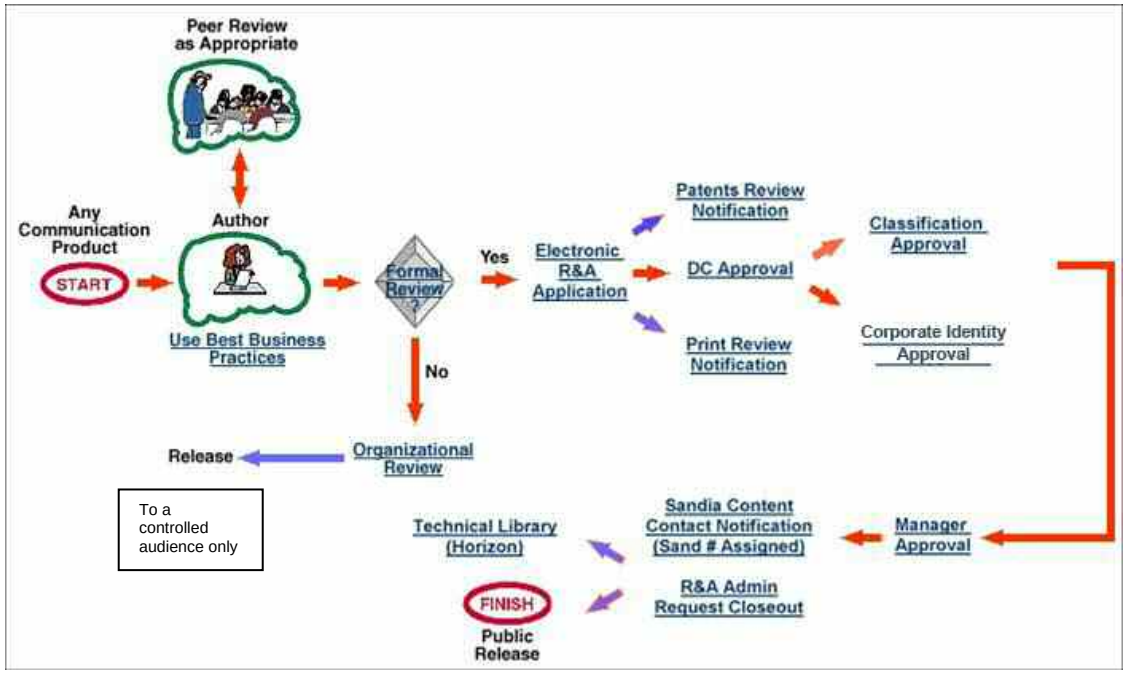


Figure 2-1. Flow Chart of Electronic R&A Process.

For unusual formats not easily uploaded into Web FileShare (videotapes, DVDs, CDs, requests with multiple files, etc.), the hardcopy routing option is available. The submitter should use the electronic application to provide the basic information about the request (contact, authors, format, etc.) and write the tracking number on the routing package.

CLASSIFIED information **MUST NOT** be uploaded into Web FileShare. The "hardcopy" routing option is used for classified requests. The submitter should fill in all the necessary information and then write the tracking number on the information release.

Warning: Do not put a classified report into the Electronic R&A System. If you are not sure about the classification level of the document, consult a Derivative Classifier or a Classification Analyst. Do not upload a classified document into Web File-Share.

1. The author ensures that peer reviews and corrections are incorporated into the document. To ensure that the communication product is handled properly before initiation of R&A, it should be reviewed as soon as possible by a Derivative Classifier (DC) if there are any classification concerns.

2. The author obtains all necessary DOE/agency pre-approvals.

3. The requester downloads a cover template from the Corporate Forms web site, completes the required info, and combines it with the approved document.

   http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand

NOTE
It is recommended that the requestor or the SNL content contact fill out the Pre-Flight Checklist prior to submitting the electronic R&A. The Checklist is accessed via the electronic application: https://cfwebprod.sandia.gov/cfdocs/RAA/templates/ under Prepare Request.

4. The author or requestor (the requestor may be someone else other than the author) uses the electronic application to initiate the R&A process:

   https://cfwebprod.sandia.gov/cfdocs/RAA/templates/

5. The requestor provides the complete names (i.e., full middle names preferred) of authors (including non-Sandians) and all co-authors.

6. The requestor uses the electronic application to submit the R&A request and to upload the native file (e.g., Word) to Web FileShare. The names of all authors (including non-Sandians) and co-authors (including complete middle names) should be included.

NOTE
Common Look and Feel reviews for public communications will be arranged by the type of communication product indicated in the electronic R&A application.

All communication products, including those that promote Sandia capabilities, must be reviewed for adherence to Common Look and Feel/Corporate Identity (Sec 3.1. Review of Communication Products) guidelines by the Sandia Creative Group (NM) or Public Relations & Strategic Communications (CA).

- ***IF*** the communication product is a SAND Report (typically, a document officially released by Sandia), a cover, a title page, table of contents, and a distribution list (including housekeeping copies) are required prior to final review by the R&A Administrator (NM or CA).

- ***IF*** there is disagreement about the assigned classification sensitivity, the classification analyst will work with the DC and the author to reach an agreed-upon classification.

- ***IF*** the communication product needs revision, the reviewers will note that in the Comments field, and the author is responsible for making the changes.

- If the requestor chooses not to replace the revised document in Web FileShare, he/she should ensure that the Print Shop receives the final document for printing.

7. After the requestor agrees to incorporate changes in the R&A application, the system generates a SAND# and notifies the requestor via email.

8. The requestor adds the SAND number to the cover and title page and replaces the file in Web FileShare.

9. The R&A Administrator indicates approval/closes out R&A. The electronic form is not closed until the Administrator block is *signed* and *dated*.

- ***IF*** the communication product is to be printed, the author contacts Printing Services (284-3475) to send unclassified unlimited release files to the Printing Services collaborative space folder
  - \\snl\collaborative\printshop (PC users)
  - smb://ds09snlnt/printshop (Mac users).
  - (A controlled-access UCI folder also exists in the collaborative space folder.)

- Refer to the Easy Printing PDF file at the Printing Services web site for forms and information \\snl collaborative\printshop (PC). The author should carefully review all file formats that are sent to Printing Services.

  Printing and Publishing Department Publishing Processes

10. If the document is printed through them, Printing Services provides the housekeeping copies to the libraries. If you do not use them, you must provide the housekeeping copies (see Section 4.1). The Technical Library holds the record copy of all formal SAND Reports.

2.4 Hardcopy Routing (Unclassified Unlimited and Limited Release)

NOTE

Do not use this procedure for classified material. For classified R&A, see Section 2.5, Classified Hardcopy Routing**.**

- ***IF*** the communication product is complex video, sophisticated PowerPoint presentations with embedded video or large amounts of graphics and pictures, prepared CDs and DVDs with multiple files, or any other format not supported by Sandia's Common Operating Environment, choose "hardcopy routing" from the R&A electronic application. (The electronic application is used for tracking certain information regarding hardcopy submission of communication products.) Use the routing details page to create a routing list and record the document/tracking number on the cover of the document.

- ***IF*** the communication product does not fit in a folder (e.g., videos, displays), the author includes any relevant documentation (Web site map, scripts, layouts, pictures of displays, etc.) in the folder and sends the item with the folder. If that is not practical, contact the Classification and Export Control Department to determine how the item can be reviewed.

2.5 Classified Hardcopy Routing

Classified material can currently be submitted for R&A using the hardcopy routing procedure below. When files have been appropriately classified for a particular network, documents may be transferred using a classified network. Always notify your reviewers before sending electronic files.

- The requestor ensures that peer reviews are completed and corrections are incorporated into document. The requester downloads a cover template from the Corporate Forms web site, completes the required info, and combines it with the approved document or includes in a separate file.

  http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand

  The Derivative Classifier should have provided an initial classification.

- The requestor marks the material with appropriate classification and access restrictions. To ensure proper physical protection, appropriate markings and legends should be placed on the draft copy as soon as possible.

- The requestor obtains all necessary DOE/agency pre-approvals.

- The requestor obtains all necessary contractual or outside agency approvals.

- It is recommended that the requestor fill out the Pre-Flight Checklist available via the electronic R&A application prior to initiating the electronic R&A. (The electronic application is used for tracking certain information regarding hardcopy submission of communication products.)

- The requestor uses the electronic R&A application to initiate R&A. The requestor selects “hardcopy” for hardcopy routing. If the title is classified, enter “classified title” in the title field. The requestor provides the complete names of authors (including non-Sandians) and all co-authors, with their complete middle names.

- Requestor should consult the department’s Classified Administrative Specialist on appropriate markings, logging out, and handling and wrapping of classified hardcopies and/or Accountable Removable Electronic Media (ACREM).

NOTE

Use properly marked front and back cover sheets on each hard-copy of the draft document and on the master. For Secret, use Form SF 704 for the front cover and Form SF 2900-HE or -EA for the back cover; for Confidential, use Form SF 705 for the front cover and Form SA 2900-HEA for the back cover.

- Put the material, with the appropriate cover sheets, in a classified folder or envelope. Staple the folder together at the top and right side to secure the contents or use strong rubber bands around the folder in both directions. Place bulky documents in an envelope.

NOTE

The requestor must hand carry the classified document package to each of the reviewers obtained through the R&A electronic application. It is also permissible to send the copies via classified email to recipients with access to classified networks. Be sure that the materials are appropriately classified for the classified network to be used and coordinate the transfer with the recipient.

- Attach the routing slip from the electronic application and hand carry to therecipients. The reviewers approve via the electronic R&A.

- ***IF*** there is disagreement about the assigned classification, the classification analyst will work with the DC and the author to arrive at an appropriate classification.

- ***IF*** the communication product is a promotional communication (those that promote Sandia capabilities), it must be reviewed for adherence to Common Look and Feel guidelines by the Sandia Creative Group (NM) or Public Relations & Strategic Communications (CA).

- The requestor accesses the reviewer comments through the electronic R&A or on the hardcopy. The author makes any necessary revisions, including adding the SAND number to the title page.

- The R&A Administrator (NM) closes out the R&A processes. The R&A is not closed out until the R&A Administrator block is signed and dated. After close-out, contact Printing Services (NM) to make printing arrangements. The requestor supplies the native files and a PDF to Printing Services.

- If the document is printed through them, Printing Services provides the housekeeping copies the libraries. The Technical Library holds the record copy of all formal SAND reports. *Refer to Section 4 for information on how to prepare the communication product for printing and how to submit it to Printing Services. Section 4.1 explains how to submit electronic files to the Technical Library.*

NOTE

The Prime Contract requires that inventions be reported and gives the government and Lockheed Martin certain rights. It is the author's responsibility to notify Legal Intellectual Property Center (11500) when intellectual property might be involved.

2.6 Reuse of Previously Approved Materials

Sometimes the content of an approved communication product is reused in another form, such as when a conference paper is published as a journal article or SAND Report. In some instances, the communication product might be directed to a different audience than that for which it was originally approved or in a different format (e.g., journal article is converted to conference paper). In these instances, the document is required to go through R&A, and a new SAND number will be assigned.

IF no substantial technical changes (e.g., grammatical, spelling, and minor wording changes that do not affect technical content) were made and the new audience is consistent with original sensitivity and distribution limitations, the communication product does not have to go through Formal R&A, and a new SAND number is not assigned. Instead, the author prepares an email for the R&A Administrator that states the SAND number of the original document and explains the new circumstances. The R&A Administrator will document the information in the comments field in the electronic R&A, which is forwarded to the Technical Library.

Reissue of SAND Reports

IF a SAND numbered communication product is to be issued in a different form as a SAND Report, the author submits the material to a Formal R&A. A new SAND number is issued.

IF a SAND Report is to be reissued as a SAND Report because of updates or revisions and contains substantial technical changes or is directed to a different audience not consistent with original sensitivity and distribution limitations, it goes through Formal R&A. A new SAND number is issued, and a statement is added on the cover and title page stating that the new communications product supersedes the old (Figure 2-2).

Cover:	Title Page:
SANDIA REPORT SAND2001-0127 Unlimited Release Printed July 2001 Supersedes SAND95-1234 dated April 1995	SAND2001-0127 Unlimited Release Printed July 2001 Supersedes SAND95-1234 dated April 1995

Figure 2-2. Supersession Statement on Cover and Title Page.

When an abstract is developed into any type of communication product, Formal R&A is required, and a new SAND number is assigned.

Reprints

Reprints may retain the original SAND number with the addition of the new print date as shown in Figure 2-3 to the top block on the cover and title page. The Distribution may be updated consistent with the original R&A approval.

When the scope of the distribution or audience for a document is different than that originally approved but no substantial technical changes were made, the document is published as a reprint. On the title page, one line below the “Reprinted” date, note the following:

> The only change to this document is the distribution limitation, which has changed from _____ to _____.

If the access restrictions are changed for the document, then the Technical Library will need a corrected electronic copy for unclassified documents. Coordinate changes with the Classification and Export Control Department (NM) or Security Operations (CA).

Informal reprints are reproduced on office copiers (Printing Services is recommended for jobs consisting of more than 5000 sheets of paper) without updating the cover, title page, and distribution page. If there are no substantial changes to the content or sensitivity and distribution limitation, no R&A is required. A formal reprint is recommended when more than 10 copies are required.

When a *working* copy is to be sent outside Sandia, the original cover, title page, and distribution are used. Printing Services should be used so that the cover is on Sandia's preprinted cover stock.

A ***formal reprint*** may be done if there were no changes to technical content or to the sensitivity and distribution limitation. The cover, title page, and distribution page of the document are updated. Minor corrections of typographical errors or simple word changes may be made. A notice that this is a second or subsequent printing and that the reprint date replaces the original print date on the cover appears on the title page under the last print date (Figure 2-3). The new distribution list is added to the old. Reprints retain the original SAND number.

NOTE:
Notify Classification and Export Control Department or Security Operations regarding the need for R&A whenever a Patent Caution is removed.

Cover:	Title Page:
SANDIA REPORT SAND2000-1056 Unlimited Release Reprinted January 2001	SAND2000-1056 Unlimited Release Printed October 2000 Second Printing, January 2001
Distribution: (Follows original distribution list) Second Printing, January 2001 30 MS 0159 John Wallace, 9313	

Figure 2-3. Cover, Title Page, and Distribution Changes to Reprints.

3. CORPORATE IDENTITY

3.1 Review of Communication Products
3.2 Sandia Corporate Signature, DOE Seal, NNSA Logo, Lockheed Martin Logo
3.3 Corporate Image – Text
3.4 Corporate Image – Design Elements
3.5 Presentation and Web Templates

This effort, managed by the Public Relations & Communications Center, is to convey a consistent professional image and unified corporate look on all Sandia's communications intended for public releases. Communications products are created to attract business, promote capabilities, convey general corporate information, or generate good will.

Communication products include SAND Reports, which convey scientific and technical information, external project-level and program-level presentations and reports, Web-based collaborations of scientific and technical works, fact sheets, fliers, brochures, displays/exhibits, video, and presentations. They are also subject to formal Review and Approval.

3.1 Review of Promotional Communication Products

Before committing funds for product design, confer with one of the following to develop a design that is consistent with Corporate Identity guidelines (they also later approve design concepts in the Formal R&A process):

Linda Lovato-Montoya (NM), MS0619, 505-844-0268
Devon Powers (CA), MS9131, 925-294-1470

Approval of Corporate Identity elements is required for all communications and are provided for through the electronic R&A application. Contact Printing Services (NM) or the Communication Arts Department (CA) with questions about these reviews.

3.2 Sandia Corporate Signature, DOE Seal, NNSA Logo, Lockheed Martin Logo

Sandia's signature (the thunderbird insignia and the Sandia National Laboratories logotype) is a trademark symbol used to establish and enhance name recognition among customers and the public. Using the Sandia signature consistently, properly, and prominently on all communication media is extremely important.

NOTE

Logos and signatures are available electronically at the following location:

Creative Arts Resources

Guidelines

The Sandia signature consists of two elements: the thunderbird insignia and the Sandia National Laboratories logotype. The logotype consists of a unique typeface and is not to be replaced by other typefaces. (Official Sandia blue is custom ink match Pantone 312; and #00CCFF for HTML.)

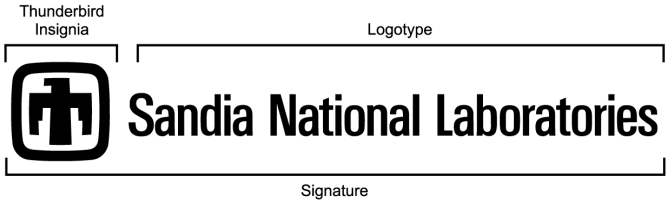
A document header or footer may not include the Sandia logo, departmental logos, or the words "Sandia National Laboratories" on internal pages of a report as part of the document design. Using the Sandia logo on internal pages violates Laboratory Communications policy.

Employees shall not authorize third party use of the Sandia logo, thunderbird logo, or any Sandia or DOE trademark without prior Legal Division review.

Sandia has agreed to use the DOE insignia (seal) on all printed products released to the public. The DOE seal is normally used in conjunction with the standard DOE acknowledgment statement and the Sandia signature. The NNSA Logo is shown below. (See 1.9 NNSA.)

The Sandia corporate signature must appear on the front or back covers of any Sandia documents released to external audiences (including SAND Reports). It must also appear on all presentation materials. Sandia's corporate signature must always be reproduced from approved digital files.

The corporate signature has only two configurations: horizontal or stacked. The position and size of the thunderbird insignia in relation to the logo are fixed and must not be altered.



The white space left around the corporate signature must be ½ the height of the thunderbird insignia.

Posters released externally should incorporate Common Look and Feel elements, the DOE-Sandia funding statement (Section 1.6), and Sandia and DOE logos.

3.3 Corporate Image – Text

The following quotes and slogan may be used to reflect Sandia's image as a primary provider of engineering and science to ensure national security:

"…exceptional service in the national interest." (quote from Truman letter)

"Helping our Nation Secure a Peaceful and Free World Through Technology."

3.4 Corporate Image – Design Elements

The graphic elements presented here may be used to reinforce Sandia's image visually. They can be used individually or in combination to provide a unifying look to communications:

Sandia corporate signature

Sandia National Laboratories

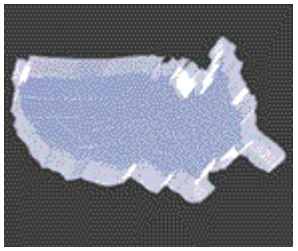
Red, white, and blue color theme (with gold as an accent color) (Refer to Web site for precise color values)

American flag – Stylized treatment or photos are acceptable

"…exceptional service in the national interest."

Use text and punctuation as shown here. Font, style, and color may vary.

United States geographic outline—can be combined with flag, sky background, or backdrop.



NOTE

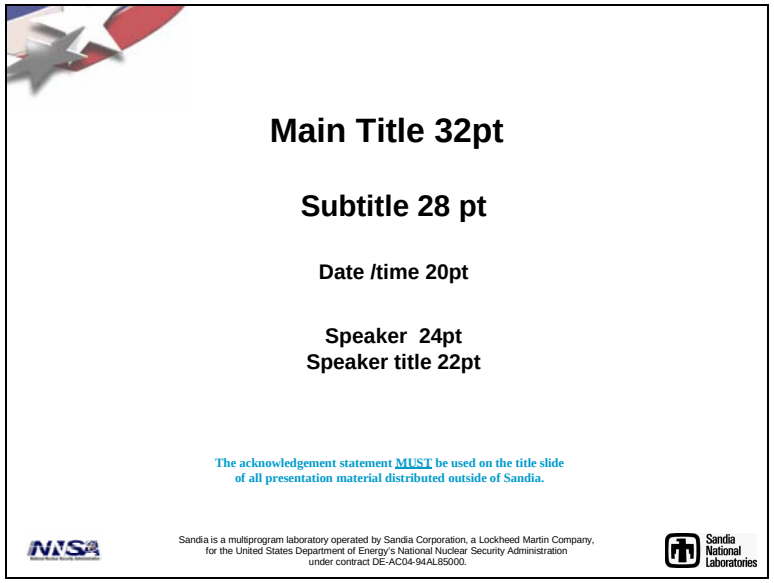
The Sandia Creative Group Web site has examples of the design elements and their requirements: Creative Arts Resources

3.5 Presentation and Web Templates

Templates for presentations that incorporate Corporate Identity elements are available at the following location:

Creative Arts Resources

Presentation Template from Creative Arts web site with American flag motif, logos, and funding statement (Section 1.6).



4. PREPARATION, PRINTING, AND DISTRIBUTION

4.1 Submitting SAND Documents for Record Copy and Electronic Access
4.2 Printing and Distribution
4.3 Submitting Work for Printing and Distribution

4.1 Submitting SAND Documents for Record Copy and Electronic Access

The Technical Library is responsible for the record copy of all SAND documents. After a SAND document has been signed off through the electronic R&A application, the author needs to send an electronic copy of the report to Printing Services if hard copies are to be printed. Printing Services automatically submits an electronic copy to the Technical Library as well as the other housekeeping copies as specified in the distribution. If hard copies are not printed, the author must send the file to the Technical Library. Electronic access to SAND documents is made available through various services, depending on classification and limitations, including the Technical Library's online catalog, Sandia's search capability, and Web FileShare.

Abstracts remain on line after publication of the complete document, so updated abstracts should be sent to the Technical Library. Conference papers should also be updated if changed. Substantially changed abstracts and conference papers are subject to additional R&A. A conference paper should also include the title and date of the conference publication as well as the page numbers of the conference paper within the proceedings, if available.

NOTE:
Notify Classification and Export Control Department (NM) or Security Operations (CA) regarding the need for R&A whenever a Patent Caution is removed. Be sure to notify the Technical Library when the Patent Caution is removed so that they can make the material available.

The Technical Library prefers to receive files as PDFs. It will also accept PC-compatible electronic files in Adobe Acrobat PDF, MS Word WordPerfect, PowerPoint, Rich-Text Format, or other formats supported by the common operating environment for Sandia computers. Files for unclassified unlimited release material may be submitted to: Technical Library Reports Receivable at MS0899 on floppy, Jaz, CD-ROM, or Zip disks. These files may also be sent electronically as follows:

1. Placed in the Public Drop Zone folder under: SANDDOCS
2. By email to: SANDDOCS@SANDIA.GOV
3. Send the Web FileShare URL to: SANDDOCS@SANDIA.GOV

Be sure to reference the SAND number and file type on all submittals.

- ***IF*** some graphics are still in hardcopy, send those pages along with the electronic file. Printing Services will scan the graphics and add them to the file.

NOTE

Refer to the Easy Printing PDF file, at \\snl\collaborative\printshop for forms and information on creating the PDFs for printing. The author should carefully check all PDFs sent to Printing Services. Printing Services site at \\snl\collaborative\printshop\UCI-OUO contains a folder in which UCI can be placed. (Access this site from Run on a PC.) Once you place UCI in that file, you cannot access it again. **Call for instructions on how to send classified material electronically to Printing Services.**

❑

- ❑ ***IF*** only a hardcopy exists, send a copy (preferably unbound) to the Technical Library (Reports Receival, MS0899), and it will be scanned.

NOTE

Authors send electronic files to Printing Services. Printing Services provides electronic files (PDFs and native files) of formal SAND Reports and those with A, C, J, and P suffixes to the Technical Library at the end of R&A. The electronic files of SAND Reports sent by Printing Services to the Technical Library are indicated on the distribution list housekeeping copies (Figure 5-10). If your document does not go through Printing Services, then you need to ensure that the libraries receive the housekeeping copies.

4.2 Printing and Distribution

Printing from Electronic Files

A SAND Report can be printed from paper masters or electronic files transmitted directly to Printing Services through the electronic R&A application. Printing Services prefers to receive native files as PDFs created to their specifications (see Easy Printing at \\snl\collaborative\printshop.

Files can originate on PC, Macintosh, or UNIX systems, but they must be PostScript (files with PDF extensions are acceptable for UNIX). PostScript files are not manipulated at the print shop and are printed as you have them set up. Native files from software packages such as Acrobat, CorelDRAW, Microsoft Office, FoxPro, Illustrator, InDesign, Photoshop, PageMaker, QuarkXpress, VersaTerm Pro, and Access may be manipulated for best results. QuarkXpress is the preferred publishing software, especially for color (PowerPoint, Illustrator, and Photoshop also work well).

Table 4-1 lists the acceptable media for delivery of files to Printing Services.

Table 4-1. Acceptable File Media

UNCLASSIFIED FILES	
PC	SRN transfer, floppy, Zip, Jaz, CD
Macintosh®	SRN transfer, floppy, Zip, Jaz, CD
UNIX®	SRN transfer
CLASSIFIED FILES	
PC or Macintosh®	Properly marked Jaz disks or CDs

Distribution

See Section 5.13. Distribution, for details on distribution. Printing Services can help you arrange distribution of copies listed in the Distribution List. Printing Services will not print more copies than are included on the Distribution List.

4.3 Submitting Work for Printing and Distribution

1. Incorporate any changes from electronic R&A Approvers' comments. Refer to the checklist (Appendix B) to be sure that the document has been properly prepared.

2. Your printed report must have a properly marked cover. You are responsible for making a cover from the templates on the Corporate Forms Web site.

   http://www-irn.sandia.gov/corpdata/corpforms/sandreportforms.htm

   You may also order a report cover from the Sandia Creative Group (NM) using Service Order Form SA 1820-A (Figure 4-1) or the Communication Arts Department (CA) online service order

   http://www.ran.sandia.gov/CaLabCom/LabComCA.html).

   The cover must be included with the master or electronic files sent to Printing Services, or it may be in a separate file.

> **NOTE**
> Inserting covers in the electronic file after the document is completed can be difficult. See Appendix A for cover links. The SAND Report samples on the Sandia Creative Group web site include covers
> Creative Arts Resources

3. Check the master or the electronic files to be sure that page numbering is sequential. For back-to-back printing, right-hand pages have odd numbers and left-hand pages have even numbers. Refer to Appendix B: Checklists.

4. The report cover is proofed by the author.

5. Mail or hand-carry the electronic files or report masters and Service Order Form SA 1820-A to the Printing/Publishing Department. If the report material is mailed, retain a copy of the service order.

The Printing Services web site offers guidance on how to submit documents for printing at

Printing and Publishing Department Publishing Processes

6. Attach a copy of the Service Order Form SA1820-A used to order printing services.

7. Make self-adhesive labels for all internal and external addressees receiving classified reports and for all internal addressees receiving Confidential or Secret reports. The, Printing Services Document Processing Team supplies labels for external addressees who are to receive Confidential and Secret reports. If the report is Secret, also prepare Receipts for Classified Information (RCIs) in accordance with Classified Matter Protection and Control guidance. For unclassified reports, the customer must supply mailing labels for external addressees. Printing Services can print address information on the back cover of SAND Reports for internal distribution.

8. Send the forms and labels to Document Processing. You can arrange beforehand for Printing Services to put the mailing address from your Distribution List onto the back of unlimited release copies.

- ***IF*** the service order indicates in the "Deliver To" section that the printed copies are to be mailed, Document Processing intercepts the reports and processes them for distribution.

SA 1820-A (5-2006)

LABORATORY COMMUNICATIONS
Service Order

Service Order Project No. 13265

☐ Video Services — Bldg. 892, Rm. 101, MS 0650, Phone 844-7167
☒ Printing & Publishing — Bldg. 894, Rm. 124, MS 0617, Phone 284-3475
☒ Creative Arts — Bldg. 894, Rm. 201, MS 0619, Phone 844-6416

Required Fields

Requester	Name (Required)	Org.	Mail Stop
	Derek Waters	3654	0619
	Phone: 844-1085	Today's Date: 6/14/06	Required Completion Date: 7/10/06

Project Number Information

Project	Task	Charging Org.	Est. $ Amount
7556	01.03	3654	$600.00

Project Description: Water Resources in Sudan
SAND Report editing and printing

SAND No. 2006-0001
No. of Pages 76

CLASSIFICATION
☒ Unclassified
☐ OUO
☐ Classified

☐ Send To: ☐ Deliver To: Bldg./Room ☐ Call for pickup ☒ Send to Mail Services

Name (if different from requester)	Phone	Mail Stop	Bldg./Room

Item No.	No. of Pages	Qty.	Description of Work or Service
1			Creative Arts – provide editing/writing and graphics support on SAND report document. Create SAND report cover and add to document.
2	76	25	Printing & Publishing – print copies of document from electronic file provided. • 25 copies • 76 text pages – 66 black and white pages ; 10 color pages • 2-sided • Spiral binding • Imprint mail stops/names on internal copies; labels provided for external distribution

Complete for Classified Work Except for Accountable REM

Description of Material:

Security Classification	Classified by	Classifier's Job Title	Date of Classification	Org.	Mail Stop

RECEIPT FOR CLASSIFIED: I assume responsibility for receipt of this classified material and will handle, store, and transmit in accordance to existing regulations.

Name	Org.	Mail Stop	Signature	Date

Service Center Personnel Use Only

Service Center Personnel Estimate

Hours/Units	Item No.	Name	Totals

Project Manager — Phone No.

Figure 4-1. Service Order Form for Report Cover and Print Shop Services. http://www-irn.sandia.gov/corpdata/corpforms/1820a.dot

5. SAND Report Preferred Specifications and Structure

5.1 Preferred Specifications
5.2 SAND Report Structure
5.3 Covers
5.4 Title Page
5.5 Acknowledgements
5.6 Contents
5.7 Preface or Foreword
5.8 Executive Summary
5.9 Acronyms and Abbreviations
5.10 Body of the Report
5.11 References and Bibliography
5.12 Back Matter
5.13 Distribution

5.1 Preferred Specifications

A SAND Report must have an appropriately marked cover, title page, and distribution list. Internal pages must be marked for their classification. Appendix B: Checklists, lists items that should be checked before the report is submitted for R&A.

The following print styles and sizes were selected for ease of reading. The use of very small type is discouraged. Capitalized headings are harder to read. SAND Reports take a variety of forms, and the preferred specifications are guidelines that work for most documents. Authors may use other formats but are cautioned to be aware of the usability and readability of their text and figures.

Figure 5-1 shows a selection of headings and captions appropriate for a SAND Report. Chapter titles and headings may be numbered. Other good guides are the SAND Report samples on the Sandia Creative Group web site: Creative Arts Resources.

Document Title (24-point Arial or Helvetica Bold, 22 point if title is long)

Subtitle 18 point Arial or Helvetica Bold

Chapter Title (20-point Arial or Helvetica Bold)

Level 1 Sidehead (18-point Arial or Helvetica Bold)

Level 2 Sidehead (14-point Arial or Helvetica Bold)

Level 3 Sidehead (12-point Arial or Helvetica Bold Italic)

Level 4 Sidehead (11- point Arial or Helvetica Bold)

Level 5 run-in heading (11 point Arial or Helvetica Bold). Run-in headings appear on the same line of the text that it introduces.

Level 6 run in (11-point Times New Roman or Century Schoolbook, Italic).

Figure 1.1. 11- Point Arial or Helvetica Bold. End with a period, put caption under figure.

Table 1.1. 11-Point Arial or Helvetica Bold. Place above the table.

Figure 5-1. Sample of SAND Report Headings, Figure Captions, and Table Titles.

Title and Headings

At the author's discretion, sections may be numbered, or the heading style may be varied, depending upon the particular needs of the document. It is desirable to avoid many headings and short sections that interrupt the flow of the text. In longer documents, dropping the major section titles ("drop head") down two or three line spaces from the top of the text area aids the reader in finding sections.

Headers and Footers

Headers and footer are optional, but they should be appropriate to the document and useful to the reader. Headers and footers may not include the Sandia logo, departmental logos, or the words "Sandia National Laboratories."

Body Text

Type Size and Font

11- or 12-point Times New Roman or other serif type is appropriate for body type in most reports. The readability of type varies by font, so pick a point size that works for the font you use.

Line Length

Double Column – 3 ¼ inches for each column, gutter 1/4 to 1/3 inch between columns.

Single Column – 6 inches or 6 ½ inches. Use with 10 to 12 point type.

Line Spacing

Single line spacing is preferred except for reports with equations (1.5 or double line spacing may be used).

Hyphens and En Dashes

Hyphens (-) are used for breaking words. The en dash (–) can be used as a minus sign or can be used in inclusive numbers (e.g., 18–21). The em dash (—) is used as punctuation to break a sentence abruptly.

Paragraph Style

Paragraph Indents, Spacing, and Numbering

Block or initially indented paragraphs are acceptable. Leave one or two blank lines between paragraphs.

Paragraph numbering is optional.

Ragged Right Margin or Justified Right Margin

Either is acceptable. Text with a ragged right margin has been shown to be faster to read. Right-justified text may have uneven spacing that needs to be corrected.

Page Layout

Paging

SAND Reports are usually printed on both sides (back to back) of the page. Headers, footers, page numbers, and margins need to alternate appropriately, depending on how you have set up the document. Centered page numbers are preferred. Make a two-sided copy of your document to be sure that paging is correct. New sections, chapters, and appendices usually begin on an odd-numbered (right-hand) page in longer documents. This may be varied in short documents (15 pages) or in documents with many short sections. See Page Numbers below.

Page Margins

One inch, on top, bottom, and sides. The left margin may be set at 1.25 inches. If different margins are used, the widest is the binding-side margin. Even right and left margins are preferred.

Page Numbers

One-half inch from bottom of page and ½ inch below last text line, centered or flush with outside margin (centered page numbers are preferred). Begin counting with the cover (see 5.2) so that the title page is page 3. Use only Arabic numbers on SAND Reports.

For a classified report, the page number 1 shows on the cover, but it does not appear on the cover of an unclassified document.

Classified reports require a back cover (front and back of page); the front cover is numbered for classified.

Classified reports that end on a right-hand (odd-numbered) page have a following blank page. Blank pages have a page number, proper marking, and this Page Intentionally Left Blank centered on them.

All classified documents are required to have page numbers sequentially numbered. Unclassified documents may be numbered sequentially or by chapter or section.

Figures and Tables

Orientation of Figures and Tables

Graphics may be presented in portrait (vertical) or landscape (horizontal) orientation, which requires the page to be turned 90 degrees counter-clockwise (to the left) to be read. Use of landscape figures is discouraged unless they are required for legibility. The caption must also be landscaped, but the page number orientation and position remains the same as for portrait pages.

Placement of Figures and Tables

Figures and tables should appear as soon as possible after they are called out in text and always within the same major section or chapter in longer documents. Lengthy tables or a long series of illustrations may be placed in an appendix if they interrupt the flow of the text.

Captions for Figures and Tables

Figure captions should be short and end with a period. Place the caption 1 to 1 ½ lines **under** the illustration. Enter the figure caption in a font different from that of the text (e.g., 11-point Arial bold). Descriptive text after the period should be in the same font but not bolded. Block the caption under the figure unless it is very narrow, but do not run it across the page.

Table titles are placed 1 to 1 ½ lines **above** the column headings. They should be in the same font used for captions, ending in a period. Descriptive text after the period should be in the same font but not bolded.

Callouts

The preferred minimum type size for callouts is 10 points, although 9-point bold may be legible.

Source Lines on Figures

If a graphic is taken from another work, that information must be included with the graphic. If the graphic is taken from a non-Sandia source, obtain written permission from the previous publisher. Cite the source in the caption, or above the caption such that the source information will travel with the graphic if used elsewhere. Changing the graphic slightly does not relieve the author of the obligation to use a source line. Examples:

"Reprinted with permission from…" if unchanged.
"Adapted with permission from…" if slightly modified.
"Redrawn with permission after…" if redrawn in substantially the same manner.

Oversize Figures

Oversize figures may require special handling in printing or copying. Be sure that Printing Services is aware of your needs and can accommodate them.

Markings and Legends

Refer to Appendix A.

Sandia Address Format

Use the following address formats:

Sandia National Laboratories
Name (initials and last name or full name)
Mail Stop (MS ####)
P.O. Box 5800
Albuquerque, NM 87185-#### (mail stop number)

Sandia National Laboratories
Name (initials and last name or full name)
Mail Stop (MS ####)
P.O. Box 969
Livermore, CA 94550-0969

Sandia National Laboratories
Name (initials and last name or full name)
Mail Stop (MS ####)
P. O. Box 871
Tonopah, NV 89049-0871

5.2 SAND Report Structure

SAND Reports follow a standard sequence, although deviations may be made when necessary. Not all the elements appear in every document.

- Front Cover (page 1, number is not shown on unclassified report)
- Disclaimer Page (inside front cover, page 2)
- Title Page (page 3); this number appears on all reports.
- Acknowledgments (optional, page 4; this page may be left blank, but is numbered)
- Contents (page 5, or odd-numbered page)
- Preface or Foreword (optional, next blank page after Contents)
- Executive Summary (optional, odd-numbered page)
- Acronyms or Abbreviations
- Body of the Report
- References and Bibliography
- Back Matter
- Glossary
- Appendices
- Index
- Distribution (odd or even page)

5.3 Covers (Front and Back)

The cover includes the following elements:

SAND Number
Distribution Limitation
Print Date
Title
Authors
Markings and Legends

SAND Report Covers

The author is responsible for providing a front and/or back cover with the document. UCI and classified reports require a back cover (which is not page numbered). Printing Services will provide a blank back for Unlimited Release documents. The text for SAND Report covers may be prepared by the Sandia Creative Group upon request, or the author may use the cover templates available on the Corporate Forms Web site. Covers are printed on preprinted Sandia stock, and the text is laid out as shown in Figure 5-2. Covers may be inserted in the document files or placed in a separate file.

http://www-irn.sandia.gov/corpdata/corpforms/sandreportforms.htm

Markings and legends required for the cover are given in Appendix A.

The inside front cover carries the legal notice (disclaimer) and is numbered page 2 (Figure 5-3).

Internal Memorandum Covers

Covers for internal memoranda are shown in Figure 5-4. The unclassified cover is available at:

http://www-irn.sandia.gov/corpdata/corpforms/sandreportforms.htm

SANDIA REPORT

SAND2005-xxxx
Unlimited Release
Printed Month/Year (e.g., July 2005)

Title

Author(s)

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

Sandia is a multiprogram laboratory operated by Sandia Corporation,
a Lockheed Martin Company, for the United States Department of Energy's
National Nuclear Security Administration under Contract DE-AC04-94AL85000.

Approved for public release; further dissemination unlimited.

Sandia National Laboratories

Figure 5-2. Layout of SAND Report Cover.

http://www-irn.sandia.gov/corpdata/corpforms/sandreportforms.htm

Issued by Sandia National Laboratories, operated for the United States Department of Energy by Sandia Corporation.

NOTICE: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, make any warranty, express or implied, or assume any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represent that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, any agency thereof, or any of their contractors or subcontractors. The views and opinions expressed herein do not necessarily state or reflect those of the United States Government, any agency thereof, or any of their contractors.

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Available to DOE and DOE contractors from
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

Telephone: (865)576-8401
Facsimile: (865)576-5728
E-Mail: reports@adonis.osti.gov
Online ordering: http://www.osti.gov/bridge

Available to the public from
U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Rd
Springfield, VA 22161

Telephone: (800)553-6847
Facsimile: (703)605-6900
E-Mail: orders@ntis.fedworld.gov
Online order: http://www.ntis.gov/help/ordermethods.asp?loc=7-4-0#online

Figure 5-3. Inside Front Cover.

Internal Distribution Only
(Use Patent Caution, if applicable)

Concepts for… *(title)*

John J. Doe and Mary H. Smith *(authors)*

Printed Month and Year

internal memorandum • **not to be distributed outside Sandia National Laboratories**

This cover format is to be used for informal working papers as distinguished from official Sandia National Laboratories reports. Classification review is required. Send one copy to the Technical Library, MS0899.

Formal scientific and technical reports must be produced in the official Sandia National Laboratories report format and require full review and Manager or Director approval.

Add applicable markings (Patent Caution, Official Use Only, etc.) to this cover page.

SECRET (unclassified sample)

Internal Distribution Only This document contains ___ pages.

Concepts for… *(title)*

John J. Doe and Mary H. Smith *(authors)*

Printed Month and Year

internal memorandum • **not to be distributed outside Sandia National Laboratories**

This format is to be used for informal working papers as distinguished from official Sandia National Laboratories reports. Classification review is required. Send one copy to the Technical Library, MS0899.

Formal scientific and technical reports must be produced in the official Sandia National Laboratories report format and require full review and Manager or Director approval.

RESTRICTED DATA
This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Unauthorized disclosure subject to Administrative and Criminal Sanctions.

Classified by: <Derivative classifier's name>

Title/Org: <Derivative classifier's title and organization>

Date: (optional) <Date classification was determined>

Derived from: <Designation of guide or source document and its date>

Dissemination and Reproduction Limitations – No further reproduction and/or dissemination of this document is permitted without the consent of the originator.

Sandia National Laboratories

SECRET (unclassified sample)

Internal Memoranda:

Unclassified and classified internal memoranda do not require a title page. SAND numbers are no longer used to list and track internal memoranda. No copies of the internal memorandum may be sent outside SNL, nor may the memorandum be cited as a reference in externally distributed papers and reports. The line organization is required to send the electronic file to the Technical Library. Internal memorandums cannot be unlimited release.

Corporate Forms: All Forms

Figure 5-4. Internal Memorandum Covers (Unclassified and Classified).

5.4 Title Page

Markings and legends for the title page are given in Appendix A. The Abstract is often indented and justified.

Unclassified Title Page (Figure 5-5)

An unclassified title page includes the following:

SAND Report Number
Sensitivity and Distribution Limitation (Unlimited Release, OUO/Export Controlled Information, etc.)
Print Date
Supersession Statement (if the report is a revision)
Title of Report
Authors,* org. name, and Sandia address
Contract or purchase order number if work was done with non-DOE funds or if report is authored by a non-Sandian on contract.*
Abstract (unless report is being done for an agency with different requirements, e.g., NRC)
Any required notices and markings that limit distribution (such as the Non-Sandia Proprietary Information notice)

Classified Title Page (Figure 5-6)

A classified title page includes the same elements as does an unclassified title page except for the following differences:

Any special limitation such as NWD and Sigma Number
Title followed by its classification in parentheses (e.g., U or SRD)
The word Abstract with its classification in parentheses
Any required notices (such as the Restricted Data notice)

* Figure 5-7 shows how to handle multiple authors on the title page. Figure 5-8 is a title page for a Contractor report.

5.5 Acknowledgments

Acknowledgments credit substantial contributors to the work who are not authors. Contributions that are part of a person's normal job responsibilities need not be acknowledged. The acknowledgments statement usually appears on the back of the title page and is numbered page 4.

5.6 Contents

The Contents begins on an odd-numbered page, usually page 5. It should list chapters and sections by number and title, including headings in the body text through the third order (include heading numbers, if any). Back matter should be listed by number (if any) and title. It is not necessary to list the headings within the appendices (Figure 5-9). Do not list the Distribution List. A Contents section is usually needed if the report has 15 pages or more.

If the document has more than two figures or tables, the figures and tables are listed separately by number and title. For expanded captions, give the text through the first period. Material in parentheses should be omitted unless needed to identify the figure or table.

5.7 Preface or Foreword

The Preface or Foreword is optional. It commonly begins on the next blank page after the Contents, or it may precede the Contents. It can be placed on the back of the title page if it is less than a page. The Preface includes information that is of interest to the audience but is not essential to a clear understanding of the text. A Foreword (never Forward) is written by a person other than the author after the document is finished and carries that person's name at the end. It consists of comments about the value, background, author's expertise, or other information that might add value to the report.

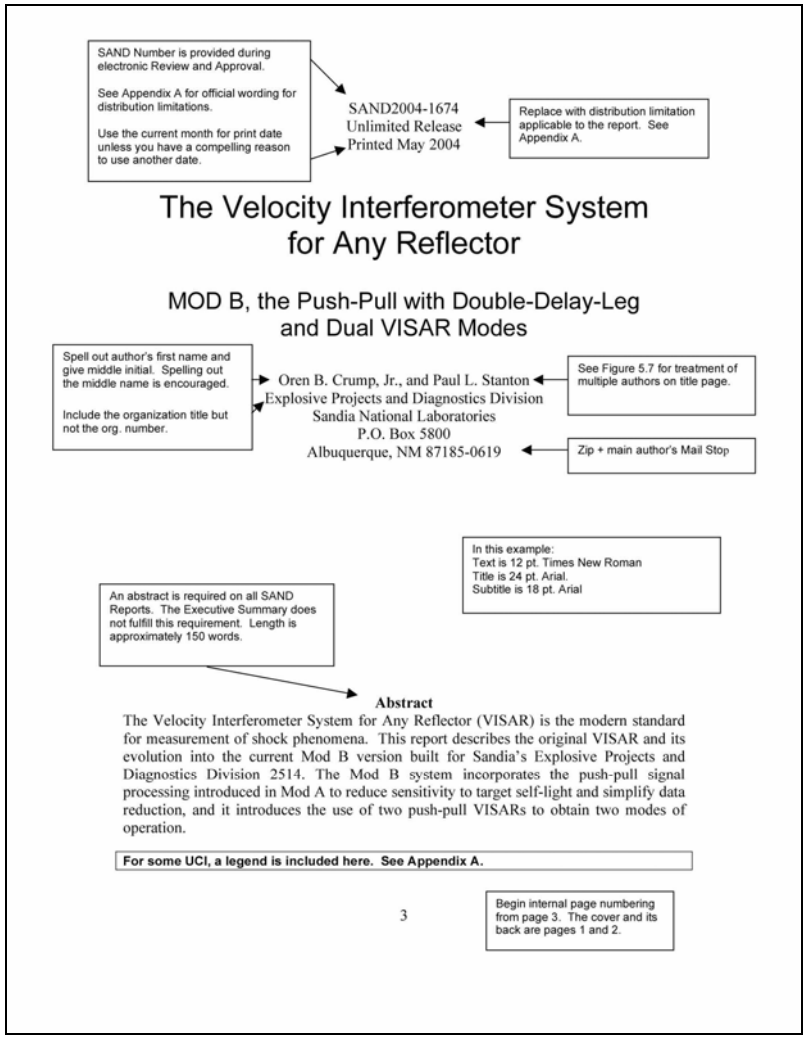


Figure 5-5. Unclassified Title Page.

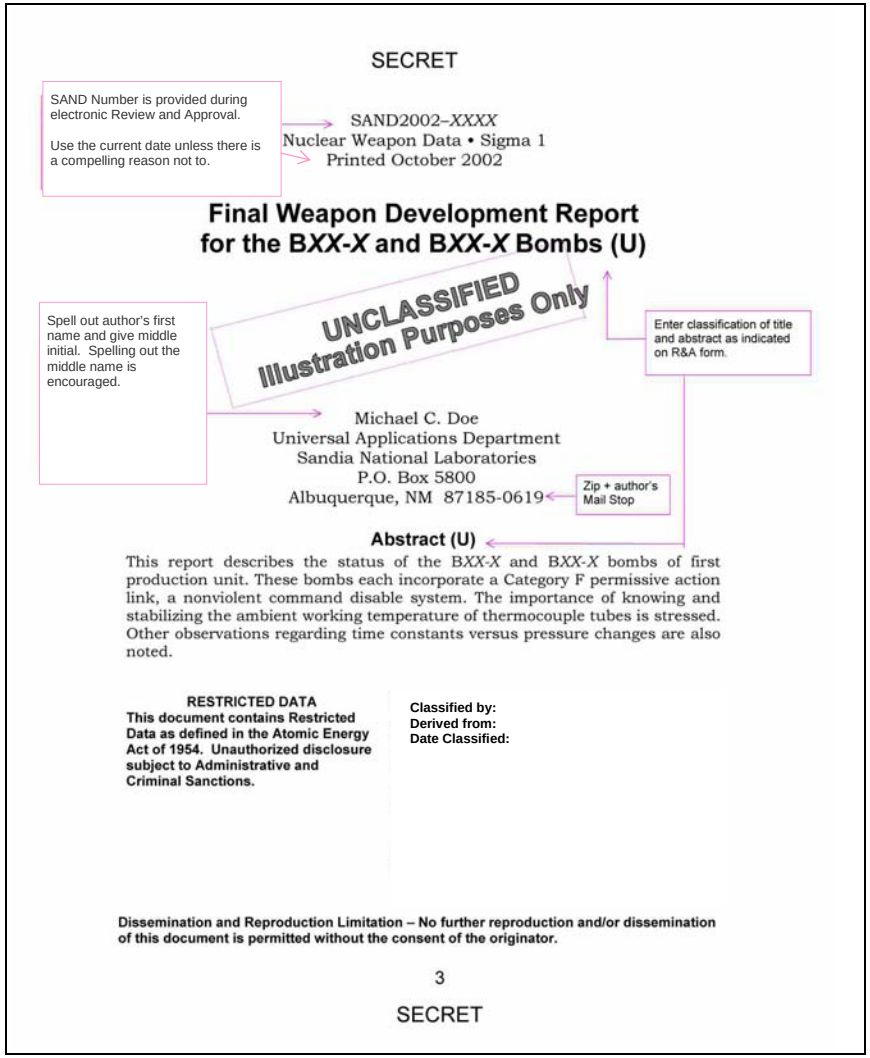
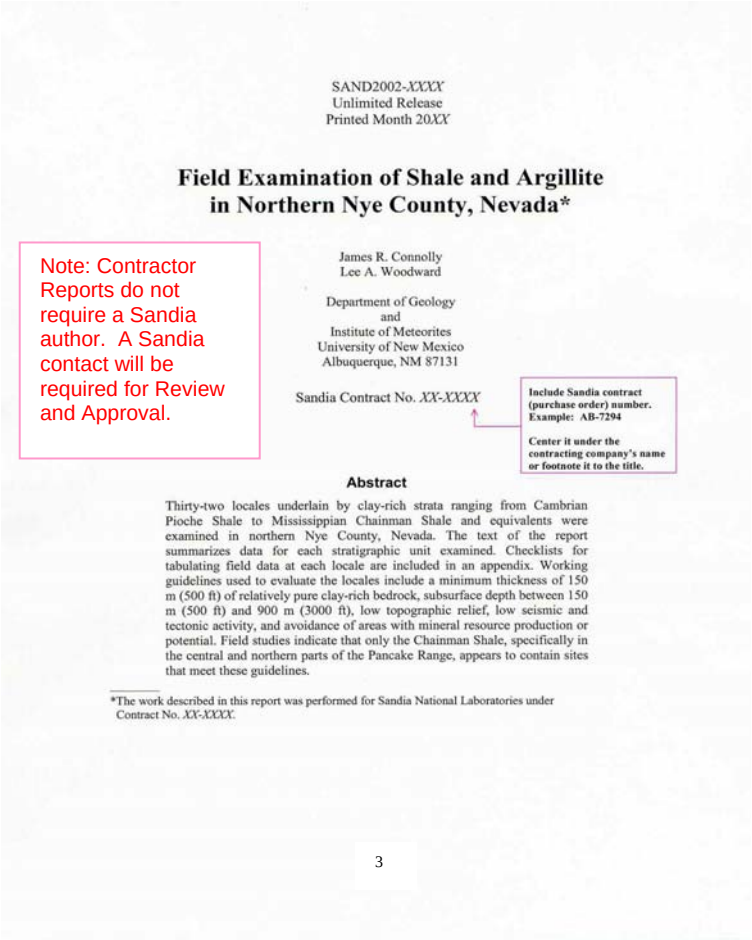


Figure 5-6. Classified Title Page.

Multiple authors:	Frank Biggs, Marion P. Apodaca, and Clarence R. Mehl Test Planning and Diagnostics Department Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185-3415
Two or more departments:	J. William Rogers, Jr., and Stephen J. Ward Initiating and Pyrotechnic Components Department Ronald A. Guidotti Exploratory Batteries Department Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185-2356
Sandia and an outside company:	Randall R. Nason and August E. Binder Project Engineering Department Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185-0156 John L. Darby Science and Engineering Associates, Inc. Albuquerque, NM 87190
Editor:	Randall R. Nason, Editor Project Engineering Department Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185-9824
Authors and editor:	Frank Biggs and Marion P. Apodaca Test Planning and Diagnostics Department Edited by Stephen J. Ward Initiating and Pyrotechnic Components Department Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185

Figure 5-7. Multiple Authors on Title Page.



SAND2002-*XXXX*
Unlimited Release
Printed Month 20*XX*

Field Examination of Shale and Argillite in Northern Nye County, Nevada*

James R. Connolly
Lee A. Woodward

Department of Geology
and
Institute of Meteorites
University of New Mexico
Albuquerque, NM 87131

Sandia Contract No. *XX-XXXX*

Abstract

Thirty-two locales underlain by clay-rich strata ranging from Cambrian Pioche Shale to Mississippian Chainman Shale and equivalents were examined in northern Nye County, Nevada. The text of the report summarizes data for each stratigraphic unit examined. Checklists for tabulating field data at each locale are included in an appendix. Working guidelines used to evaluate the locales include a minimum thickness of 150 m (500 ft) of relatively pure clay-rich bedrock, subsurface depth between 150 m (500 ft) and 900 m (3000 ft), low topographic relief, low seismic and tectonic activity, and avoidance of areas with mineral resource production or potential. Field studies indicate that only the Chainman Shale, specifically in the central and northern parts of the Pancake Range, appears to contain sites that meet these guidelines.

*The work described in this report was performed for Sandia National Laboratories under Contract No. *XX-XXXX*.

3

Note: Contractor Reports do not require a Sandia author. A Sandia contact will be required for Review and Approval.

Include Sandia contract (purchase order) number. Example: AB-7294

Center it under the contracting company's name or footnote it to the title.

Figure 5-8. Title Page for Contractor Report.

Contents

Executive Summary 7
Nomenclature 8
Introduction 9
Purpose 10
History 11
Scope 13
Geologic Aspects 14
Gravity Data 15
Hydrology 15
Caprock 23
SPR System Considerations 30
Cavern Configurations 30
Cavern Integrity Issues 35
References 53
Appendix A – Bayou Choctaw Regional Geologic History 59
Appendix B – Bayou Choctaw Well Data 63

Figures

1 Well locations and cross section index 15
2 Salt stock configuration, (a) Isometric view and (b) Contour of top of salt 18
3 Strategic petroleum reserve caverns 33

Tables

1 Stratigraphic nomenclature and geologic column 27
2 Geotechnical data; strategic petroleum reserve caverns 32

Comments:

Format. Present the contents listing in a format that clearly distinguishes the organization of the report. One way to do this is to insert a space above major divisions and indent subheads appropriately. Another is to use bold print for the major divisions, as is done here.

Figure numbers. Use only number designators in the number column. Do not use letter suffixes (a, b or A, B). Rather, use a composite figure title and include the (a) and (b) (or A and B) subtitles as part of the composite as in the Figure 2 listing above.

Figure captions. Use only the actual caption. Do not include descriptive text. Although copying the full caption with descriptive matter is faster and easier for the author, the extra text prevents quick and easy identification of the main figure topic.

Figure 5-9. Contents Page.

5.8 Executive Summary

The Executive Summary (or Summary) is optional. It begins on a right-hand (odd-numbered) page. It may be treated as separate from the body of the text. It may also be in the body of the report as the first section. It is a self-contained, concise restatement of the major points in the body of the report. It includes information on how the work was done, the nature and purpose of the investigation, equipment and processes used, the results, and primary conclusions or recommendations.

5.9 Acronyms and Abbreviations

An Acronyms and Abbreviations list may be included if it is useful to the reader. It precedes the body of the report. The list begins on a right-hand (odd-numbered) page unless it is only one page long. A blank page follows it if it ends on an odd page (so that the body text may begin on an odd-numbered page).

Words that are not capitalized in their expanded form should not be capitalized when given in the list (e.g., IC – integrated circuit).

NOTE:
Words that are defined rather than expanded from the shortened form may be placed in a glossary in the back *matter*.

5.10 Body of the Report

The body of the report begins on a right-hand (odd-numbered) page. It may consist of chapters (shorter documents are usually divided into sections, not chapters) or sections. Numbered headings may be used, but it is desirable to limit them to two decimal places (e.g., 1.3.4). Major sections may be run together in a smaller report (few

than 50 pages) but must begin on a right-hand (odd-numbered) page in longer reports. The report typically begins with an introduction and ends with a summary, conclusions, or recommendations section.

5.11 References and Bibliography

The References or Bibliography section follows the body of the report. References do not include items from the Appendices, which should have their own references or bibliography sections, if needed. A references section includes listings for materials quoted or referred to in the text. References are tied to particular passages in the body of the text. A bibliography may include materials consulted but not cited. A document might have either, both, or neither. Section 6.3 shows the references styles used at Sandia.

5.12 Back Matter

Back Matter should be numbered in sequence following the last page of the body of the report. If chapters and sections have previously begun on right-hand (odd-numbered) pages, so should the glossary, appendices, and index.

Glossary

A Glossary is optional. The glossary defines terms that are used in the text that might be unfamiliar to some of the readers.

Appendices

Appendices are optional. Appendices support the text, but are treated separately. References in an appendix are placed in the references list for that particular appendix. They should begin on an odd-numbered page.

If an appendix is itself a publication, it may have all the components of a report, including its own contents list and page numbering. It may be necessary to reduce the pages to include the SAND Report page numbers and markings. In using previously published documents, the author is cautioned to observe copyright and sensitivity and distribution limitations.

Index

An index is optional. An index may be set up to update automatically when page numbers change. Otherwise, it must be constructed when the final paging of the document has been determined.

5.13 Distribution

The last item in the report is the distribution list. Some access limitations may require a different heading for the list (check Appendix A). The distribution list may begin on an odd- or even-numbered page, but lists with multiple pages should begin on an odd-numbered page. Do not list this section in the Table of Contents. External addresses are listed first (with any foreign addresses last). (External recipients of a classified document are arranged by increasing classified mail channels. All recipients' authorization to receive classified mail must be verified.) Sandia addresses are listed by increasing mail stops (Figures 5-10 and 5-11, Figure 5-12 for CA).

The following are guidelines for assembling the distribution list:

- Use discretion in compiling the distribution list. Keep the number of copies as low as possible.
- Arrange the internal recipients by increasing Mail Stop numbers.

- The number in the first column is the number of copies going to a single address. If one of the recipients in an "Attn:" list is to receive more than one copy, place the number for that recipient in parentheses following the name. Example: Attn: B. W. Reinhart (3).

Classified mail to Sandia/CA must go through an approved mail channel and is therefore considered external. Classified mail going from Sandia/CA to Sandia/NM is also considered external and requires a Mail Channel.

Several options are available for distribution of documents, and any of them or a combination of them is acceptable. Contact Printing Services after R&A to make distribution arrangements.

Internal Distribution – Distribution within Sandia requires a name, organization, and mail stop. Transportation Services can distribute bulky items or those in several boxes. This takes four to five days and possibly as long as a week.

External Distribution – Distribution outside Sandia is external distribution and requires full addresses. Bulk mail may be used for some domestic deliveries (contact Printing Services). Foreign mailings will be First Class, depending on the nature of the document.

Customer Distribution – If the customer is handling the distribution, that should noted on the print order. The printed materials will be delivered to you, or you may pick them up at Printing Services. Otherwise, the order is shipped based on the Distribution List.

UNCLASSIFIED Documents:
Unlimited Release, Limited Release. The following "housekeeping" copy should appear at the end of each SAND Report distribution list.

1	MS 0899	Technical Library, 9536 (electronic copy)

CLASSIFIED Documents:
For *classified* reports sent to SNL/CA use Mail Channel and Org. number — not Mail Stop.

Put Central Technical Files at end of external distribution and Technical Library at end of internal distribution.

1	M2497	Central Technical Files, 8944 (1 paper copy)
2	MS 0899	Technical Library, 9536 (1 electronic and 1 paper copy)

For particular kinds of publications, add on the following as appropriate:

If the document has a "Patent Caution" or "Patent Interest," add the following to the END of the housekeeping copies:

1 MS 0161 Legal Intellectual Property, 11500

For CRADA documents, add the following to the END of the housekeeping copies:

1 MS 0115 OFA/NFE Agreements, 10112

For LDRD documents, add the following to the END of the housekeeping copies:

1 MS 0123 D. Chavez, LDRD Office, 1011

Note: Printing Services will send the housekeeping copies to the libraries if you have hard copies printed through them. If you do not have hard copies printed through the print shop, you may email unclassified electronic files to SANDDOCS@SANDIA.GOV, referencing file type and SAND number. See Section 4.1 for other delivery options and guidelines.

Figure 5-10. Sandia/NM Distribution List "Housekeeping" Copies.

6	M0701	U.S. Department of Energy Attn: Maj. Gen. W. Hoover Washington, DC 20545
3	M0830	Lawrence Livermore National Laboratory Attn: R. F. Catham, L125 (2) A.B. Palmen, L394 P.O. Box 808 Livermore, CA 94550
1	M2497	Central Technical Files, 8944 (1 paper copy)
1	M0800	J.S. Kendall, 8417 [Use Mail Channel for CA listings]
1	M0800	P.R. Walker, 8417
5	MS 0314	L.G. Grant, 9811
8	MS027	J.R.Dallas, 1502
2	MS 0899	Technical Library, 9536 (1 electronic and 1 paper copy)

Figure 5-11. Distribution List (SNL/NM) Sample, Classified.

Use Mail Stop and Org. Number. Mail sent without Mail Stops will be delayed.

UNCLASSIFIED Documents:
Unlimited Release, Limited Release. The following "housekeeping" copy should appear at the end of each SAND Report distribution list.

1	MS 0899	Technical Library, 9536 (electronic copy)

CLASSIFIED Documents:
Put Central Technical Files at end of internal distribution and Technical Library at end of external distribution.

For *classified* reports sent to SNL/NM use Mail Channel and Org. number — not Mail Stop**.**

1	MS 9018	Central Technical Files, 8944 (1 paper copy)
2	M0501	Technical Library, 9536 (1 electronic and 1 paper copy)

For particular kinds of publications, add on the following as appropriate (in CA, use Classified Mail Channel number for classified mail to SNL/NM):

If the document has a "Patent Caution" or "Patent Interest," add the following to the END of the housekeeping copies:

1 MS 0161 Legal Intellectual Property, 11500

For CRADA documents, add the following to the END of the housekeeping copies:

1 MS 0115 OFA/NFE Agreements, 10112

For LDRD documents, add the following to the END of the housekeeping copies:

1 MS 0123 D. Chavez, LDRD Office, 1011

Note: See Section 4.1 for delivery options for electronic files to the libraries.

Figure 5-12. Sandia/CA Distribution List "Housekeeping" Copies.

6. ADDITIONAL GUIDELINES

6.1 Trademarks, Copyrights, and Permission to Use Another's Work
6.2 Equations
6.3 References

6.1 Trademarks, Copyrights, and Permission to Use Another's Work

Trademarks

A trademark is a symbol, word(s), or name that identifies a company's specific product. Authors are responsible for verifying whether product names mentioned in SAND Reports are trademarked. If so, these products need to be identified, at least on first use.

If a non-Sandia product is *registered* with the United States Patent and Trademark Office and is mentioned in a SAND Report or other communication product, use the ® symbol following the trademarked product's symbol, word(s), or name on first use. Identify the owner of the trademark in a footnote or within the text of the report. An example footnote might be "Macintosh® is a registered trademark of Apple Computer, Inc."

A trademark can also be established by use alone, without registration. If a trademark has been *claimed* but has not been registered, use the ™ superscript. As with the registered trademark, identify the owner of the unregistered trademark in a footnote or within the text of the report. An example footnote might be "ProductZ™ is a trademark of ABC, Inc."

With few exceptions, the names of products generated within Sandia should not be followed by the ® or the ™ symbols because Sandians usually do not apply for trademarks. If you want to describe a Sandia product as a trademarked product, Sandia's Legal Department (in Legal Intellectual Property) asks that you clear the wording with them.

Remember the following suggestions when writing about products with trademarks:

A trademark modifies a product category (for example, Macintosh computer, Crayola crayons). The product category should be in lowercase so that it does not compete with the trademark for prominence.

Spell a trademark as it is registered. For example, if the product's official name is in all caps, spell it in all caps all the time. If the trademark is registered in a particular typeface or style (such as italics), display it accordingly.

The Chicago Manual of Style (15th edition, section 8.162) offers the following advice, "Although the symbols ® and ™ often accompany trademark names on product packaging and in promotional material, there is no legal requirement to use these symbols, and they should be omitted wherever possible." Including them on first use would be a courtesy.

Copyrights

DOE copyright instructions for open literature publications state that in submitting the manuscript to the publisher, the author must include the following statement (and use the same language on the copyright transfer form if the publisher sends the author a transfer form):

> The submitted manuscript has been authored by a contractor of the U.S. Government under contract No. *(insert the contract number)*. Accordingly, the U.S. Government retains a nonexclusive, royalty-free license to publish or reproduce the published form of this contribution, or allow others to do so, for U.S. Government purposes.

Reference: Operating Contract with DOE

Should a journal or other publisher insist on a transfer of copyright, discuss the situation with Sandia's Legal Department. If you receive a copyright transfer or license form from the publisher, prior to signature and submission, these forms must be sent to Legal (Madelynne Farber) for review and verification of compliance with Sandia's prime contract. Electronic documents may be emailed to mjfarbe@sandia.gov. Hard copies may be sent via interoffice mail (Copyrights, MS-0141) or faxed to 505-844-9955.

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Send the request, along with a self-addressed return envelope, to the permissions department of the publisher in question. The Technical Library will assist you in getting the publisher's address if you do not have it. Contact the Information Desk at 845-8287 for assistance.

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Sandia National Laboratories
Albuquerque, NM 87185-XXXX
March 14, 1997

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Permissions Department
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New York, NY 10017

Permissions Department:

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> *Unnumbered figure "Four offshore oil platforms are compared schematically with two onshore structures of comparable height" on pages 40-41 of Ellers, Fred S., Advanced Offshore Oil Platforms, Scientific American, V. 246, no. 4, 1982.*

A copy of the figure is attached.

The figure will be used in a Sandia report entitled _____, SAND*97*–_____. This is *an internal report that will be available to the public through NTIS after its initial distribution to approximately* _____*individuals.*

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John J. Doe
Title (if appropriate)
Org. Name and Number
MS ####

Figure 6-1. Example of a Letter to a Publisher of Copyrighted Material.

6.2 Equations

Procedures for Inputting from Handwritten Copy

Pay special attention to

Superscripts and subscripts
Look-alike characters:

a, α, $\propto$; β, δ; w, ω (omega, not script w); Γ, T; η, n; κ, k;
γ, λ; μ, u; ν, υ, v; ι, i; ρ, p; ξ, ζ; τ, t; χ, x

Continuity of equation numbers. (Not all equations require numbers, but the ones that are numbered must be in unbroken sequence.)

Formatting Equations

Line Spacing

The spacing of lines in equation typing depends on the type of equipment you have:

Use single-spaced text if your equipment prints subscripts and superscripts within the 1-line space.
Use 1½-line spacing if it does not.
Use double-spaced text only if nothing else works.

The final product should be easy to read, but not excessive in spacing.

Centered, Indented, or Flush Left

Centered equations are preferred. You may also indent all displayed expressions by a standard paragraph indent or even start them flush with the left margin. Special formatting requirements may be specified by an organization or by a particular professional society.

Equation Number

Enclose the equation number in parentheses and place it flush with the right margin, either even with the last line of the equation or even with the center line of the equation.

Punctuation

Two styles of punctuation are acceptable: *text* style and *open* style.

Text Style: To punctuate in the *text* style, read the displayed equation as if it were text and punctuate it accordingly. A displayed mathematical expression is often the continuation or completion of the text that introduces it, as in the following example.

...This solution resulted in

$$L = \log\left|\frac{TT_o - 1 + pp_o}{TT_o - 1 - pp_o}\right|$$

$$= T_o - p_o \cos\theta$$

$$= \log\left|\frac{T + p}{T - p}\right|$$

where

T = time
p_o = perpendicular, and
pp_o = perpendicular pitch.

Open Style: To punctuate in the *open style*, use no comma or periods at the end of any equation line (although you may use them *within the line*).

Spacing within the Equation

Use ***no*** space in the following instances:

Between a number and the symbol it multiplies or between two or more symbols that multiply each other: 3b; 5aB; 3δxy.

Before or after superscripts and fences:

$$3x_{y-2}d;\ \exp\left[(y-1)/(z+n)\right]$$

Within subscript or superscript expressions: b^{n-1} $\lim_{a\to 0}$

Use ***one*** space as follows:

Before and after verbs: a = b; y ≥ 8z

Before and after conjunctions: a + b; (b^{n-1} + 2bx)

Before but not after +, –, or ± when they are used as adjectives:

$$-x(a+b) = -3;\ x = \pm 3$$

After commas: $y_1, y_2, \ldots, y_n$

Before and after sigma-class symbols:

$$a\int x\,dy \quad \lim_{c\to p}\inf\sum_{n\text{-}p}^{\infty} f^{(n)}(c)\mathrm{II}\ \ \mathrm{ah}$$

Before and after the following functions:

sin:	a sin x;	lim:	$\lim_{c\to p}$ inf p;	tanh:	2 tanh θ
log:	log x;	exp:	exp a^n;	log log:	log log x

If any of the above functions is preceded or followed by a superscript or subscript, parenthesis, brace, or bar, then the space between them is eliminated: [(x – y)log x] ($a_2$sin x) sin(a – x).

Before and after a vertical rule that appears singly or a colon that is used as a mathematical symbol: a | b as : a ∈ A A = (x | P)

Before a back inferior (a subscript placed before a term), as the $_2$x in this example: a $_2$xb b $_1$x$_2$ah.

Before and after ds, dp, dx, and similar combinations of d and another symbol following: ∫ f(x) dx ∫∫∫ dr dθ dr

Superscripts and Subscripts in the Same Expression

When superscripts and subscripts are used together, align them consistently (either stacked or staggered). If the terms have several characters, you can change the form as in the third column below.

Superscripts and subscripts	Staggered	Changed Form
x_m^n	$x_m{}^{\mathrm{n}}$	
x_c^{a-b}	$x_m{}^{\mathrm{a-b}}$	$(x_c)^{a-b}$
x_{ay}^{mn}	$x_{ay}{}^{\mathrm{mn}}$	$(x_{ay})^{mn}$

Fractions

Use slashed fractions (1/8, 1/4) in text and in superscripts and subscripts; in display, use barred fractions (or a combination if that adds clarity—see **In Display**).

Slashed Fractions in Text

Use *slashed fractions* in text to avoid unattractive, spread-out lines.

Slashed Fractions in Superscripts and Subscripts

Use slashed fractions in superscripts and subscripts. The single-key fraction ($1/8$, $1/4$) may be too small to read, and the barred, or stacked, fraction is too awkward.

This	Not This
$x^{1/8}$	$x^{1/8}$
$y^{(a+b)/(x-y)}$	$Y^{\frac{a+b}{x-y}}$

Note use of parentheses to retain clarity.

Because authors usually focus on the information rather than the format when they write, they often use stacked fractions within the text. To change stacked fractions to slashed fractions, follow the guidelines below:

Stacked	Replace with this:	Or this:	Not with:
$\frac{a+1}{b}$	$(a + 1)/b$	$(a + 1)b^{-1}$	$a + 1/b$
$\frac{a}{(x+1)^3}$	$a/(x + 1)^3$	$a(x + 1)^{-3}$	
$\sin \frac{a}{x}$	$\sin(a/x)$	$\sin\ a/x$	

In Display

Use *stacked*, or *barred*, fractions in display.

Exception: The appearance of multilevel stacked fractions can often be improved by changing the stacked portion in the numerator to a slashed fraction, and the same in the denominator. See the following example:

Stacked	Replace with one of these:	
$\frac{\sin a}{x}$	(sin a)/x	sin a/x
$\frac{a}{x^3}$	a/x^3	ax^{-3}
$\frac{a}{(b-c)^2}$	$a/(b-c)^2$	$a(b-c)^{-2}$
$\frac{\partial}{\partial\partial}F(u,k,\theta)$	$\partial F(u,k,\theta)/\partial\,\partial$	$(\partial/\partial\partial)F(u,k,\theta)$

Exponential Function

The terms *e* [as in e^x] and *exp* [as in exp $(x^2 - 1)$] mean the same thing and can be interchanged as necessary to accommodate space. Consistency in the form used is not necessary; both forms can be used within the same sentence or display.

To avoid double superscript:

Instead of:	**Use:**
e^{x^2-1}	$\exp(x^2 - 1)$

To avoid fractions in the superscript:

Instead of:	**Use:**
$e^{\frac{a-b}{c+d}}$	$\exp\left(\frac{a-b}{c+d}\right)$ or $\exp((a-b)/(c+d))$

Matrices and Determinants

Always set matrices and determinants in display. Set them in columns and rows and enclose them with brackets, parentheses, or lines:

$$\begin{bmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 1 & 2 & 3 \end{bmatrix} \qquad \begin{vmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 1 & 2 & 3 \end{vmatrix}$$

Line Breaks

When an equation is too long for one line, break it according to the following rules:

Break before a verb that does not occur within fences.

Break at any other space (see “spacing”), except

- after a collective sign, do not break until there is an operator outside of fences
- after an integral sign ($\int$), do not break until a *d* occurs; then break after the next punctuation, or before a verb.

When a set of fences is followed directly by another set of fences, break between them and insert a sign of multiplication (· or ×) before the carried-over set of fences.

Exception: This rule does not apply if the fences are preceded by a sigma-class symbol or if they have a slash between them.

Alignment of Line Breaks

If a single expression contains a series of equal signs, break at the equal sign and align the expressions vertically on the equal signs.

When breaking at a point other than an equal sign, align subsequent lines of the equation with the first character following the equal sign:

$$\frac{\mathrm{d}\sigma}{\mathrm{d}E_k\, d\Omega} = \frac{7.95 \times 10^{-26}}{8\pi\, 137}\,\frac{1}{E_k}\,\frac{\mathrm{p}}{\mathrm{p_o}}\left|\frac{8\sin^2\theta(2T_o^2+1)}{p_o^2\Delta_o^4} - \frac{2(5T^2+2TT_o+3)}{p_o^2\Delta_o^2}\right.$$

$$\left. - \frac{2\left|p_o^2 - E_k^2\right|}{Q^2\Delta_o^2} + \frac{4T}{p_o^p\Delta_o} + \frac{L}{pp_o}\right|\frac{4T_0\sin^2\theta\left|3E_k - p_o^2 T\right|}{p_o^2\Delta_o^4}$$

6.3 References

As long as the basic information is included that permits a reader to locate the reference source (author, title, publisher, place of publication, and date of publication), the author has considerable latitude in choosing a reference style that is appropriate for the nature of the material and may elect to follow a style accepted by the professional societies in that field. The guidelines given here are for the convenience of Sandia authors and may be modified to suit their particular needs. The reference style loosely follows *The Chicago Manual of Style.* References may be to Web sites or to items on a Web site, such as books and papers, for which. publication data should be included along with the Web address.

Two methods of citing references are commonly used at Sandia:

- Sequential
- Author-Date

Figure 6-2 compares the two styles.

Sequential References

Cite numbered references in text with sequential Arabic numbers either superscripted or on the line in brackets. When you make a subsequent reference to a previously cited source, repeat the number assigned on the first reference. The numbers correspond to the References section, where the items cited are listed sequentially.

Text Example:

> You can refer to Reference 1 in text, or you can use square brackets [1] or a superscript to mark your references.[3,5-8, 10,12,14] Note that superscripts are placed *outside* the punctuation marks, except when dashes are used. References in brackets or parentheses are placed *inside* all punctuation marks but quotation marks. If an exponent or footnote could be confused (e.g., 13 cm^2), then make the reference in the line: 13 cm (Ref. 2).

Reference List Example:

1. R. L. Smith, R. M. Thompson, J. D. Doe, and T. J. Jones, *Computer Modeling of Gas Lasers.* Plenum Press, New York, 1978.

Author-Date References

The author-date style is useful when new references will be added to the list because the references are listed alphabetically by author. In the sequential reference style, renumbering of the references following the added item would be necessary.

The author-date style varies from the sequential style in three respects:

The order of listing in the References section is alphabetical by the author's last name.
A hang indent is often preferred.
The date is placed immediately after the author's name.

Therefore, you can also use Table 6-1 as a guide to setting up author-date references.

Text Example:

> References are cited in text using the name of the author and the date of the publication (Jones 1998) or multiple authors (Jones and Lehigh 1997). If an author has two or more works in the same year, these are designated a, b, c, etc. (Jones 1999a; 1999b). You can refer to a work as in Smith (1998, part 2), and you can refer to specific parts of a work. You can cite multiple references (Jones 1999a; Jones and Lehigh 1997; Smith 1998).

Reference List Example:

W. G. Moffat, 1979, *The Index Binary Phase Collections.* General Electric Co., Schenectady, NY.

NOTE

To facilitate alphabetization by the author's last name, it is a common and permissible practice to list the first author's last name first in the author-date reference styles*:*

Jones, R. G., and William C. DeVore, 1980, *A Study of Magnetic Fields*. William Brown Publishers, New York, NY.

Abbreviated References

The reference list in a publication that will be distributed only to a select group of readers, all of whom are familiar with the subject of the report and the references listed, may be done in abbreviated style, that is,

Do not italicize title or enclose it in quotation marks.
Initial-cap first word only of a single-volume publication (such as a book or report).
Initial cap all major words of a journal.
Use abbreviated style for journal volume and page (22:131-39).

Examples:

J. H. Adlam and J. N. Burcham, 1964, *in* J Sci Instrum 43:93.

M. Hansen, 1958, Constitution of binary alloys. New Book Co.

W. G. Moffatt, 1979, The index to binary phase collections. General Electric Co., Schenectady, NY.

SEQUENTIAL

1. F. L. Oetting, M. H. Rand, and R. J. Ackerman, in *The Chemical Thermodynamics of Actinide Elements and Compounds, Part I: The Actinide Elements*. International Atomic Energy Agency, Vienna, Austria, 1989.

2. M. Hansen, *Constitution of Binary Alloys*. New Book Co., New York, NY,1990.

3. F. A. Shunk, *Constitution of Binary Alloys, Second Supplement*. McGraw-Hill Book Co., New York, 1991.

4. A. N. Vol'skii and Y. M. Sterlin, *The Metallurgy of Plutonium*, Translated From Russian. Jerusalem, Israel, Program for Scientific Translations; available from the U.S. Dept. of Commerce, Clearinghouse for Federal Scientific and Technical Information, Springfield, VA, 1995.

5. W. G. Moffatt, *The Index to Binary Phase Collections*. General Electric Co., Schenectady, NY, 1989.

6. J. G. Parr and A. Hanson, *An Introduction to Stainless Steel*. American Society for Metals, Akron, OH, 1995.

7. D. F. Bowersox and J. A. Leary, The Solubilities of Selected Elements in Liquid Pu. II. Titanium, Vanadium, Chromium, Manganese, Zirconium, Niobium, Molybdenum and Thulium, in *J Nuc Mat* Vol. 27, No. 2, pp. 181-86, February 1996.

AUTHOR-DATE

Hansen, M., 1989, *Constitution of Binary Alloys*. New Book Co., New York, NY.

Moffatt, W. G., 1994, *The Index to Binary Phase Collections*. General Electric Co., Schenectady, NY.

Nevada Department of Conservation and Mineral Resources, 1991a, *Regulations for Drilling Water Wells*. Carson City, NV, 36 p.

Nevada Department of Conservation and Mineral Resources, 1991b, *Regulations and Rules of Practice for Drilling Oil and Gas Wells*. Carson City, NV, 26 p.

Oetting, F. L., M. H. Rand, and R. J. Ackerman, 1989, *The Chemical Thermodynamics of Actinide Elements and Compounds, Part I: The Actinide Elements*. International Atomic Energy Agency, Vienna, Austria.

Parr, J. G., and A. Hanson, 1995, *An Introduction to Stainless Steel*. American Society for Metals, Akron, OH.

Shunk, F. A., 1990, *Constitution of Binary Alloys, Second Supplement*. McGraw-Hill Book Co., New York.

Vol'skii, A. N., and Y. M. Sterlin, 1995, *The Metallurgy of Plutonium, Translated From Russian*. Jerusalem, Israel, Program for Scientific Translations; available from the U.S. Dept. of Commerce, Clearing-house for Federal Scientific and Technical Information, Springfield, VA.

Figure 6-2. Comparison of Sequential and Author-Date Reference Sections.

Table 6-1. Reference Examples

Books
R. L. Smith, R. M. Thompson, J. D. Doe, and T. J. Jones, *Computer Modeling of Gas Lasers.* Plenum Press, New York, 1978. [Multiple Authors]
F. A. Hopf, Amplifier Theory, in *Physics of Quantum Electronics*, S. F. Jacobs, M. Sargent III, and M. O. Scully, ed., vol. I, pp. 77-176. Addison-Wesley, Reading, MA, 1974. [Multiple Editors]
Blasters Handbook, 17th ed. E. I. duPont de Nemours and Co., Wilmington, DE, 1977. [General Editorship]
Manuscript Preparation and Copyediting, in *The Chicago Manual of Style*. The University of Chicago Press, Chicago, IL, 1982. [Chapter]
Multiple-volume Works
A. B. El-Kareh and J. C. J. El-Kareh, *Electron Beams, Lasers, and Optics*, vol. I and II. Academic Press, NY, 1970. [General title]
Conrad O. Jones, *Operation Plowshare*, vol. III of *Studies in Peaceful Uses of the Atom.* The Isolation Press, Los Alamos, NM, 1978. [Individual title for each volume]
Journal Article
D. B. Haidvogel, A. R. Robinson, and E. E. Schulman, The Accuracy, Efficiency, and Stability of Three Numerical Models With Application to Open Ocean Problems. Sandia National Laboratories report SAND86-1052J (submitted to *Journal of Computational Physics*). [Submitted]
G. L. Weatherly and P. J. Martin, On the Structure and Dynamics of the Oceanic Bottom Boundary Layer, Sandia National Laboratories report SAND87-2213J (to be published in *Journal of Computational Physics*). [Accepted but not published]
F. Schreiner, S. Fried, and A. M. Friedman, Measurement of Radio-nuclide Diffusion in Ocean Floor Sediment and Clay, in *Nuclear Technology*, vol. 59, pp. 429-38, 1982. [Published]
Conference Paper
G. L. Weatherly and P. J. Martin, On the Structure and Dynamics of the Oceanic Bottom Boundary Layer. Sandia National Laboratories report SAND87-2213C. Fifth Annual NEA-Seabed Working Group Meeting, Bristol, England, March 3-5, 1987. [Unpublished]
G. L. Weatherly and P. J. Martin, On the Structure and Dynamics of the Oceanic Bottom Boundary Layer, in *Fifth Annual NEA-Seabed Working Group Meeting*, held in Bristol, England, March 3-5, 1987. Sandia National Laboratories, Albuquerque, NM, 1988. (**Note**: The name of the company or society publishing the proceedings is listed as the publisher. In this case it was Sandia.) [Published in Proceedings]
Reports
Seabed Programs Division 6334, *The Subseabed Disposal Program: 1983 Status Report*, SAND83-1387. Sandia National Laboratories, Albuquerque, NM, October 1983. [Unclassified]
Author, *Report Title (U)*, SANDxx-xxxx. Sandia National Laboratories, Albuquerque, NM (SRD), August 1997. [Classified]

Thesis
C. W. Young, Depth Prediction for Earth-Penetrating Projectiles. PhD thesis, University of New Mexico, 1980.
Foreign Title
Ch'en Shich-ch'i, *Ming-tai shou-kung-yet ti yen-chiu*. (Studies on government-operated handicrafts during the Ming dynasty.) The Mandarin Press, Hong-Kong, 1978.
Translation
V. L. Bouch-Bruevich, *Electronic Theory of Heavily Doped Semiconductors*. American Elsevier Publishing Co., NY, 1966, translation.
Corporate Author
American National Standards Institute, *Scientific and Technical Reports: Organization, Preparation, and Production.* ANSI Z39.18-198-X. American National Standards Institute, Inc., 1430 Broadway, NY, 1989.
Unpublished Data
D. G. True, Penetration of Projectiles into Seafloor Soils, Sandia National Laboratories memorandum to D. R. Anderson, December 10, 1982. [Memorandum, unclassified]
D. G. True, Penetration of Projectiles into Seafloor Soils (title classification), Sandia National Laboratories memorandum (memorandum classification) to D. R. Anderson, December 10, 1982. [Memorandum, classified]
Statement by C. J. Osgoode, solar energy engineer, in personal interview at Barstow, CA, November 13, 1979. [Interview]
Opinion expressed by Conrad O. Jones, engineer, in an address "Is solar power cost effective?" at the University of New Mexico, Albuquerque, NM, December 31, 1978 (tape on file at the Sandia National Laboratories Reference Library). [Speech]

Letter from Conrad O. Jones, Division Supervisor, Engineering Division 0001 of Sandia National Laboratories, December 31, 1978. [Letter]
Professional Paper
W. H. Bradley, Origin and Microfossils of the Oil Shale of the Green River Formation of Colorado and Utah. U.S. Geological Survey Professional Paper 168, 1931.
Standard
Calibration Techniques for the Calorimeter Assay of Plutonium-Bearing Solids Applied to Nuclear Materials Control, ANSI N15.22-1975. American National Standards Institute, Inc., New York, 1975.
Newspaper Article
Study Labels Alcohol Fuel As Threat to Food Supply, *Dallas Times Herald*, March 16, 1980, Sec. A, p. 14.
Legal Document
43 CFR 192.14. ← (Code of Federal Regulations) 21 F.R. 623. ← (Federal Register) New Mexico Revised Statutes, Title 24, Article 7. U.S. Congress, Uranium Mill Tailings Radiation Control Act of 1978. Public Law 95-604, 95th Congress, November 1, 1978.

APPENDIX A: MARKINGS AND LEGENDS

All SAND documents require a special marking or legend or both. This table lists the markings and legends to be used with various types of documents. To ensure proper physical protection, the appropriate markings and legends should be placed on the draft copy as soon as possible.

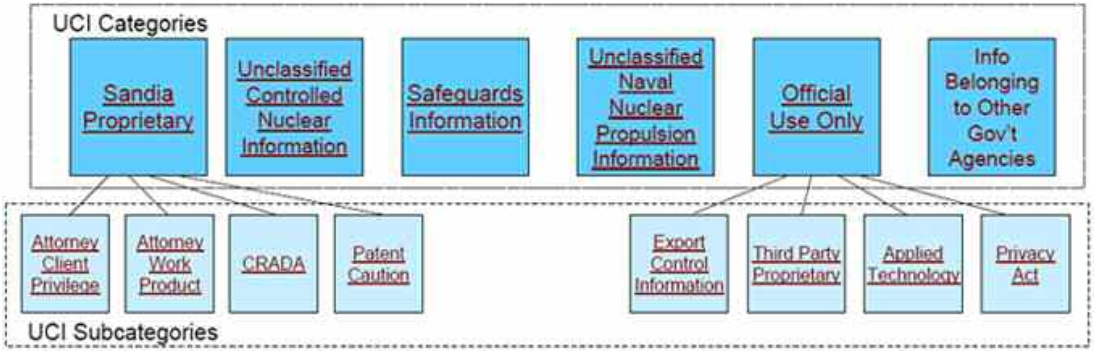
A.1 Unclassified Unlimited Release Documents

Name of Notice	Instructions	Sample
Unclassified Unlimited Release	Cover/title page – top block under SAND No. Bottom of cover	**Unlimited Release** **Approved for public release; further dissemination unlimited.**

A.2 Unclassified Controlled Information (UCI)

In addition to the markings specified here, check the linked sites for other marking and protection control requirements, including special cover sheets or envelopes. The table entries are referenced to Classification Handbook for Derivative Classifiers at SNL or to various Sandia CPRs giving guidance on OUO:

- Classification Department Web site, Classification Handbook for Derivative Classifiers at SNL: 4225 Classification
- New Doe Order Web site (has sample OUO covers): http://sns.sandia.gov/resource/newdoeorder/
- Sandia CPR, Sandia Management of Information Throughout Its Life Cycle: http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434



Refer to CPR for marking of Sandia Proprietary Information (Legal, Procurement, Human Relations, Lockheed Martin, and Protected CRADA) as shown above.
http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434

Name of Notice	Instructions	Sample
Naval Nuclear Propulsion Information http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434	Cover/title page – top block under SAND No. Cover and title page Top and bottom of each page Distribution is very limited. <u>Note:</u> NNPI may also apply to classified information.	(These instructions are for U-NNPI) **Naval Nuclear Propulsion Information** **NOFORN: This document is subject to special export controls and each transmittal to foreign governments or foreign nationals may be made only with prior approval of the Naval Sea Systems Command.** **No Foreign Dissemination** or **NOFORN**

Name of Notice	Instructions	Sample
Unclassified Controlled Nuclear Information (UCNI) http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover sheet: SF-1008-UCN is optional.	Cover/title page – top block under SAND No. Cover (UCNI legend) Add dissemination statement on cover and title pages. Cover, title page, and all internal pages top and bottom. Marking on interior pages may be limited to those pages containing UCNI if more convenient.	**Unclassified Controlled Nuclear Information** UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION NOT FOR PUBLIC DISSEMINATION Unauthorized dissemination subject to civil and criminal sanctions under Section 148 of the Atomic energy Act of 1954 as amended (42 USC 2168 Review Official: Name and Organization Date: _____ Guidance: (List all UCNI Guidance) **UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION** **NOT FOR PUBLIC DISSEMINATION** **Unauthorized dissemination subject to civil and criminal sanctions under section 148 of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2168)** **UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION** or **UCNI**

Name of Notice	Instructions	Sample
Official Use Only (OUO) http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover template: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	**See A.3 for subcategories.** Cover/title page – top block under SAND No. Cover (for documents to be excluded from Freedom of Information Act requests) Note: Use the organization name in the OUO box and the complete category exemption and number. Cover and title pages include the DOE dissemination statement. Place at top and bottom of each page. Bottom marking required; top marking is a Best Business Practice.	**Official Use Only / Exemption name or subcategory (e.g., Official Use Only / Circumvention of Statute / Export Controlled Information** **OFFICIAL USE ONLY** May be exempt from public release under the Freedom of Information Act (5 U.S.C. 522), exemption number and category: Department of Energy review required before public release. Name/Org: Date: Guidance: Exemption number is required. 1. N/A 2. Circumvention of Statute 3. Statutory Exemption Requires subcategory 4. Commercial/Proprietary Requires subcategory 5. Privileged Information 6. Personal Privacy 7. Law Enforcement 8. Financial Institutions 9. Wells **Further dissemination authorized to the Department of Energy and DOE contractors only; other requests shall be approved by the originating facility or higher DOE programmatic authority.** **OFFICIAL USE ONLY** or **OUO**

A.3. OUO Information

Name of Notice	Instructions	Sample
Applied Technology http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover template: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	**Include all OUO markings (refer to A.2)** Cover/title page – top block under SAND No. Cover Mark top and bottom of each page.	OUO Exemption 5, Privileged Information **Official Use Only / Applied Technology** **APPLIED TECHNOLOGY** **Any further distribution by any holder of this product or data therein to third parties representing foreign interests, foreign governments, foreign companies, and foreign subsidiaries or foreign divisions of U.S. companies shall be approved by the _____ [insert appropriate NE Program Office officials], U.S. Department of Energy. Further, foreign party release may require DOE approval pursuant to 10 CFR 810, and/or may be subject to Section 127 of the Atomic Energy Act.** **Further dissemination only as authorized by the originating facility or higher DOE programmatic authority; requester must possess appropriate security clearance, need-to-know, and facility approval for receipt and storage of classified documents by the DOE Office of Security Affairs.** Associate Deputy Assistant Secretary for Reactor Systems, Development, and Technology Associate Deputy Assistant Secretary for Reactor Deployment Deputy Assistant Secretary for Space and Defense Power Systems Deputy Assistant Secretary for Naval Reactors **OFFICIAL USE ONLY**

Name of Notice	Instructions	Sample
Export Controlled http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover template: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	**Include all OUO markings (refer to A.2)** Cover/title page – top block under SAND No. Add dissemination statement on cover and title pages. An appropriate legend must be used on cover page: ITAR – International Traffic and Arms Regulation EAR – Export Administration Regulations DOE – Department of Energy NRC – Nuclear Regulatory Commission Mark top and bottom of each page.	OUO Exemption 3, Statutory Exemption **Official Use Only / Export Controlled Information** **Further dissemination authorized to Department of Energy and DOE contractors only; other requests shall be approved by the originating facility or higher DOE programmatic authority.** **Export Controlled Information:** plus one of the following statements: **Treat this material per Department of State (DOS) International Traffic in Arms Regulations, 22 CFR 120-130. Information contained in this document is also subject to controls defined by the Department of Defense Directive 5230.25.** **Treat this material per Department of Commerce Export Administration Regulations, 15 CFR 730-774.** **Treat this material per Department of Energy Assistance to Foreign Atomic Energy Activity Regulations, 10 CFR 810.1.** **Treat this material per the Nuclear Regulatory Commission's Export and Import of Nuclear Equipment and Material Regulation, 10 CFR 110.** **OFFICIAL USE ONLY**

Name of Notice	Instructions	Sample
(*Non-Sandia Co. name*) Proprietary Information http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover template: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers Sandia will not publish or release PROP without the permission of the owner.	**Include all OUO markings (refer to A.2)** Cover/title page/back of cover top and bottom Top block under SAND No. Cover and title pages Add dissemination statement on cover and title pages. *Note: The abstract should not include any Proprietary Information.* Mark top and bottom of each page.	OUO Exemption 4, Commercial Proprietary **OFFICIAL USE ONLY** **(*Non-Sandia co. name*) Proprietary Information** **Official Use Only / (*Non-Sandia co. name*) Proprietary Information** **(*Non-Sandia co. name*) PROPRIETARY INFORMATION** **This technical data contains (fill in non-Sandia Co. name) Proprietary Information furnished under contract or agreement *(number XXXX -- include number if applicable)* between Sandia National Laboratories and *(fill in non-Sandia Co. name)* for the controlled release of the information. Disclosure outside the Government is not authorized without prior approval of the originator, or in accordance with provisions of 48 CFR 952.227 and 5 U.S.C. 552.** **Further dissemination authorized to U.S. Government agencies only; other requests shall be approved by the originating facility or higher DOE programmatic authority.** **OFFICIAL USE ONLY**

Name of Notice	Instructions	Sample
Protected Battery Information http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover template: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	**Include all OUO markings (refer to A.2)** Cover/title page – top block under SAND No. Cover only Add dissemination statement on cover and title pages. *Note: The abstract should not include Protected Battery Information.* Mark top and bottom of each page.	OUO Exemption 3, Statutory Exemption **Official Use Only/Protected Battery Information** **PROTECTED BATTERY INFORMATION** **This product contains Protected Battery Information that was produced under Contract/CRADA No. _____ and is not to be further disclosed for a period of up to five years after the completion of the individual project, or not prior to *(date)*.** **Further dissemination authorized to the Department of Energy only; other requests shall be approved by the originating facility or higher DOE programmatic authority.** **OFFICIAL USE ONLY**

Name of Notice	Instructions	Sample
Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434 Cover template: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	**Include all OUO markings (refer to A.2)** Cover/title page/back cover top and bottom; top block under SAND No. Add dissemination statement on cover and title pages. Mark top and bottom of each page.	OUO Exemption 3, Statutory Exemption **OFFICIAL USE ONLY / SBIR PROPRIETARY INFORMATION** OR **OFFICIAL USE ONLY / SMALL BUSINESS TECHNOLOGY TRANSFER** **Further dissemination authorized to U.S. Government agencies only; other requests shall be approved by the originating facility or higher DOE programmatic authority.** **OFFICIAL USE ONLY**

Third Party Proprietary	**Include all OUO markings (refer to A.2)** Cover/title page/back cover top and bottom; top block under SAND No. Add dissemination statement on cover and title pages. Mark top and bottom of each page.	OUO Exemption 4, Commercial Proprietary Official Use Only/Third Party Proprietary Information This technical data contains (fill in non-Sandia Co. name) Proprietary Information furnished under contract or agreement (number XXX) between Sandia National Laboratories and (fill in non-Sandia company name) for the controlled release of the information. Disclosure outside the Government is not allowed without prior approval of the originator, or in accordance with provisions 48 CFR 952.227 and U.S.C. 552. Further dissemination authorized to U.S. Government agencies only; other requests shall be approved by the originating facility or higher DOE programmatic authority. **OFFICIAL USE ONLY**

A.4. Classified Documents

Classified documents have levels of classification: TOP SECRET (TS), SECRET (S), or CONFIDENTIAL (C). They also have categories: RD, FRD, or NSI. They can also have caveats or access restrictions such as NWD, Sigma numbers, CNWDI, and NOFORN. These levels, categories, and access restrictions may be used in various combinations. Detailed guidance on handling classified documents, as well as cover sheets and envelopes, can be found in the reference publications:

S&S Marking Guide

https://wfsprod01.sandia.gov/groups/srn-uscitizens/documents/document/wfs521514.pdf

CMPC

http://sns.sandia.gov/program/cmpc/

CPR 400.3.12. "Management of Classified Matter"

http://www-irn.sandia.gov/iss/CPR400.3.12/cpr400.3.12.htm

DOE Marking Handbook (September 2006):
http://www-irn.sandia.gov/security/dept/classification/doemarkinghb2006.swf

The classified checklist in Appendix B includes some other requirements for classified reports.

A.4.1 Levels

All classified documents must be marked with the classification level.

Name of Notice	Instructions	Sample
Top Secret Covers: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	Place at top and bottom on front of each page in bold letters at least one eighth-inch high. RD and FRD internal pages (including title page) are marked with **level and category**. The back of the last page is marked top and bottom with level and category. Cover and title page: If you have a Top Secret document, contact Classification Dept. (NM) or Communication Arts Dept. 8528 (CA) for marking requirements.	**TOP SECRET** For Distributions to locations outside the DOE Complex, the following is included on the title page and cover: **Dissemination and Reproduction Limitation – No further reproduction and/or dissemination of this document is permitted without the consent of the originator. *** *Exact wording may vary depending on classification circumstances. Contact Classification Department.

Name of Notice	Instructions	Sample
Secret Covers: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	Place at the top and bottom on front of each page in bold letters at least one-eighth-inch high. RD and FRD internal pages (including title page) are marked with **level and category**. The back of the last page is marked top and bottom with level and category. Cover and title page:	**SECRET** For Distributions to locations outside the DOE Complex, the following is included on the title page and cover: **Dissemination and Reproduction Limitation – No further reproduction and/or dissemination of this document is permitted without the consent of the originator.*** *Exact wording may vary depending on classification circumstances. Contact Classification Department.

Name of Notice	Instructions	Sample
Confidential Covers: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	Place at the top and bottom on front of each page in bold letters at least one-eighth-inch high. RD and FRD internal pages (including title page) are marked with **level and category**. The back of the last page is marked top and bottom with level and category. Cover and title page:	**CONFIDENTIAL** For distributions to locations outside the DOE Complex: **Dissemination and Reproduction Limitation – No further reproduction and/or dissemination of this document is permitted without the consent of the originator.*** *Exact wording may vary depending on classification circumstances. Contact Classification Department.

A.4.2 Categories

In addition, various categories are required.

Name of Notice	Instructions	Sample
Restricted Data (RD) Covers: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	Cover/title page – top block under SAND No. Place on title page and cover, lower right corner. Level only on cover. Internal pages (including title page) carry **level and category**. Back of last page marked top and bottom with level and category.	**Restricted Data** **RESTRICTED DATA** **This document contains Restricted Data as defined in the Atomic Energy Act of 1954. Unauthorized disclosure subject to Administrative and Criminal Sanctions.** Note: Be sure to add the dissemination and reproduction statement associated with the level (Section A.4.1). **RD Example:** **Classified By: Name of Derivative Classifier, and Title, and Organization** **Derived From: Guidance, and Guidance Date, and Agency and where available Office of Origin** **Date Classified: (optional)** • On the Classified by line: DC's Name and Title • On the "Derived From" line: o For DOE-approved guidance, the short title, issuance date of the guide, and "DOE OC" (e.g., CG-SS-4, 9/2000, DOE OC) o For other-Agency guidance, the short title, issuance date of the guide, Agency, and where available, the office issuing the classification guidance (e.g., CG No. 1, 7/2005, Dept. of Good Works, Office of Administration) o If more than one guide was used to classify the document, enter "Multiple Sources" on this line and include a list identifying each guide with the record copy of the document.

Name of Notice	Instructions	Sample
Formerly Restricted Data (FRD) Covers: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	Cover/title page – top block under SAND No. Place on title page and cover, lower left corner. Level only on cover. Internal pages (including title page) carry **level and category**. Back of last page marked top and bottom with level and category.	**Formerly Restricted Data** **FORMERLY RESTRICTED DATA** **Unauthorized disclosure subject to Administrative and Criminal Sanctions. Handle as Restricted Data in Foreign Dissemination, Section 144.b, Atomic Energy Act of 1954.** Note: Be sure to add the dissemination and reproduction statement associated with the level. **FRD Example:** **Classified By: Name of Derivative Classifier, and Title, and Organization** **Derived From: Guidance, and Guidance Date, and Agency and where available Office of Origin** **Date Classified: (optional)** • On the Classified by line: DC's Name and Title • On the "Derived From" line: o For DOE-approved guidance, the short title, issuance date of the guide, and "DOE OC" (e.g., CG-SS-4, 9/2000, DOE OC) o For other-Agency guidance, the short title, issuance date of the guide, Agency, and where available, the office issuing the classification guidance (e.g., CG No. 1, 7/2005, Dept. of Good Works, Office of Administration) o If more than one guide was used to classify the document, enter "Multiple Sources" on this line and include a list identifying each guide with the record copy of the document.

Name of Notice	Instructions	Sample
National Security Information (NSI) Covers: http://www-irn.sandia.gov/corpdata/corpforms/formlst.htm#sand under SAND Report Covers	Cover/title page top block under SAND no. Cover page NSI documents dated after 4/1/97 are portion marked. Documents prior to that are portion marked when sent outside SNL.	**National Security Information** Place on lower left side: **DERIVATIVE DECLASSIFIER REVIEW** **REQUIRED PRIOR TO DECLASSIFICATION** **Classified By:** Name of Derivative Classifier,Title and Organization **Derived From:** Guidance, Guidance Date, Agency,and where available, Office of Origin **Declassify On:** Date, Event or Exemption and Date or Exemption and Event **Date Classified:** _____(optional)_____ **Note**: Be sure to add the dissemination and reproduction statement associated with the level (see A.3.1). National Security Information (NSI) documents: • Do not contain full category legend on the first page. • Do not contain category marking on interior pages. • Do not include category marking on back of last page and back sheet. • Do require caveat markings as applicable.

Name of Notice	Instructions	Sample
Naval Nuclear Propulsion Information	Refer to section A.2. May be classified or unclassified.	

A.5. Special Categories of Access

C/UC*	Marking	Instruction	
C	**Critical Nuclear Weapon Design Information (CNWDI)** CNWDI is a DoD marking designating Top Secret or S/RD.	Cover and title page, top block under SAND no. and NWD line When the document is to be (or may be) distributed to DoD, the above limitation should be placed under the NWD line. Cover and title page	**Critical Nuclear Weapon Design Information** **CRITICAL NUCLEAR WEAPON DESIGN INFORMATION** **DoD DIRECTIVE 5210.2 APPLIES**
C	**FURTHER DISSEMINATION ONLY AS AUTHORIZED BY (GOVERNMENT AGENCY)**	This notation applies to documents whose further dissemination within the receiving contractor facility is restricted to persons authorized by the addressee. Dissemination outside the facility is prohibited without the approval of the contracting activity.	

C/UC*	Marking	Instruction	
C	**Nuclear Weapon Data (NWD)**	Cover/title page – top block under SAND No. Note: A Sigma number must appear on all NWD reports. Cover and title page of Sigma 14 or 15: Cover and title page of Sigma 14 (not on Sigma 15); place above other legends: Check that all recipients are on the Sigma 14/15 access list maintained by Use Control Systems & Stockpile Support Dept. (NM) or International Security Dept. (CA). Applies to a minimum classification of Secret.	**Nuclear Weapon Data • Sigma ___** **SIGMA 14 (or 15) Sensitive Use Control Information Access Restricted** **This document may not be reproduced or disseminated beyond original distribution without approval of the originator, originating agency's Use Control Site Coordinator, or the NNSA HQ Use Control Site Coordinator.**
C	**REPRODUCTION REQUIRES APPROVAL OF ORIGINATOR**	This notation applies to documents that may not be reproduced without the specific, written approval of the originator.	

C/UC*	Marking	Instruction	
C/UCI	**PROGRAM DESIGNATED SPECIAL HANDLING** The Sandia Program manager must receive permission to use PDSH from the DOE Program Manager prior to publishing the document (DC Handbook). Requester must provide a letter of justification addressed to DOE OSTI from the agency or the Sandia/DOE Project Office that requires the distribution to be limited. The Technical Library will hold a copy of the letter for future inquiries or requests.	Cover/title page – top block under SAND No. (for UCI) Cover and title page Distribution list begins:	**Official Use Only / (Exemption Name) / Program Designated Special Handling** **OFFICIAL USE ONLY / PROGRAM DESIGNATED SPECIAL HANDLING** **In accordance with Program requirements, originating facility or DOE approval is required prior to further distribution.** **PROGRAM DESIGNATED SPECIAL HANDLING:**
C	**Foreign Government Information (FGI)** http://www-irn.sandia.gov/security/dept/classification/ucicfigi.htm	This notice is used on documents to ensure that information of foreign origin is not declassified prematurely or made accessible to nationals of a third country without the consent of the originator. This information is handled as if classified and Confidential, but with modified handling and protection requirements. For Confidential use C/FGI-Mod cover sheet.	
U	**Internal Distribution Only (IDO)**	IDO is used for drafts and materials not going outside Sandia, or for corporate records. Insert Internal Distribution Only before the distribution list and on the top line of the cover and title page. IDO documents do not receive a SAND number.	
	NOFORN	Authorized only for intelligence information by authority of Director of Central Intelligence Information. May be used for NNPI.	

C/UC*	Marking	Instruction
U	**SAFEGUARDS INFORMATION (SGI)** Refer to: http://www-irn.sandia.gov/policy/infrastructure/cpr400220_40.htm#2434	This sensitive but unclassified information pertains to the Nuclear Regulatory Commission. Mark pages containing SGI or all pages at the top and bottom with SAFEGUARDS INFORMATION If the document has multiple pages, the page marking must be placed at the top and bottom of: ▪ the outside of the front and back covers, if any ▪ the title page, if any ▪ the first page of the text, if there is no front cover or title page ▪ the outside of the back page, if there is no back cover NRC Form 461 is a cover sheet for SGI with marking instructions. Add "Violation of protection requirements for Safeguards Information subject to civil and criminal penalties." to the cover in the lower left corner. Mark front and back covers with the name, signature, title, and organization of the individual authorized to make an SGI determination and who has determined that the document contains SGI, and the date of the SGI determination in the lower right corner. A double-sided cover sheet (NRC Form 961) is required.

* Classified/Unclassified.

APPENDIX B: CHECKLISTS

B.1 Unclassified Checklist

Cover

Is all information on the cover correct? Cover should be included in the file or included separately.

A page number does not appear on page 1 (front cover).

Check that the following cover items agree with the title page:

Report number(s)

Release information and print data

Report title

Author(s), full first name, middle initial or name spelled out (preferred), and last name of each; check spelling carefully.

Legends – Does cover include all legends as indicated on R&A form?

Does cover have Funding Statement?

Legal Notice (Disclaimer)

Does legal notice appear on page 2?

Title Page

Does the title page have the following information?

Report number

Distribution limitation (Unlimited Release, Patent Caution, or other statement as indicated on R&A form)

Print date (month and year without comma)

Full title of report

Author(s), full first name, middle initial or name spelled out (preferred), and last name of each (including non-Sandians); check spelling carefully. Spelling out middle names is encouraged.

Name of author(s)' organization(s), but not the organization number(s)

Company name and address, including ZIP code (87185-#### for Sandia/NM). Insert author's Mail Stop in ZIP.

The title page is numbered page 3.

Body of Report

Is page numbering correct? Check for the following:

- Page numbers in proper location
- No skips in sequence

Are the title page and the first page of body of report (the page with Introduction, Background, or similar headings) right-hand pages?

Do Contents listings (including figures and tables) agree with the text, and are page numbers listed correctly?

Are graphics of good, reproducible quality? Have you received permission to use copyrighted material (including web photos)?

Distribution

Are names, organizations, and mail stops up to date?

Are housekeeping copies correct?

List one electronic copy to be sent to the Technical Library on the distribution.

WFO Distribution list: Authors should include a Distribution list with their Work for Others report that contains at least the "housekeeping" copies.

R&A

Your R&A is not complete until the R&A Desk dates the sign-off. Have you made the changes required by the R&A Desk?

REVISIONS	REPRINTS
The word *Revised* appears after SAND# on cover and title page *unless* a new SAND# is used. The supersession statement, with a blank line above it, appears below the Printed (date) line on cover and title page. The statement reads the same whether it is for SANDxxxx-xxxx Revised or a new SAND#. It is: "Supersedes SANDxxxx-xxxx dated (month & year)."	On cover, the reprint date replaces the previous print date. On title page, *the previous print date is retained* and the reprint date is added below it. On distribution page, the original distribution is retained, followed by a blank line or two, then "Second (etc.) Printing, (date):" which is followed by another blank line and the new distribution. No housekeeping copies required unless there is a limitation or classification change.

B.2 Classified Checklist

Ref: http://www-irn.sandia.gov/iss/CPR400.3.12.1/cpr400.3.12.1.htm

Cover

Is all the information on the cover correct?

Is the "Classified by" box complete?

Is the cover numbered page 1?

Check that the following cover items agree with the title page:

Report number(s)

Nuclear Weapon Data & Sigma # or other limitations

Print date

Report title with classification in parentheses

Author(s), preferably first name, middle initial or name spelled out (preferred), and last name of each; check spelling carefully

Legends

Does cover include additional legends indicated on R&A form?

Does cover have "Prepared by . . ." statement?

Legal Notice (Disclaimer)

Does legal notice appear on page number 2?

Title Page

Does the title page have the following information?

Report number

Limitation statement(s) as marked on the R&A form (such as Nuclear Weapon Data – Sigma)

Print date (month and year without comma)

Full title of report followed by classification [e.g., (U) or (SRD)]

Author(s), preferably first name, middle initial or name spelled out (preferred), and last name of each; check spelling carefully

Name of author(s)' organization(s), but not the organization number(s)

Company name and address, including ZIP code (87185-#### for Sandia/NM)

Does classification [e.g., (U) or (SRD)] follow the word *Abstract*?

Are all classification markings and legends included?

Body of Report

Is page numbering correct? Check for the following:

- Page numbers in proper location
- No skips in sequence
- If Secret or Confidential, no double page numbers, and all blank pages state *Intentionally Left Blank*
- Is the last page of report (which should be a blank left-hand page) numbered and does it say *Intentionally Left Blank*?
- Has the back of the last page been marked properly, if required?

Are the title page and the pages with the Introduction, Contents, Executive Summary, and similar headings right-hand pages?

Do Contents listings (including figures and tables) agree with the text, and are page numbers listed correctly?

Does the report require portion marking?

Are graphics of good, reproducible quality? Have you received permission to use copyrighted material (including Web photos)?

Are classified references properly marked (Section 6.3)?

Distribution

Are names, organizations, and classified mail stations current? These must be verified.

Do all external recipients have a current classified mail channel?

Are external recipients listed by increasing mail channel numbers?

List one electronic copy and one hardcopy to be sent to the Technical Library and one hard copy to go to Central Technical Files.

Is the Distribution page numbered?

R&A

Does Review & Approval (R&A) Form include all approvals?

REVISIONS	REPRINTS
The word *Revised* appears after SAND# on cover and title page *unless* a new SAND# is used. The supersession statement, with a blank line above it, appears below the Printed (date) line on cover and title page. The statement reads the same whether it is for SANDxxxx-xxxx Revised or a new SAND#: "Supersedes SANDxxxx-xxxx dated (month & year)"	On cover, the reprint date replaces the previous print date. On title page, *the previous print date is retained* and the reprint date is added below it. On Distribution page, the original distribution is retained, followed by a blank line or two, then "Second (etc.) Printing, (date):" which is followed by another blank line and the new distribution. No housekeeping copies required unless there is a limitation or classification change.

Classified documents require the following:

Page Numbers
Subject/Title Marking
Abstract Marking
Classification Level
Classification Category
Classifier Information
Sigmas (if applicable)
Caveats (if applicable)
Portion Markings (NSI only)

:

APPENDIX C: SAND REPORT SAMPLE

The following sample was excerpted from an actual report and modified to present all sections that might appear. The boxes at the bottom of each page contain brief writing instructions about what to include in each section.

Modifiable SAND Report samples are available on the Sandia Creative Group web site at:

Creative Arts Resources

SANDIA REPORT

SAND2002-####
Unlimited Release
Printed August 2002

The Velocity Interferometer System for Any Reflector

Mod B, Push-Pull with Double-Delay-Leg and Dual VISAR Modes

Oren B. Crump, Jr., Paul L. Stanton

Prepared by
Sandia National Laboratories
Albuquerque, New Mexico 87185 and Livermore, California 94550

Sandia is a multiprogram laboratory operated by Sandia Corporation,
a Lockheed Martin Company, for the United States Department of Energy's
National Nuclear Security Administration under Contract DE-AC04-94AL85000.

Approved for public release; further dissemination unlimited.

Sandia National Laboratories

Legal Notice (disclaimer) on inside front cover of report.

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Available to DOE and DOE contractors from
U.S. Department of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

Telephone: (865)576-8401
Facsimile: (865)576-5728
E-Mail: reports@adonis.osti.gov
Online ordering: http://www.doe.gov/bridge

Available to the public from
U.S. Department of Commerce
National Technical Information Service
5285 Port Royal Rd
Springfield, VA 22161

Telephone: (800)553-6847
Facsimile: (703)605-6900
E-Mail: orders@ntis.fedworld.gov
Online order: http://www.ntis.gov/ordering.htm

A report with a Distribution Limitation would say that at the top and bottom of the page in at least 1/8 inch bold type

SAND 2002 - ####
Unlimited Release
Printed August 2002

SAND Numbers are assigned at the end of Review and Approval

The Velocity Interferometer System for Any Reflector

Mod B, the Push-Pull With Double-Delay-Leg and Dual VISAR Modes

Include organization name, but not number

Oren B. Crump, Jr., and Paul L. Stanton
Explosive Projects and Diagnostics Division
Sandia National Laboratories
P. O. Box 5800
Albuquerque, NM 87185-1914

See Figure 5-7 for multiple authors

Main author's mail stop

Abstract

The Velocity Interferometer System for Any Reflector (VISAR) is the modern standard for measurement of shock phenomena. This report describes the original VISAR and its evolution into the current Mod B version built for Sandia's Explosive Projects and Diagnostics Division 2514. The Mod B system incorporates the push-pull signal processing introduced in Mod A to reduce sensitivity to target self-light and simplify data reduction, and it introduces the use of two push-pull VISARs to obtain two modes of operation. In the Dual VISAR mode, each VISAR is used independently to track separate targets or separate points on a common target. In the Double-Delay-Leg mode, both delay legs are used to track the motion of a single point.

Abstract:

- Sandia requires that all SAND Reports contain an abstract on the title page. Exceptions are rare.
- In a classified report, keep the abstract unclassified whenever possible.
- Use "key" words to support library searches (information retrieval).
- The purpose of an abstract is to explain the essence of your report to the reader.
- The abstract should be kept short
- It helps to have other people review your abstract.

Abstracts are of two types: *informative* and *descriptive*. The informative abstract is preferred.

Continued in bottom box on next page . . .

3

Acknowledgment

The authors thank R. E. Hollenbach of the Thermomechanical and Physical Division for the very helpful conversation regarding his earlier work with circuit designs for photomultiplier tubes.

Acknowledgment:

Often an acknowledgment is the only recognition given someone who has made an important technological contribution to your work. For this reason it is an important part of the report. Give the contributor's name and tell briefly what the contribution was: "John Doe for his skill in fabricating the special testing equipment." Sandia's policy on acknowledgments was outlined by R. S. Claassen, 8000, in his memo "Publications–Title and Acknowledgments," December 18, 1984:

> Acknowledgment of work by others, when appropriate, is an obligation of the author of a Sandia report or a journal paper. It is not necessary, however, to acknowledge work which was performed as a normal part of a work assignment. The important acknowledgment is for professional level contributions. Conceptual level inputs, such as innovative thoughts or original suggestions for an approach to the problem, rank first. Considerable effort at an advanced level, such as analysis of experimental data or refinement of experimental techniques, deserves credit. Recognition should be given to an assistant who has contributed to the work through skill and careful experimentation. Acknowledgments should be stated in a simple, declarative way. Flowery language and admissions of indentured servitude are inappropriate.

Abstract (continued from title page):

Informative abstract. In an informative abstract, you should—

- Explain the most important points of the report to give the reader a clear overview of the research, experiment, test, or other activity being reported. The well-written informative abstract may contain all the information certain readers need; other readers may find they want to explore the entire report.
- State the study's purpose, its objectives, or the subject treated. Classify the scope of your treatment as preliminary, brief, comprehensive or exhaustive, experimental, theoretical, or some other appropriate term.
- State the method of attack, parameters, and equipment involved, especially if they are new or unique.
- Report results (both expected and unexpected), their degree of accuracy, and their significance.
- Note if related or follow-up work is needed or planned.
- Insert no illustrations, charts, tables, references, or footnotes; refer to no specific figures or paragraphs.
- Write in full sentences, in the active voice whenever possible.

Descriptive abstract. In a descriptive abstract you outline the organization of your report but do not explain its major ideas. (It is essentially an extended table of contents and is best used for a manual, tutorial, or other reference material.)

4

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These sections of the published report are omitted because they serve no illustrative purpose.

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2 Push-Pull VISAR .....
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6 Frequency Response for Photomultiplier Circuit From Test Setup of Figure 5 .....
7 Response of Photomultiplier to a Narrow Optical-Plus Input .....

(Continue listing all figures in the report)

These figures were omitted because they serve no illustrative purpose.

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This report does not have tables. If you have tables, list them here, using the format for figures.

Contents page:

- Include a Contents page if the report is longer than 15 pages; if the report is shorter, a Contents page is not required, although you may choose to include one.
- List major headings. Also include level two and three headings if necessary. Headings are the major road signs for the reader, so include the levels that serve the reader. List the headings exactly as they appear in the text (but omit parenthetical material).
- Include a list of figures and a list of tables unless you have fewer than three figures or three tables.

5

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This report does not contain a preface.
If you have a preface or a foreword, place it here.

Preface and Foreword:

Most SAND Reports do not require a preface or a foreword. However, if you want to give the reader background information that is not appropriate to include in the text, or if someone else wants to write a prefacing statement, place it here.

The foreword is usually a prefacing statement made by someone other than the author. (Always check the spelling of Foreword; it is not "Forward," one of the more common oversights in writing.)

Sometimes acknowledging statements are included in the preface, making a separate acknowledgment section unnecessary.

6

Summary

This report does not contain an executive summary.
If you have a summary, place it here.

Executive summary:

- An executive summary is a complete but concise recapitulation of the major points of the entire report. The summary may provide some readers with all the information they need; it will brief others so that they will have a basic concept of the subject before they start reading the report.
- Often, especially in short reports, the abstract contains enough information to eliminate the need for an executive summary (as is the case in this report).
- The length varies according to the content and the audience. If you keep in mind the function of your summary—to briefly recapitulate the major points of the report—the length should be self-determining.
- Steps in developing a summary—
  1. Review your report and note major points, significant facts, important considerations, and major conclusions.
  2. List key phrases or sentences you want to include.
  3. Compress information from steps 1 and 2, and coherently connect the ideas.
  4. Have other people review your summary for accuracy, completeness, and proper emphasis.

7

Nomenclature

BS	beam splitter
PBSC	polarizing beam-splitting cube
PMT	photomultiplier
PZT	piezoelectric translator
VISAR	Velocity Interferometer System for Any Reflector
c	velocity of light
C	total of light velocity
H	total thickness of elements
d	correction for refractive index with window
Dm/n	a correction term required when a window material with a stress-dependent refractive index is used

Group terms according to functions and leave a space between the groups.

Acronyms, initialisms, and special terms:

When your report contains many acronyms, initialisms, or special terms, list them in a special section. Give the sections an appropriate title: nomenclature, acronyms, special terms, or other appropriate words.

Treatment of items in the listing:

- Capitalize the expanded terms as you would in text; use capitals only when they are required by the standard rules of grammar — NOT to indicate which letters make up the acronym.
- Group terms in the following order, with a blank line between the groups: acronyms, abbreviations, and general terms; mathematical English letters or terms; and mathematical Greek terms.
- When a letter in the listing appears as both capital and lower case, list the lower case terms first.
- The generic title "nomenclature" includes acronyms and initialisms, symbols, and special terms.

Treatment of items in the text:

- At first use in text, enter the phrase as it usually appears (this is the "expanded" term) followed by the abbreviated form in parentheses. In a long report, you may want to refresh the reader's memory in a later section by showing both the acronym and its expansion.
- For an isolated use of the phrase much later in the text, simply use the expanded term.

Pluralizing abbreviations:
Add "s" as in PMTs. Use the apostrophe only when not doing so might cause confusion, as in K_d's.

Using the correct indefinite article:
The choice of an indefinite article (*a* or *an*) is based on pronunciation—"*a*" before consonant sounds and long "u" sounds; "*an*" before vowel sounds. Examples: an ICBM, a FROG, an FFT, a FORTRAN program, an ADNET.

8

Introduction

The modern standard for measuring shock phenomena is the Velocity Interferometer System for Any Reflector (VISAR).[1] The VISAR uses coherent, single-frequency light from a laser source to measure the motion of a diffuse, reflective surface. The Doppler shift in the reflected light is detected in a modified Michelson interferometer. The inherent sensitivity, resolution, and frequency response of such a system are essentially limited only by the bandwidth of the optical detectors and recording equipment.

This report describes the development and operation of the VISAR Mod B Push-Pull with Double-Delay-Leg and Dual VISAR modes.

Background

The VISAR development started with the conventional version originated by L. M. Barker and R. E. Hollenbach of Division 1534 and progressed through the Push-Pull VISAR modification (Mod A) made by W. F. Hemsing of Los Alamos National Laboratories.[1,2] The early 1970s experiments of J. E. Kennedy of Division 5131 and the author first used the double- delay-leg technique incorporated in the current Mod B.[3] Each version resulted from a new need. To establish a background for understanding the current version, each of the earlier versions is discussed.

Introduction:

The function of an introduction is to inform the reader of the following:

- The exact *subject* of the report. Try to present a key idea in the first sentence or two.
- The exact *purpose*—why the report is being written; why the work is important.
- The *scope* — the "range" of the subject matter, that is, the detail in which it is discussed (and sometimes in what detail it is not discussed). The scope may require a section of its own.
- The *plan of development*—how you have organized your report. This information should appear near the end of your introduction. (This does not mean that you name each section. Rather it means that you explain the order in which you develop the report; be careful that your explanation is given in the same sequence in which you present the development in the text.)
- Identity of audience to whom you are directing the report and how the information will be used by this audience.
- A brief explanation of any outside sources you are using.
- Background information the readers need to understand the report better. The background sometimes may be long enough and important enough to require a section of its own, as in this example report.

The *length* of your introduction is determined by what is needed to set the stage for your readers to readily get a clear concept of your objective. It may be only a few sentences or it may be quite long; include only what is necessary.

9

The Conventional (Original) VISAR

The conventional VISAR was developed by Barker and Hollenbach primarily to measure free-surface velocities of materials in gun-impact experiments.[1] In this type of experiment, projectile velocities are very accurately measured (by other means), and well-defined experiments can be performed with results that are predictable in many respects. Uncertainties in the number of missed fringes at a shock jump may be resolved by using the known impact velocity and the impedances of the impactor and target materials.

The features of a conventional VISAR are shown in Figure 1. A diffused beam containing the target Doppler information is returned to the VISAR table, passing through a telescope to reduce the beam diameter. A small part of the light beam is split off to an intensity monitor, and the remainder is routed to the main beam splitter of the interferometer. Half of the signal is sent through a reference leg and half through the delay leg, whose medium is air and fused silica.

This beam is delayed by a time, t, caused by the difference in the index of refraction of the fused silica in the delay leg and the air in the reference leg. The beams are reflected and recombined at the main beam splitter, where interference is developed. A phase shift is produced in the recombined beam by a change in the target velocity. When the beam recombines, half of the recombined beam propagates in two directions away from the beam splitter, and interference phase information is present in each beam. One of the recombined beams is routed to the photo detectors, while the other beam is wasted. A polarizing beam-splitting cube splits the beam into two quadrature components: S and P polarized light beams.

Developing the text:

Decide before your first draft what your primary order of development will be. Making this decision at the very beginning will help you write a closely knit report. Here are suggested methods for organizing particular types of material.

Method	Appropriate Use
Sequential	to write a set of instructions or procedures.
Chronological	to emphasize the time element.
Comparison	to write about a new topic that is similar to others (as in this report).
Division and classificationto describe a device that can be broken into its component parts.	
Spatial	to describe the physical appearance of a device, going from top to bottom, outside to inside, and so on.
General to specific	to write about, say, a software program, starting with the general function of the program, going to the larger routines and their functions, then the smaller routines and their functions.
Specific to general	to do the reverse of the previous method.
Decreasing order of importance	follows the same logic as general to specific.
Increasing order of importance	follows the same logic as specific to general.

Different methods in the same report:
Remember that different sections may require different types of development. For example, background may be chronological, and product description may be spatial. Use the same method for similar topics.

10

Figure 1. The Original VISAR Model (L. M. Barker and R. E. Hollenbach, Laser Interferometer for Measuring High Velocities of Any Reflecting Surface in J Appl Phys, Vol 43, No. 11, Nov 1972.).

Graphics, headings, and reference citations:

Because these topics occur throughout your report, they are combined here for convenience.

Figures and tables (graphics):

- Relate your graphics clearly to the text. Use consistent terminology in both. Use graphics only to serve a specific purpose—not as fillers.
- Use concise figure captions and table titles that clearly describe the content.
- *Do not use duplicate captions or titles.* If a figure or table is not different enough to deserve a different caption or title, maybe you do not need to include it.
- Call out all figures and tables in the text, and call them out sequentially.
- If a figure is taken from a published non-Sandia source, obtain written permission from the previous publisher. Then cite that source in your graphics caption, or above the caption, so that the original source will "travel" with the graphic if someone else decides to use your version of it. Use words such as "Reproduced with permission from (*and give the source information, including* the *publisher).*" See pages 102 and 221-224.

Headings:

- Use headings to flag the logical divisions of your text so the reader can (a) easily understand your method of developing the material and (b) locate a subject quickly.
- Make headings descriptive, brief, and parallel in structure.

Reference citations:

- Cite references by sequential numbering or the author-date system. Sequential-number citations should either be superscript numbers or on the line and bracketed: . . . was reliable.[2]; . . . was reliable [2]. Author-date citations should appear in parentheses on the line in the following form: (Smith 1992), (Jones et al. 1991), (Smith 1992, Kirkpatrick 1986a and 1986b). Kirkpatrick had two publications in one year, so to distinguish the citations they are labeled "a" and "b" and are listed that way in the reference list.
- If a superscript citation could be misinterpreted as a mathematical exponent, as in "a total of 36 ft^2," write "a total of 36 ft (Reference 2)" or "a total of 36 ft (Ref. 2)." If the reference itself forms part of the sentence, write (for example) "Reference 3 contains diagrams of the unit."

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The target velocity information is contained in the phase-time history of each of the S and P polarized light beams. These beams are monitored by photomultiplier tubes (PMTs). The P polarized light is Data 1, and the S polarized light is Data 2. The recorded output of the PMTs is used to determine the target velocity, which is related to the instantaneous phase, ϕ, by the equation

$$u(t-\tau/2)=\frac{\lambda\phi(t)}{2\tau(1+\Delta v/v)}\frac{1}{1+\delta}$$

where

τ = delay time in the interferometer

λ = the source wavelength

$\Delta v/v$ = a correction term required when a window material with a stress-dependent refractive index is used

δ = a correction for refractive index with wavelength[4]

The amplitude (envelope) of the phase information may change during an experiment because the target surface conditions may be altered by the shock wave. Thus, in conventional VISAR, measurement of instantaneous phase involves comparison of each data signal with the instantaneous overall amplitude or intensity.

Equation (1) may be solved for the velocity per fringe (VPF):

$$VPF=\frac{u(t-\tau/2)}{\phi(t)}=\frac{\lambda}{2\tau(1+\Delta v/v)}\frac{1}{1+\delta}$$

Equations and mathematical English:

- If you hand write your equations in the draft, use ink and form the characters carefully, especially Greek and other mathematical symbols. Circle any confusing term at first use and write in the margin what it is. Examples are ρ and p (rho and pee); η and n (eta and en); δ and ∂ (delta and partial derivative); χ and x (chi and ex). Write superscripts and subscripts so that the typist or others can easily distinguish them.
- Write any special instructions to the typist on a cover sheet or at the appropriate place in the draft. If you have a strong preference as to where the equations are to be broken at line endings, write instructions. Examples: after equals sign, before operators, no breaks immediately before dx, and so on. Because redoing equations is very time-consuming, any guidance you can give in your draft to help the typist get it right the first time is well worth the effort. The typist is not a mathematician and so must rely solely on the clarity of your draft.
- Punctuation of equations is a personal choice. The smoothest style is to punctuate them according to their function in the sentence. However, some authors prefer to use no punctuation (referred to as "open" style). Indicate your preference at the beginning of your draft, or at the beginning of the equations, so the typist will be certain about the style. Be consistent, whatever your choice. Indented paragraphs in a document with lots of equations allow you to distinguish when an equation occurs in the middle of a paragraph (no indent there).

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Conclusion

The Mod B Push-Pull VISAR with Double-Delay-Leg or Dual VISAR mode has proved to be a very useful tool in our diagnostic lab. With the 400-MHz data-recording capabilities, we have been able to characterize numerous flying foil configurations using both the Dual VISAR and Double-Delay-Leg modes without missing fringes caused by frequency response limitations. We have also been able to obtain very reproducible data from similar experiments.

Closure:

- End your report with a summary, a statement of the value of the report, a recommendation, or whatever concluding remarks are appropriate.
- Make some significant point, an indication of possible future use, or some other remarks that keep the readers from feeling they have simply been dropped.
- The current trend is to place the summary at the front of the report, where a busy person can quickly get a "thumbnail" concept. If your summary has been placed at the front of the report, use some other concluding paragraph to tie off the report.

13

References

[1]L. M. Barker and R. E. Hollenback, Laser Interferometer for Measuring High Velocities of Any Reflecting Surface, *J. Appl. Phys.*, vol 43, no. 11, Nov. 1972.

[2]W. F. Hemsing, Velocity Sensing Interferometer (VISAR) Modification, *Rev. Sci, Instrum.*, vol 50, no. 1, Jan. 1979.

[3]J. E. Kennedy, Org. 5131, Sandia National Laboratories, private communication.

[4]J. R. Asay, Shock and Release Behavior in Porous 1100 Aluminum, *J. Appl. Phys.*, vol 46, no. 1, Jan. 1975).

[5]J. E. Kennedy and O. B. Crump, Jr., SNL, unpublished results.

[6]R. W. Barnard, DATACO - Digitizer Control and Data Acquisition Program, SAND87-2029. Sandia National Laboratories, in process, Albuquerque.

References:

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(Place Title Here)

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If you have an appendix, place it after the References.

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Use an appendix to include material that supplements the report but is not appropriate to include in the report. The report itself should not suffer if the appendix is removed. Examples of supplemental material appropriate for an appendix are equations, related correspondence, and related tests or experiments.

Note: Give credit to the person who authored an appendix if that person is not one of the authors of the main report.

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- Call out each appendix in the text, in alphabetical order. Examples are ". . . described in the Appendix"; ". . .described in Appendix A."
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