

AWARD/CONTRACT

OMB No. 1505-0080 Expiration Date: 03/31/92

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1. THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350) RATING

2. CONTRACT NO. NRC-02-91-007	3. EFFECTIVE DATE 1/29/91	4. REQUISITION/PROJECT NO. NMS-90-003
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5. ISSUED BY Code: U.S. Nuclear Regulatory Commission Div. of Contracts & Property Mgmt. Contract Neg. Br. No. 1; P-1020 Washington, DC 20555	6. ADMINISTERED BY Code: (If other than Item 5) U.S. Nuclear Regulatory Commission Div. of Contracts & Property Mgmt. Contract Administration Branch 1 Washington, DC 20555
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7. NAME AND ADDRESS OF CONTRACTOR
Colorado State University
Sponsored Programs
Ft. Collins, CO 80523

8. DELIVERY
() FOB ORIGIN
(X) OTHER (See below)

Code:
Facility Code:

9. DISCOUNT FOR PROMPT PAYMENT
N/A

10. SUBMIT INVOICES (4 copies unless otherwise specified) TO THE ADDRESS SHOWN IN ITEM: 6

11. SHIP TO/ MARK FOR CODE
U.S. Nuclear Regulatory Commission
Attn: Ted Johnson, MS 5E-4
NMS
Washington, D.C. 20310

12. PAYMENT WILL BE MADE BY CODE
Offer must be addressed as shown in
Item 7. Hand-carried offers
(Including Express Mail & delivery
services) must be delivered to

13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION
() 10 U.S.C. 2304(c) () (X) 41 U.S.C. 253(c) (1)

14. ACCOUNTING AND APPROPRIATION DATA
150-19-33-010 L1410-1 31X0200.150 \$100,000.00

15A. ITEM NO.	15B. SUPPLIES/ SERVICES	15C. QUANTITY	15D. UNIT	15E. UNIT PRICE	15F. AMOUNT
	Technical support services to provide methodologies for design of soil covers at waste disposal sites in accordance with NRC request dtd 10/15/90 and in accordance with CSU technical proposal dtd 11/13/90 which is incorporated herein by reference.				

15G. Total Est. Amount of Cost Reimbursement Contract \$330,157 (ceiling)

EXCEPTION TO STANDARD FORM SF26 (REV.4-85)

Prescribed by GSA
FAR(48 CFR) 53.214(a)

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CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE

17. (X) CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return 3 copies to issuing office.) Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents: (a) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications as are attached or incorporated by reference herein. (Attachments are listed herein.)

18. () AWARD (Contractor is not required to sign this document.) Your offer on Solicitation Number, including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents: (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

19A. NAME AND TITLE OF SIGNER (Type or print) James F. Brown Assistant V.P. for Research	20A. NAME OF CONTRACTING OFFICER Elois J. Wiggins
19B. NAME OF CONTRACTOR by <u>James F. Brown</u> (Signature of person authorized to sign) 1/30/91	20B. UNITED STATES OF AMERICA by <u>Elois J. Wiggins</u> (Signature of Contracting Officer)
19C. DATE SIGNED	20C. DATE SIGNED <u>1/29/91</u>

1. Section B, Article B.3 CONSIDERATION AND OBLIGATION--COST REIMBURSEMENT is amended as follows:

- a. "The total estimated cost to the Government for full performance under this contract is \$330,157."
- b. "The amount presently obligated with respect to this contract is \$100,000."
- c. "It is estimated that the amount currently allotted will cover performance through one year after contract award."

2. Section F, Article F.5 PLACE OF DELIVERY -- REPORTS is revised as follows:

"a" is amended to read, " Project Officer (3 copies)
U.S. Nuclear Regulatory Commission
Attn: Ted Johnson
Office of Nuclear Material Safety
and Safeguards
MS 5E-4 OWFN
Washington, D.C. 20555"

"b" is completed to read, "Contract Number: NRC-02-91-007"

3. Section F, Article F.6 DURATION OF CONTRACT PERIOD, is completed to read, "This contract shall commence on the effective date of contract award and will expire three years thereafter."

4. Section G, Article G.1 INDIRECT COST RATES is amended to include the following predetermined (fixed) rates:

Benefits - 19.3%
Indirect Cost - 45%

5. Paragraph a. of Article G.2 PROJECT OFFICER AUTHORITY is completed as follows:

"Name: Ted Johnson
Address: U.S. Nuclear Regulatory Commission
Office of Nuclear Material Safety
and Safeguards
MS 5E-4 OWFN
Washington, D.C. 20555"
Phone Number: 301-442-3440"

5. Section H, Article H-1. KEY PERSONNEL is amended to include the following individuals:

Dr. Steven R. Abt, Principal Investigator,
Dr. Pierre Y. Julien, Hydraulics Engineer
Dr. Charles D. Shackelford, Geotechnical Engineering Advisor
Dr. Thomas E. Brisbane, Laboratory Supervisor

6. Section I, I.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE is modified to correct the date on the following clause:

52.215-2 DEC 1989 AUDIT -- NEGOTIATION

7. Section I is modified to add the following clauses:

I.9 REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY-MODIFICATION (FAR 52.203-9) (NOV 1990)

(a) Definitions. The definitions set forth in FAR 3.104-4 are hereby incorporated in this clause.

(b) The Contractor agrees that it will execute the certification set forth in paragraph (c) of this clause when requested by the Contracting Officer in connection with the execution of any modification of this contract.

(c) Certification. As required in paragraph (b) of this clause, the officer or employee responsible for the modification proposal shall execute the following certification:

CERTIFICATE OF PROCUREMENT INTEGRITY--MODIFICATION (NOV 1990)

(1) I, _____ (Name of certifier) am the officer or employee responsible for the preparation of this modification proposal and hereby certify that, to the best of my knowledge and belief with the exception of any information described in this certification, I have no information concerning a violation or possible violation of subsection 27(a), (b), (d), or (f) of the Office of Federal Procurement Policy Act, as amended* (41 U.S.C. 423), (hereinafter referred to as "the Act"), as implemented in the FAR, occurring during the conduct of this procurement _____ (contract and modification number).

(2) As required by subsection 27(e)(1)(B) of the Act, I further certify that to the best of my knowledge and belief, each officer, employee, agent, representative, and consultant of [Name of Offeror] who has participated personally and substantially in the preparation or submission of this proposal has certified that he or she is familiar with, and will comply with, the requirements of subsection 27(a) of the Act, as implemented in the FAR, and will report immediately to me any information concerning a violation or possible violation of subsections 27(a), (b), (d), or (f) of the Act, as implemented in the FAR, pertaining to this procurement.

(3) Violations or possible violations: (Continue on plain bond paper if necessary and label Certificate of Procurement Integrity--Modification (Continuation Sheet), ENTER NONE IF NONE EXISTS)

(Signature of the officer or employee responsible for the modification proposal and date)

(Typed name of the officer or employee responsible for the modification proposal)

* Subsections 27(a),(b), and (d) are effective on December 1, 1990. Subsection 27(f) is effective on June 1, 1991.

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER TITLE 18, UNITED STATES CODE, SECTION 1001.

(End of certification)

(d) In making the certification in paragraph (2) of the certificate, the officer or employee of the competing Contractor responsible for the offer or bid, may rely upon a one-time certification from each individual required to submit a certification to the competing Contractor, supplemented by periodic training. These certifications shall be obtained at the earliest possible date after an individual required to certify begins employment or association with the contractor. If a contractor decides to rely on a certification executed prior to the suspension of section 27 (i.e. prior to December 1, 1989), the Contractor shall ensure that an individual so certified is notified that section 27 has been reinstated. These certifications shall be maintained by the Contractor for a period of 6 years from the date a certifying employee's employment with the company ends or, for an agency, representative, or consultant, 6 years from the date such individual ceases to act on behalf of the contractor.

(e) The certification required by paragraph (c) of this clause is a material representation of fact upon which reliance will be placed in executing this modification.

(END-OF-PROV)

I.11 PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY (FAR 52.203-10) (SEP 1990)

(a) The Government, at its election, may reduce the price of a fixed-price type contract or contract modification and the total cost and fee under a cost-type contract or contract modification by the amount of profit or fee determined as set forth in paragraph (b) of this clause if the head of the contracting activity or his or her designee determines that there was a violation of subsection 27(a) of the Office of Federal Procurement Policy Act, as amended (41 U.S.C. 423), as implemented in the FAR. In the case of a contract modification, the fee subject to reduction is the fee specified in the particular contract modification at the time of execution, except as provided in subparagraph (b)(5) of this clause.

(b) The price or fee reduction referred to in paragraph (a) of this clause shall be-

(1) For cost-plus-fixed-fee contracts, the amount of the fee specified in the contract at the time of award;

(2) For cost-plus-incentive-fee contracts, the target fee specified in the contract at the time of award, notwithstanding any minimum fee or "fee floor" specified in the contract.

(3) For cost-plus-award-fee contracts

(i) The base fee established in the contract at the time of contract award;

(ii) If no base fee is specified in the contract, 30 percent of the amount of each award fee otherwise payable to the Contractor for each award fee evaluation period or at each award fee determination point.

(4) For fixed-price-incentive contracts, the Government may-

(i) Reduce the contract target price and contract target profit both by an amount equal to the initial target profit specified in the contract at the time of contract award; or

(ii) If an immediate adjustment to the contract target price and contract target profit would have a significant adverse impact on the incentive price revision relationship under the contract, or adversely affect the contract financing provisions, the Contracting Officer may defer such adjustment until establishment of the total final price of the contract. The total final price established in accordance with the incentive price revision provisions of the contract shall be reduced by an amount equal to the initial target profit specified in the contract at the time of contract award and such reduced price shall be the total final contract price.

(5) For firm-fixed-price contracts or contract modifications, by 10 percent of the initial contract price; 10 percent of the contract modification price; or a profit amount determined by the Contracting Officer from records or documents in existence prior to the date of the contract award or modification.

(c) The Government may, at its election, reduce a prime contractor's price or fee in accordance with the procedures of paragraph (b) of this clause for violations of the Act by its subcontractors by an amount not to exceed the amount of profit or fee reflected in the subcontract at the time the subcontract was first definitively priced.

(d) In addition to the remedies in paragraphs (a) and (c) of this clause, the Government may terminate this contract for default. The rights and remedies of the Government specified herein are not exclusive, and are in addition to any other rights and remedies provided by law or under this contract.

(END-OF-CLAUSE)

8. Section K is amended to include Article K-22. REQUIREMENT FOR CERTIFICATE OF PROCUREMENT INTEGRITY (FAR 52.203-8) (NOV 1990) ALTERNATE I (SEP 1990)
9. Sections K, L, and M, are deleted for the purposes of this contract.
10. Nothing follows.

SOLICITATION, OFFER AND AWARD

1. This contract is a rated order under DPAS(15 CFR 350) RATING:

2. CONTRACT NO.	3. SOLICITATION NO. RS-NMS-90-003	4. TYPE OF SOLICITATION () SEALED BID (IFB) (X) NEGOTIATED (RFP)
5. DATE ISSUED	6. REQUISITION/PURCHASE REQ. NO. RS-NMS-90-003	
7. ISSUED BY CODE ATTN: RS-NMS-90-003 U.S. Nuclear Regulatory Commission Div. of Contracts & Property Mgmt. Contract Neg. Branch No. 1; P-1020 Washington, DC 20555	8. ADDRESS OFFER TO Offer must be addressed as shown in Item 7. Hand-carried offers (Including Express Mail and delivery services) must be delivered to the address in Item 9.	

NOTE: In sealed bid solicitations, "offer" is offeror" mean "bid" and "bidder".

SOLICITATION

9. Sealed offers for furnishing the services or supplies in the schedule are due at 3:30 PM, Washington, DC local time on _____. Offers sent through the U.S. Mail (including U.S. Postal Service Express Mail Next Day Service - Post Office to Addressee) must be addressed to the place specified in Item 7. All hand-carried offers including those made by private delivery services (e.g. Federal Express and Airborne Express) must be delivered to 7920 Norfolk Avenue, Bethesda, Maryland 20814 and received in the depository located in Room P-1011. NRC is a secure facility with perimeter access-control and NRC personnel are not available to receive hand-carried offers except during normal working hours, 7:30 AM - 4:15 PM, Monday through Friday, excluding federal holidays. Offerors should be aware that many private carriers only make deliveries to the mail room. All offerors should allow extra time for internal mail distribution.

Offerors should clearly identify the RFP number on the outside wrapper. IFB's should have affixed the Optional Form (OF) 17, "Sealed Bid Label," on the outside wrapper.

CAUTION - LATE SUBMISSIONS, MODIFICATIONS AND WITHDRAWALS. SEE SECTION L. PROVISION NO. 52.214-7 or 52.215-10.

All offers are subject to all terms and conditions contained in this solicitation. (See the Provision in Section L, "Proposal Presentation and Format").

10. FOR INFORMATION:	A. NAME: CALL: Susan Hopkins	B. TELEPHONE NO. (Include Area Code) (NO COLLECT CALLS) 301-492-4276
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OFFER (Must be fully completed by offeror)

NOTE: Item 12 does not apply if the solicitation includes the provision at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within _____ calendar days (60 calendar days unless a different period is inserted by the offeror) from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT (See Section I, Clause No. 52.232-8)
 10 CALENDAR DAYS _____% 20 CALENDAR DAYS _____% 30 CALENDAR DAYS _____% _____ CALENDAR DAYS _____%

14. ACKNOWLEDGEMENT OF AMENDMENTS (The offeror acknowledges receipt of amendments to the SOLICITATION for offerors and related documents numbered and dated:

AMENDMENT NO.	DATE	AMENDMENT NO.	DATE
---------------	------	---------------	------

15A. NAME AND ADDRESS OF OFFEROR	CODE : _____	FACILITY : _____	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER (Type or print)
----------------------------------	--------------	------------------	---

15B. TELEPHONE NO. (Include Area Code)	15C. CHECK IF REMITTANCE ADDRESS IS () DIFFERENT FROM ABOVE - ENTER SUCH ADDRESS IN SCHEDULE
--	---

17. SIGNATURE:	18. OFFER DATE:
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SOLICITATION, OFFER AND AWARD

AWARD (To be completed by Government)

19. ACCEPTED AS TO ITEMS NUMBERED 20. AMOUNT 21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION:

() 10 U.S.C. 2304(c)()

(X) 41 U.S.C. 253(c)(1)

23. SUBMIT INVOICES TO ADDRESS SHOWN IN ITEM

(4 copies unless otherwise specified)

24. ADMINISTERED BY CODE 25. PAYMENT WILL BE MADE BY CODE

(If other than Item 7)

U.S. Nuclear Regulatory Commission
Division of Accounting and Finance
GOV/COM Accounting Section
Washington, DC 20555

26. NAME OF CONTRACTING OFFICER (Type or Print) 27. UNITED STATES OF AMERICA 28. AWARD DATE

(Signature of Contracting Officer)

IMPORTANT - Award will be made on this Form or on Standard Form 26,
or by other authorized official written notice.

EXCEPTION TO STANDARD FORM 33 (REV. 4-85)

Prescribed by GSA
FAR(48 CFR) 53.214(c)

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OFFERORS/BIDDERS PLEASE NOTE:

An (*) means the information is to be incorporated into any resultant contract.

PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 PROJECT TITLE

The title of this project is as follows:

"Methodologies for Design of Soil Covers at Waste Disposal Sites"

(End of Clause)

B.2 BRIEF DESCRIPTION OF WORK (MAR 1987)

The objective of this contract is to provide information regarding the analysis and design of soil covers to ensure adequate protection against surface erosion at uranium mill and LLW sites. This contract will provide technical support on hydraulic and geomorphic design aspects for existing and future sites and detailed capability for overall systematic assessment of site licensing. Specific objectives of this contract include development of appropriate design and review procedures for quantitative prediction of erosion rates and long term stability

(End of Clause)

B.3 CONSIDERATION AND OBLIGATION--COST REIMBURSEMENT
(JUNE 1988) ALTERNATE I (JUNE 1988)

a. The total estimated cost to the Government for full performance under this contract is ____*____.

b. The amount presently obligated by the Government with respect to this contract is ____*____.

c. It is estimated that the amount currently allotted will cover performance through ____*____.

(End of Clause)

SECTION C - DESCRIPTION/SPECIFICATION
/WORK STATEMENT

C.1 STATEMENT OF WORK

A. BACKGROUND

Protection of public health and the environment from potential hazards of waste materials has required assessment of waste stabilization design procedures and methods. Current stabilization methods include construction of an earthen cap over wastes for long-term isolation. Reclamation standards and regulations, including 40 CFR Part 192, 10 CFR Part 40 Appendix A, and 10 CFR Part 61, require that protective measures be designed and constructed to insure low-maintenance stabilization for periods of 200 to 1000 years.

Erosion protection design components must protect waste covers and side slopes from overtopping flows caused by localized intense precipitation. Design criteria must be conservative enough to insure cover stability yet be economically feasible.

Reviews of soil cover designs have required the use of very conservative criteria based only on theoretical soil cover requirements or on empirical design criteria, generated in a previous long term stability investigation. Additional testing of soil covers is needed to verify that certain types of unprotected soil covers are viable alternatives to providing rock erosion protection.

B. OBJECTIVE

The objective of this contract is to provide information regarding the analysis and design of soil covers to ensure adequate protection against surface erosion at uranium mill and low-level waste sites. The Contractor shall provide technical support on hydraulic and geomorphic design aspects for existing and future sites and detailed capability for overall systematic assessment of site licensing.

C. SCOPE OF WORK

The Contractor shall perform the following tasks:

C.1.1 Task 1 - Utilizing available flumes and rainfall facilities, modified as necessary to conform with the needs of this project, the Contractor shall determine quantitative relationships for assessing gully formation and drainage basin development as a function of time. Using various soil types and slopes, the Contractor shall analyze maximum gully depths vs.

time, location of maximum gully depth, gully shape, and the effects of soil type on gully parameters.

C.1.1.A The Contractor shall conduct up to 10 tests using several different slopes and several different soil types. Slopes of 5% and 20% shall be tested using non-cohesive and cohesive soil types. Storms of varying magnitude shall be used to assess and predict the performance of gullies for a period of 200 to 1000 years; such storms shall range in magnitude from average annual events to a Probable Maximum Event, and shall attempt to simulate the total rainfall expected to occur during a 200 to 1000 year period. Final determination of the number and type of tests shall be made by the NRC Project Officer.

C.1.1.B The tests performed in the flumes and rainfall facilities shall be supplemented with additional analytical and field studies. This work shall include analysis of actual field conditions at reclaimed sites where actual gullying has occurred and can be quantified. Up to 15 sites shall be investigated, and sufficient data shall be collected to determine general relationships which can be used to assess long-term changes to gullies with regard to location, depth, and size.

C.1.1.C A final report shall be developed which summarizes the studies conducted and provides generic procedures for assessing the magnitude and rate of gully changes. This report shall include performance assessment methodologies for predicting the location, rate, and magnitude of gullying and shall be applicable to small drainage areas that produce high-velocity flows, such as those found at reclaimed uranium mill sites and low-level waste sites.

C.1.2 - Task 2 - Determination of Allowable Shear Stress

C.1.2.A The Contractor shall conduct up to 10 laboratory and flume tests to determine the best methods for predicting allowable shear stress. The Contractor shall assess the applicability of typical procedures, such as those of the U.S. Army Corps of Engineers and U.S. Bureau of Reclamation. The Contractor shall recommend methods for the determination of appropriate shear stress values for use in prediction of long-term performance of soil covers. The tests shall be conducted for both sheet flow and gully flow and shall include determinations of allowable shear stress and actual shear stress.

C.1.2.B The Contractor shall conduct up to 10 tests in flumes or rainfall facilities to determine the shear stress resistance of various soil types. The collection of data should be conducted in conjunction with Task 1. The Contractor shall determine the allowable stresses associated with both sheet flow and gully flow.

C.1.2.C The Contractor shall prepare a report which provides generic guidance on prediction of shear stresses and/or recommends documented procedures which are the most accurate in predicting allowable shear stresses. The report shall also

recommend quantitative procedures for predicting changes which may occur to shear stress levels as a function of time for a period of 200 to 1000 years.

C.1.3 - Task 3 - Assessment of Unique Designs

C.1.3.A The Contractor shall conduct up to five (5) flume studies to examine the feasibility of protecting soil covers with designs which do not necessarily conform to standard design practice or may be unique to providing stability for a long period of time. Such designs could include rock transition areas between changing slopes, rock chutes, and installation of steeper upstream slopes to offset soil cover requirements.

C.1.3.B The Contractor shall develop other design configurations for possible future testing by examining current practice in the industry.

C.1.3.C The Contractor shall prepare a report summarizing the tests conducted and the parameters measured. The report shall provide procedures and recommendations for designing unique structures or soil slopes.

C.1.4 - Meetings and Trips

C.1.4.A It is estimated that the Contractor shall participate in up to two (2) meetings of 2-days duration each in the Washington, D.C. metropolitan area during each year of the period of performance.

C.1.4.B The Contractor shall participate in up to two (2) meetings of 2-days duration each in the Denver, Colorado area. The first meeting will be an introductory meeting to discuss all aspects of the project. Subsequent meetings will be conducted in the Denver area to review progress, provide for technical dialogue between NRC staff and Contractor, and provide technical guidance on implementation.

C.1.4.C The Contractor shall participate in up to three (3) site visits to low-level waste disposal sites in the Southwestern United States, as directed by the NRC Project Officer.

C.1.4.B Trip reports shall be prepared after all travel performed and shall be submitted under separate cover to the NRC Project Officer within 2 weeks of the completion of travel, unless otherwise approved by the NRC Project Officer. Foreign travel will not be required.

C.1.5 NRC Furnished Material

C.1.5. The NRC Project Officer shall provide the Contractor with necessary federal regulations, regulatory guides, and copies of key NRC documents and reports relevant to all tasks covered under the work scope of this contract. Only the aforementioned property shall be provided by the NRC. This property is subject

to the provisions of the Government Property clause under this contract. All other equipment/property required in performance of the contract shall be furnished by the Contractor.

C.1.6 Estimated Level of Effort

C.1.6. The estimated total level of effort for this contract is approximately 5.0 staff-years with 1.0 staff year in the first year of the project and 2.0 staff years in each of the following two project years. This information is advisory and is not to be considered as the sole basis for the development of the staffing plan. For the purposes of the Government estimate, 2000 hours constitute a staff year.

C.1.7 Technical Reports

Technical reports to be delivered under this contract shall be in accordance with the Technical Reports Article in Section F.

(End of Clause)

C.2 TRAVEL APPROVALS (MAR 1987)

a. All domestic travel requires the prior approval of the Project Officer.

b. All foreign travel must be approved in advance by the NRC on NRC Form 445 and shall be in compliance with 52.247-63 Preference For U.S. Flag Air Carriers. Such approval will be communicated in writing through the Contracting Officer.

(End of Clause)

SECTION D - PACKAGING AND MARKING

D.1 PACKAGING AND MARKING (MAR 1987)

The Contractor shall package material for shipment to the NRC in such a manner that will ensure acceptance by common carrier and safe delivery at destination. Containers and closures shall comply with the Interstate Commerce Commission Regulations, Uniform Freight Classification Rules, or regulations of other carriers as applicable to the mode of transportation. On the front of the package, the Contractor shall clearly identify the contract number under which the product is being provided.

(End of Clause)

SECTION E - INSPECTION AND ACCEPTANCE

E.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE

NOTICE: The following solicitation provisions and/or contract clauses pertinent to this section are hereby incorporated by reference:

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

NUMBER	DATE	TITLE
52.246-5	APR 1984	INSPECTION OF SERVICES-- COST-REIMBURSEMENT

E.2 PLACE OF INSPECTION AND ACCEPTANCE (MAR 1987)

Inspection and acceptance of the deliverable items to be furnished hereunder shall be made by the Project Officer at the destination.

SECTION F - DELIVERIES OR PERFORMANCE

F.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE

NOTICE: The following solicitation provisions and/or contract clauses pertinent to this section are hereby incorporated by reference:

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

NUMBER	DATE	TITLE
52.212-13	AUG 1989	STOP-WORK ORDER ALTERNATE I (APR 1984)

F.2 PREPARATION OF TECHNICAL REPORTS (JUNE 1988)

All technical reports required by Section C and all Technical Progress Reports required by Section F are to be prepared in accordance with the attached NRC Manual Chapter 3202. NRC Manual Chapter 3202 is not applicable to any Contractor Spending Plan (CSP) and any Financial Status Report that may be included in this contract. (See Section J for List of Attachments).

(End of Clause)

F.3 TECHNICAL PROGRESS REPORT (JUNE 1988)
(OMB CLEARANCE NUMBER 3150-0112)

The Contractor shall provide a monthly Technical Progress Report to the Project Officer and the Contracting Officer. The report is due within 15 calendar days after the end of the report period and shall identify the title of the project, the contract number, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report shall include the following for each discrete task:

- a. A listing of the efforts completed during the period; milestones reached or, if missed, an explanation provided;
- b. Any problems or delays encountered or anticipated and recommendations for resolution; (if the recommended resolution involves a contract modification, e.g., change in work requirements, level of effort (cost) or schedule delay, the Contractor shall submit a separate letter to the Contracting Officer identifying the required change and estimated cost impact).
- c. A summary of progress to date; and
- d. Plans for the next reporting period.

(End of Clause)

F.4 FINANCIAL STATUS REPORT (JUNE 1988)
(OMB CLEARANCE NUMBER 3150-0112)

The Contractor shall provide a monthly Financial Status Report to the Project Officer and the Contracting Officer. The report is due within 15 calendar days after the end of the report period and shall identify the title of the project, the contract number, project manager and/or principal investigator, the contract period of performance, and the period covered by the report. Each report shall include the following for each discrete task:

a. Provide total estimated cost (value) of the project as reflected in the contract, the amount of funds available in the contract to date, and the balance of funds required to complete the work as follows:

- 1) Total Estimated Contract Amount.
- 2) Total Funds Obligated To Date.
- 3) Total Costs Incurred This Reporting Period.
- 4) Total Costs Incurred To Date.
- 5) Balance of Obligations Remaining.
- 6) Balance of Funds Required To Complete Contract.

b. Detail of all direct and indirect costs incurred during the reporting period for each task.

c. Update the approved Contractor Spending Plan (CSP) if required under this contract. If there have been no changes to the projections, a certification to that effect may be provided with the Financial Status Report in lieu of the CSP.

(End of Clause)

F.5 PLACE OF DELIVERY--REPORTS (JUNE 1988)

The items to be furnished hereunder shall be delivered, with all charges paid by the Contractor, to:

a. Project Officer (3 copies)

*
 ---*---
 ---*---
 ---*---
 ---*---
 ---*---
 ---*---

b. Contracting Officer (1 copy)

U.S. Nuclear Regulatory Commission
 Contract Number: ___*___
 Division of Contracts and Property Management

Contract Administration Branch
Washington, D.C. 20555

(End of Clause)

F.6 DURATION OF CONTRACT PERIOD (MAR 1987)

This contract shall commence on ____*____ and will expire on ____*____.

(End of Clause)

F.7 TECHNICAL REPORTS FOR TASKS

The contractor shall prepare formal technical reports for each task of the Statement of Work. These reports shall be prepared in accordance with NRC Manual Chapter 3202. Formal reports shall be submitted in draft and final form. Final reports shall be edited and reviewed by the contractor and checked in accordance with the quality assurance requirements described in Article F.8. The formal technical reports shall be self-contained and will be suitable for publication as NUREG/CR Reports.

Draft formal technical reports shall be submitted for review at least 60 days before the completion date of each assigned task. Within 30 days after submittal of the report, the NRC Project Officer will comment in writing on the report. The contractor shall revise the draft formal technical report based upon these comments and submit the final formal technical report to the NRC Project Officer within 30 days after receipt of the NRC Project Officer's comments. All final reports shall be submitted in camera-ready copy to the NRC Document Control Center for publication as a NUREG/CR report.

Technical reports to be obtained from this contract will discuss design methodologies for the evaluation of soil covers to meet appropriate long-term stability requirements. Individual reports will be submitted describing the work performed by the contractor and describing acceptable methods for evaluating the following:

Task 1 - Magnitude and rate of scour and gully erosion. This report shall be submitted within 27 months from the effective date of this contract.

Task 2 - Allowable shear stresses. This report shall be submitted within two years from the effective date of this contract.

Task 3 - Unique design configurations. This report shall be submitted within three years from the effective date of this contract.

Delivery of all reports shall be made to the address specified in Section F of this contract.

F.8 QUALITY ASSURANCE FOR REPORTS

For all draft and final reports delivered under this contract, the contractor shall assure that an independent review and verification of all numerical computations and mathematical equations and derivations are performed by qualified personnel other than the original author(s) of the reports. If the contractor proposes to verify/check less than 100 percent of all computations and mathematical equations and derivations in the report(s), (such as might be the case when there are a large number of routine, repetitive calculations), the contractor must first obtain written approval from the NRC Project Officer. Computer-generated calculations will not require verification where the computer program has already been verified. The NRC Project Officer has the option of auditing all documentation including project correspondence, drafts, calculations, and unrefined data.

In addition, all reports, including those which do not contain numerical analyses must be reviewed by the contractor's management and approved with two signatures, one of which is for the contractor's management at a level above the program manager.

When revisions for the reports are issued, a section must be included in the revised report to document dates of, reasons for, and scope of all changes made since issuance of the first approved report by the contractor.

The NRC has the option of appointing a Peer Group to review the draft report and make changes to the final report. The contractor may recommend candidates for the Peer Group for approval by the NRC Project Officer. In the event of dissent in the content of the final report, the dissenting party will have the option of stating its view points and findings in a section of the report.

SECTION G - CONTRACT ADMINISTRATION DATA

G.1 INDIRECT COST RATES (JUNE 1988) ALTERNATE I (JUNE 1988)

The Contractor shall be reimbursed for allowable indirect costs in accordance with the following predetermined (fixed) rates:

___*___

(End of Clause)

G.2 PROJECT OFFICER AUTHORITY (JUNE 1988)

a. The Contracting Officer's authorized representative hereinafter referred to as the Project Officer for this contract is:

Name: ___*___

Address: ___*___

___*___

___*___

___*___

___*___

___*___

Telephone Number: ___*___

b. Performance of the work under this contract shall be subject to the technical direction of the NRC Project Officer. The term "Technical Direction" is defined to include the following:

- 1) Technical direction to the Contractor which shifts work emphasis between areas of work or tasks, fills in details or otherwise serves to accomplish the contractual statement of work.
- 2) Provide advice and guidance to the Contractor in the preparation of drawings, specifications or technical portions of the work description.
- 3) Review and, where required by the contract, approval of technical reports, drawings, specifications and technical information to be delivered by the Contractor to the Government under the contract.

c. Technical direction must be within the general statement of work stated in the contract. The Project Officer does not have the authority to and may not issue any technical direction which:

- 1) Constitutes an assignment of additional work outside the general scope of the contract.

2) Constitutes a change as defined in the "Changes" clause of this contract.

3) In any way causes an increase or decrease in the total estimated contract cost, the fixed fee, if any, or the time required for contract performance.

4) Changes any of the expressed terms, conditions or specifications of the contract.

5) Terminates the contract, settles any claim or dispute arising under the contract, or issues any unilateral directive whatever.

d. All technical directions shall be issued in writing by the Project Officer or shall be confirmed by such person in writing within ten (10) working days after verbal issuance. A copy of said written direction shall be furnished to the Contracting Officer.

e. The Contractor shall proceed promptly with the performance of technical directions duly issued by the Project Officer in the manner prescribed by this clause and within such person's authority under the provisions of this clause.

f. If, in the opinion of the Contractor, any instruction or direction issued by the Project Officer is within one of the categories as defined in c above, the Contractor shall not proceed but shall notify the Contracting Officer in writing within five (5) working days after the receipt of any such instruction or direction and shall request the Contracting Officer to modify the contract accordingly. Upon receiving such notification from the Contractor, the Contracting Officer shall issue an appropriate contract modification or advise the Contractor in writing that, in the Contracting Officer's opinion, the technical direction is within the scope of this article and does not constitute a change under the Changes Clause.

g. Any unauthorized commitment or direction issued by the Project Officer may result in an unnecessary delay in the Contractor's performance and may even result in the Contractor expending funds for unallowable costs under the contract.

h. A failure of the parties to agree upon the nature of the instruction or direction or upon the contract action to be taken with respect thereto shall be subject to 52.233-1 - Disputes.

i. In addition to providing technical direction as defined above, the Project Officer is responsible for:

1) Monitoring the Contractor's technical progress, including surveillance and assessment of performance, and recommending to the Contracting Officer changes in requirements.

2) Assisting the Contractor in the resolution of technical

problems encountered during performance.

3) Reviewing all costs requested for reimbursement by the Contractor and submitting to the Contracting Officer recommendations for approval, disapproval, or suspension of payment for supplies and services required under this contract.

(End of Clause)

G.3 TRAVEL REIMBURSEMENT (JUNE 1988) ALTERNATE I (JUNE 1988)

a. The Contractor is encouraged to use Government contract airlines, AMTRAK rail service, and discount hotel/motel properties in order to reduce the cost of travel under this contract. The Contracting Officer will, upon request, provide each additional traveler with a letter of identification which is required in order to participate in this program. The Federal Travel Directory (FTD) identifies carriers, contract fares, schedules, payment conditions, and hotel/motel properties which offer their services and rates to Government contractor personnel traveling on official business under this contract. The FTD, which is issued monthly, may be purchased from the U.S. Government Printing Office, Washington, DC 20402.

b. The Contractor will be reimbursed for reasonable domestic travel costs incurred directly and specifically in the performance of this contract. The cost limitations for travel costs are determined by the Federal Travel Regulations that are in effect on the date of the trip. These Regulations specify the daily maximum per diem rates for specific localities within the Conterminous United States (CONUS), the standard CONUS rate, the allowance for meals and incidental expenses (M&IE), the cost of travel by privately owned automobile, and the items which require receipts. A copy of the Regulations may be obtained from the Superintendent of Documents, Government Printing Office, Washington, DC 20402.

c. When the Government changes the Federal Travel Regulations, it is the responsibility of the Contractor to notify the Contracting Officer in accordance with the Limitation of Cost clause of this contract if the Contractor will be unable to make all of the approved trips and remain within the cost and fee limitations of this contract due to the changes.

d. The rates for foreign travel are established by the U.S. Department of State and are listed in a publication entitled "Maximum Travel Per Diem Allowances For Foreign Areas". Copies of this publication may be obtained from the U.S. Government Printing Office, Washington, D.C. 20402.

(End of Clause)

G.4 REMITTANCE ADDRESS (MAR 1987)

If item 15C. of the Standard Form 33 has been checked, enter the remittance address below.

Name: _____

Address: _____

(End of Clause)

SECTION H - SPECIAL CONTRACT REQUIREMENTS

H.1 KEY PERSONNEL (JUNE 1988)

a. The following individuals are considered to be essential to the successful performance of the work hereunder.

_____*_____
_____*_____
_____*_____
_____*_____
_____*_____
_____*_____

The Contractor agrees that such personnel shall not be removed from the contract work or replaced without compliance with paragraphs b and c hereof.

b. If one or more of the key personnel, for whatever reason becomes, or is expected to become unavailable for work under this contract for a continuous period exceeding 30 work days, or is expected to devote substantially less effort to the work than indicated in the proposal or initially anticipated, the Contractor shall immediately notify the Contracting Officer and shall, subject to the concurrence of the Contracting Officer, promptly replace such personnel with personnel of at least substantially equal ability and qualifications.

c. All requests for approval of substitutions hereunder must be in writing and provide a detailed explanation of the circumstances necessitating the proposed substitutions. They must contain a complete resume for the proposed substitute and other information requested by the Contracting Officer to approve or disapprove the proposed substitution. The Contracting Officer will evaluate such requests and promptly notify the Contractor of his/her approval or disapproval thereof in writing.

d. If the Contracting Officer determines that:

1) Suitable and timely replacement of key personnel who have been reassigned, terminated or have otherwise become unavailable for the contract work is not reasonably forthcoming; or

2) That the resultant reduction of effort would be so substantial as to impair the successful completion of the contract, the contract may be terminated by the Contracting Officer for default or for the convenience of the Government, as appropriate. If the Contracting Officer finds the Contractor at fault for the condition, the contract price or fixed fee may be equitably adjusted downward to compensate the Government for any resultant delay, loss or damage.

(End of Clause)

H.2 DISSEMINATION OF CONTRACT INFORMATION (MAR 1987)

The Contractor shall comply with the requirements of the attached NRC Manual Chapters 3202 and 3206 (See Section J for List of Attachments) regarding publications or dissemination to the public of any information, oral or written, concerning the work performed under this contract. Failure to comply with this clause shall be grounds for termination of this contract.

(End of Clause)

H.3 PRIVATE USE OF CONTRACT INFORMATION AND DATA (JUNE 1988)

Except as specifically authorized by this contract, or as otherwise approved by the Contracting Officer, information and other data developed or acquired by or furnished to the Contractor in the performance of this contract shall be used only in connection with the work under this contract.

(End of Clause)

H.4 DRAWINGS, DESIGNS, AND SPECIFICATIONS (JUN 1988)

All drawings, sketches, designs, design data, specifications, notebooks, technical and scientific data, and all photographs, negatives, reports, findings, recommendations, data and memoranda of every description relating thereto, as well as all copies of the foregoing relating to the work or any part thereof, are subject to inspection by the Commission at all reasonable times (for which inspection the proper facilities must be afforded the Commission by the Contractor and its subcontractors), are the property of the Government and may be used by the Government for any purpose whatsoever without any claim on the part of the Contractor and its subcontractors and vendors for additional compensation and must, subject to the right of the Contractor to retain a copy of the material for its own use, be delivered to the Government, or otherwise disposed of by the Contractor either as the Contracting Officer may from time to time direct during the progress of the work or in any event as the Contracting Officer shall direct upon completion or termination of this contract. The Contractor's right of retention and use is subject to the security, patent, and use of information provisions, if any, of this contract.

(End of Clause)

H.5 CONTRACTOR ORGANIZATIONAL CONFLICTS OF INTEREST

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor: (1) is not placed in a conflicting role because of current or planned interests (financial, contractual, organizational, or otherwise) which relate to the work under this contract, and (2) does not obtain an unfair

competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described apply to performance or participation by the contractor as defined in 41 CFR §20-1.5402(f) in the activities covered by this clause.

(c) Work for others. Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization, the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees under this contract abide by the provision of this clause. If the contractor has reason to believe with respect to itself or any employee that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer prior to execution of such contractual arrangement.

(d) Disclosure after award.

(1) The contractor warrants that to the best of its knowledge and belief, and except as otherwise set forth in this contract, it does not have any organizational conflicts of interest as defined in 41 CFR §20-1.5402(a).

(2) The contractor agrees that, if after award, it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement must include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract if termination is in the best interest of the Government.

(e) Access to and use of information.

(1) If the contractor in the performance of this contract obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (Pub. L. 93-579), or data which has not been released to the public, the contractor agrees not to:

(i) Use this information for any private purpose until the information has been released to the public;

(ii) Compete for work for the Commission based on the information for a period of six months after either the completion of this contract or the release of the information to the public, whichever is first;

(iii) Submit an unsolicited proposal to the

Government based on the information until one year after the release of the information to the public, or

(iv) Release the information without prior written approval by the contracting officer unless the information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that, to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (Pub. L. 93-579), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat the information in accordance with restrictions placed on use of the information.

(3) The contractor shall have, subject to patent and security provisions of this contract, the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 41 CFR §20-1.5402(h), the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms "contract," "contractor," and "contracting officer," must be appropriately modified to preserve the Government's rights.

(g) Remedies. For breach of any of the above restrictions, or for intentional nondisclosure or misrepresentation of any relevant interest required to be disclosed concerning this contract or for such erroneous representations that necessarily imply bad faith, the Government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies permitted by law or this contract.

(h) Waiver. A request for waiver under this clause must be directed in writing through the contracting officer to the Executive Director for Operations (EDO) in accordance with the procedures outlined in 41 CFR §20-1.5411.

(End of Clause)

H.6 GOVERNMENT FURNISHED EQUIPMENT/PROPERTY (JUNE 1988)

a. The NRC shall provide the Contractor with necessary federal regulations, regulatory guides, and copies of key NRC documents and reports relevant to all tasks covered under this contract.

b. Only the equipment/property listed above shall be provided by the NRC. This property is subject to the provisions of the Government Property clause under this contract. All other equipment/property required in performance of the contract shall be

furnished by the Contractor.

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I.1 NOTICE LISTING CONTRACT CLAUSES INCORPORATED BY REFERENCE

NOTICE: The following solicitation provisions and/or contract clauses pertinent to this section are hereby incorporated by reference:

FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

NUMBER	DATE	TITLE
52.202-1	APR 1984	DEFINITIONS
52.203-1	APR 1984	OFFICIALS NOT TO BENEFIT
52.203-3	APR 1984	GRATUITIES
52.203-5	APR 1984	COVENANT AGAINST CONTINGENT FEES
52.203-6	JUL 1985	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT
52.203-7	OCT 1988	ANTI-KICKBACK PROCEDURES
52.209-6	MAY 1989	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT
52.215-1	APR 1984	EXAMINATION OF RECORDS BY COMPTROLLER GENERAL
52.215-2	APR 1988	AUDIT -- NEGOTIATION
52.215-33	JAN 1986	ORDER OF PRECEDENCE
52.219-8	FEB 1990	UTILIZATION OF SMALL BUSINESS CONCERNS AND SMALL DISADVANTAGED BUSINESS CONCERNS
52.219-13	AUG 1986	UTILIZATION OF WOMEN-OWNED SMALL BUSINESSES
52.220-3	APR 1984	UTILIZATION OF LABOR SURPLUS AREA CONCERNS
52.222-3	APR 1984	CONVICT LABOR
52.222-26	APR 1984	EQUAL OPPORTUNITY
52.222-35	APR 1984	AFFIRMATIVE ACTION FOR SPECIAL DISABLED AND VIETNAM ERA VETERANS
52.222-36	APR 1984	AFFIRMATIVE ACTION FOR HANDICAPPED WORKERS
52.222-37	JAN 1988	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS AND VETERANS OF THE VIETNAM ERA
52.223-2	APR 1984	CLEAN AIR AND WATER
52.225-13	MAY 1989	RESTRICTIONS ON CONTRACTING WITH SANCTIONED PERSONS

52.227-1	APR 1984	AUTHORIZATION AND CONSENT
52.227-2	APR 1984	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
52.228-7	APR 1984	INSURANCE -- LIABILITY TO THIRD PERSONS
52.232-22	APR 1984	LIMITATION OF FUNDS
52.232-23	JAN 1986	ASSIGNMENT OF CLAIMS
52.233-1	APR 1984	DISPUTES ALTERNATE I (APR 1984)
52.233-3	AUG 1989	PROTEST AFTER AWARD ALTERNATE I (JUN 1985)
52.242-1	APR 1984	NOTICE OF INTENT TO DISALLOW COSTS
52.243-2	AUG 1987	CHANGES -- COST-REIMBURSEMENT ALTERNATE I (APR 1984)
52.244-2	JUL 1985	SUBCONTRACTS (COST-REIMBURSEMENT AND LETTER CONTRACTS)
52.244-5	APR 1984	COMPETITION IN SUBCONTRACTING
52.249-6	MAY 1986	TERMINATION (COST-REIMBURSEMENT)
52.215-22	APR 1988	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA
52.215-24	APR 1985	SUBCONTRACTOR COST OR PRICING DATA
52.216-7	APR 1984	ALLOWABLE COST AND PAYMENT
52.216-11	APR 1984	COST CONTRACT -NO FEE
52.232-9	APR 1989	LIMIT ON WITHHOLDING OF PAYMENTS
52.246-25	APR 1984	LIMITATION OF LIABILITY-SERVICES

I.2 ALLOWABLE COST AND PAYMENT (FAR 52.216-7) (APR 1984)

(a) Invoicing. The Government shall make payments to the Contractor when requested as work progresses, but (except for small business concerns) not more often than once every 2 weeks, in amounts determined to be allowable by the Contracting Officer in accordance with Subpart 31.3 of the Federal Acquisition Regulation (FAR) in effect on the date of this contract and the terms of this contract. The Contractor may submit to an authorized representative of the Contracting Officer, in such form and reasonable detail as the representative may require, an invoice or voucher supported by a statement of the claimed allowable cost for performing this contract.

(b) Reimbursing costs. (1) For the purpose of reimbursing allowable costs (except as provided in subparagraph (2) below, with respect to pension, deferred profit sharing, and employee stock ownership plan contributions), the term "costs" includes only--

(i) Those recorded costs that, at the time of the request for reimbursement, the Contractor has paid by cash, check, or other form of actual payment for items or services purchased directly for the

contract;

(ii) When the Contractor is not delinquent in paying costs of contract performance in the ordinary course of business, costs incurred, but not necessarily paid, for--

(A) Materials issued from the Contractor's inventory and placed in the production process for use on the contract;

(B) Direct labor;

(C) Direct travel;

(D) Other direct in-house costs; and

(E) Properly allocable and allowable indirect costs, as shown in the records maintained by the Contractor for purposes of obtaining reimbursement under Government contracts; and

(iii) The amount of progress payments that have been paid to the Contractor's subcontractors under similar cost standards.

(2) Contractor contributions to any pension, profit-sharing, or employee stock ownership plan funds that are paid quarterly or more often may be included in indirect costs for payment purposes; provided, that the Contractor pays the contribution to the fund within 30 days after the close of the period covered. Payments made 30 days or more after the close of a period shall not be included until the Contractor actually makes the payment. Accrued costs for such contributions that are paid less often than quarterly shall be excluded from indirect costs for payment purposes until the Contractor actually makes the payment.

(3) Notwithstanding the audit and adjustment of invoices or vouchers under paragraph (g) below, allowable indirect costs under this contract shall be obtained by applying indirect cost rates established in accordance with paragraph (d) below.

(4) Any statements in specifications or other documents incorporated in this contract by reference designating performance of services or furnishing of materials at the Contractor's expense or at no cost to the Government shall be disregarded for purposes of cost-reimbursement under this clause.

(c) Small business concerns. A small business concern may be paid more often than every 2 weeks and may invoice and be paid for recorded costs for items or services purchased directly for the contract, even though the concern has not yet paid for those items or services.

(d) Final indirect cost rates. (1) Final annual indirect cost rates and the appropriate bases shall be established in accordance with Subpart 42.7 of the Federal Acquisition Regulation (FAR) in effect for the period covered by the indirect cost rate proposal.

(2) The Contractor shall, within 90 days after the expiration of each of its fiscal years, or by a later date approved by the Contracting Officer, submit to the cognizant Contracting Officer responsible for negotiating its final indirect cost rates and, if required by agency procedures, to the cognizant audit activity proposed final indirect cost rates for that period and supporting cost data specifying the contract and/or subcontract to which the rates apply. The proposed rates shall be based on the Contractor's actual cost experience for that period. The appropriate Government representative and Contractor shall establish the final indirect cost rates as promptly as practical after receipt of the Contractor's proposal.

(3) The Contractor and the appropriate Government representative shall execute a written understanding setting forth the final indirect cost rates. The understanding shall specify (i) the agreed-upon final annual indirect cost rates, (ii) the bases to which the rates apply, (iii) the periods for which the rates apply, (iv) any specific indirect cost items treated as direct costs in the settlement, and (v) the affected contract and/or subcontract, identifying any with advance agreements or special terms and the applicable rates. The understanding shall not change any monetary ceiling, contract obligation, or specific cost allowance or disallowance provided for in this contract. The understanding is incorporated into this contract upon execution.

(4) Failure by the parties to agree on a final annual indirect cost rate shall be a dispute within the meaning of the Disputes clause.

(e) Billing rates. Until final annual indirect cost rates are established for any period, the Government shall reimburse the Contractor at billing rates established by the Contracting Officer or by an authorized representative (the cognizant auditor), subject to adjustment when the final rates are established. These billing rates:

(1) Shall be the anticipated final rates; and

(2) May be prospectively or retroactively revised by mutual agreement, at either party's request, to prevent substantial overpayment or underpayment.

(f) Quick-closeout procedures. When the Contractor and Contracting Officer agree, the quick-closeout procedures of Subpart 42.7 of the FAR may be used.

(g) Audit. At any time or times before final payment, the Contracting Officer may have the Contractor's invoices or vouchers and statements of cost audited. Any payment may be (1) reduced by amounts found by the Contracting Officer not to constitute allowable costs or (2) adjusted for prior overpayments or underpayments.

(h) Final payment. (1) The Contractor shall submit a completion invoice or voucher, designated as such, promptly upon completion of

the work, but no later than one year (or longer, as the Contracting Officer may approve in writing) from the completion date. Upon approval of that invoice or voucher, and upon the Contractor's compliance with all terms of this contract, the Government shall promptly pay any balance of allowable costs and that part of the fee (if any) not previously paid.

(2) The Contractor shall pay to the Government any refunds, rebates, credits, or other amounts (including interest, if any) accruing to or received by the Contractor or any assignee under this contract, to the extent that those amounts are properly allocable to costs for which the Contractor has been reimbursed by the Government. Reasonable expenses incurred by the Contractor for securing refunds, rebates, credits, or other amounts shall be allowable costs if approved by the Contracting Officer. Before final payment under this contract, the Contractor and each assignee whose assignment is in effect at the time of final payment shall execute and deliver--

(i) An assignment to the Government, in form and substance satisfactory to the Contracting Officer, of refunds, rebates, credits, or other amounts (including interest, if any) properly allocable to costs for which the Contractor has been reimbursed by the Government under this contract; and

(ii) A release discharging the Government, its officers, agents, and employees from all liabilities, obligations, and claims arising out of or under this contract, except--

(A) Specified claims stated in exact amounts, or in estimated amounts when the exact amounts are not known;

(B) Claims (including reasonable incidental expenses) based upon liabilities of the Contractor to third parties arising out of the performance of this contract; provided, that the claims are not known to the Contractor on the date of the execution of the release, and that the Contractor gives notice of the claims in writing to the Contracting Officer within 6 years following the release date or notice of final payment date, whichever is earlier; and

(C) Claims for reimbursement of costs, including reasonable incidental expenses, incurred by the Contractor under the patent clauses of this contract, excluding, however, any expenses arising from the Contractor's indemnification of the Government against patent liability.

(End of Clause)

I.3 PAYMENT FOR OVERTIME PREMIUMS (FAR 52.222-2) (JUL 1990)

(a) The use of overtime is authorized under this contract if the overtime premium cost does not exceed \$0 or the overtime premium is paid for work--

- (1) Necessary to cope with emergencies such as those resulting from accidents, natural disasters, breakdowns of production equipment, or occasional production bottlenecks of a sporadic nature;
- (2) By indirect-labor employees such as those performing duties in connection with administration, protection, transportation, maintenance, standby plant protection, operation of utilities, or accounting;
- (3) To perform tests, industrial processes, laboratory procedures, loading or unloading of transportation conveyances, and operations in flight or afloat that are continuous in nature and cannot reasonably be interrupted or completed otherwise; or
- (4) That will result in lower overall costs to the Government.

(b) Any request for estimated overtime premiums that exceeds the amount specified above shall include all estimated overtime for contract completion and shall--

- (1) Identify the work unit; e.g., department or section in which the requested overtime will be used, together with present workload, staffing, and other data of the affected unit sufficient to permit the Contracting Officer to evaluate the necessity for the overtime;
- (2) Demonstrate the effect that denial of the request will have on the contract delivery or performance schedule;
- (3) Identify the extent to which approval of overtime would affect the performance or payments in connection with other Government contracts, together with identification of each affected contract; and
- (4) Provide reasons why the required work cannot be performed by using multishift operations or by employing additional personnel.

(End of Clause)

I.4 DRUG-FREE WORKPLACE (FAR 52.223-6) (JUL 1990)

(a) Definitions. As used in this clause, "Controlled Substances" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11-1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means the site(s) for the performance of work done by the Contractor in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract. "Directly engaged" is defined to include all direct cost employees and any other Contractor employee who has other than a minimal impact or involvement in contract performance.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) The Contractor, if other than an individual, shall--within 30 calendar days after award (unless a longer period is agreed to in writing for contracts of 30 calendar days or more performance duration); or as soon as possible for contracts of less than 30 calendar days performance duration--

(1) Publish a statement notifying its employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish an ongoing drug-free awareness program to inform such employees about--

(i) The dangers of drug abuse in the workplace;

(ii) The contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this clause;

(4) Notify such employees in writing in the statement required by subparagraph (b)(1) of this clause, that as a condition of continued employment on this contract, the employee will--

(i) Abide by the terms of the statement; and

(ii) Notify the employer in writing of the employee's conviction under a criminal drug statute for a violation occurring in the workplace no later than 5 days after such conviction;

(5) Notify the Contracting Officer in writing within 10 calendar days after receiving notice under subdivision (b)(4)(ii) of this clause, from an employee or otherwise receiving actual notice of such conviction. The notice shall include the position title of the employee;

(6) Within 30 days after receiving notice under subparagraph (b)(4)(ii) of this clause of a conviction, take one of the following actions with respect to any employee who is convicted of a drug abuse violation occurring in the workplace:

(i) Taking appropriate personnel action against such employee, up to and including termination; or

(ii) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this clause.

(c) The Contractor, if an individual, agrees by award of the contract or acceptance of a purchase order, not to engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in the performance of this contract.

(d) In addition to other remedies available to the Government, the Contractor's failure to comply with the requirements of paragraphs (b) or (c) of this clause may, pursuant to FAR 23.506, render the Contractor subject to suspension of contract payments, termination of the contract for default, and suspension or debarment.

(End of Clause)

I.5 RIGHTS TO PROPOSAL DATA (TECHNICAL) (FAR 52.227-23) (JUN 1987)

Except for data contained on pages _____, it is agreed that as a condition of award of this contract, and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the "Rights in Data--General" clause contained in this contract) in and to the technical data contained in the proposal dated _____ upon which this contract is based.

(End of Clause)

I.6 PROMPT PAYMENT (FAR 52.232-25) (APR 1989)

Notwithstanding any other payment clause in this contract, the Government will make invoice payments and contract financing payments under the terms and conditions specified in + . . . clause.

Payment shall be considered as being made on the day a check is dated or an electronic funds transfer is made. Definitions of pertinent terms are set forth in 32.902. All days referred to in this clause are calendar days, unless otherwise specified. The term "foreign vendor" means an incorporated concern not incorporated in the United States, or unincorporated concern having its principal place of business outside the United States.

(a) Invoice Payments.

(1) For purposes of this clause, "invoice payment" means a Government disbursement of monies to a Contractor under a contract or other authorization for supplies or services accepted by the Government. This includes payments for partial deliveries that have been accepted by the Government and final cost or fee payments where amounts owed have been settled between the Government and the Contractor.

(2) Except as indicated in subparagraph (a)(3) and paragraph (c) of this clause, the due date for making invoice payments by the designated payment office shall be the later of the following two events:

(i) The 30th day after the designated billing office has received a proper invoice from the Contractor.

(ii) The 30th day after Government acceptance of supplies delivered or services performed by the Contractor. On a final invoice where the payment amount is subject to contract settlement actions, acceptance shall be deemed to have occurred on the effective date of the contract settlement. However, if the designated billing office fails to annotate the invoice with the actual date of receipt, the invoice payment due date shall be deemed to be the 30th day after the date the Contractor's invoice is dated, provided a proper invoice is received and there is no disagreement over quantity, quality, or Contractor compliance with contract requirements.

(3) The due date on contracts for meat and meat food products, contracts for perishable agricultural commodities, contracts for dairy products, edible fats or oils, and food products prepared from edible fats or oils, and contracts not requiring submission of an invoice shall be as follows:

(i) The due date for meat and meat food products, as defined in section 2(a)(3) of the Packers and Stockyard Act of 1921 (7 U.S.C. 182(3)) and further defined in Pub. L. 98-181 to include any edible fresh or frozen poultry meat, any perishable poultry meat food product, fresh eggs, and any perishable egg product, will be as close as possible to, but not later than, the 7th day after product delivery.

(ii) The due date for perishable agricultural commodities, as defined in Section 1(4) of the Perishable Agricultural Commodities Act of 1930 (7 U.S.C. 499a(4)), will be as close as possible to,

but not later than, the 10th day after product delivery, unless another date is specified in the contract.

(iii) The due date for dairy products, as defined in Section 111(e) of the Dairy Production Stabilization Act of 1983 (7 U.S.C. 4502(e)), edible fats or oils, will be as close as possible to, but not later than, the 10th day after the date on which a proper invoice has been received.

(4) An invoice is the Contractor's bill or written request for payment under the contract for supplies delivered or services performed. An invoice shall be prepared and submitted to the designated billing office specified in the contract. A proper invoice must include the items listed in subdivisions (a)(4)(i) through (a)(4)(viii) of the clause. If the invoice does not comply with these requirements, then the contractor will be notified of the defect within 7 days after receipt of the invoice at the designated billing office (3 days for meat and meat food products and 5 days for perishable agricultural commodities, edible fats or oils, and food products prepared from edible fats or oils). Untimely notification will be taken into account in the computation of any interest penalty owed the Contractor in the manner described in subparagraph (a)(6) of this clause.

(i) Name and address of the Contractor.

(ii) Invoice date.

(iii) Contract number or other authorization for supplies delivered or services performed (including order number and contract line item number).

(iv) Description, quantity, unit of measure, unit price, and extended price of supplies delivered or services performed.

(v) Shipping and payment terms (e.g., shipment number and date of shipment, prompt payment discount terms). Bill of lading number and weight of shipment will be shown for shipments on Government bills of lading.

(vi) Name and address of Contractor official to whom payment is to be sent (must be the same as that in the contract or in a proper notice of assignment).

(vii) Name (where practicable), title, phone number and mailing address of person to be notified in event of a defective invoice.

(viii) Any other information or documentation required by other requirements of the contract (such as evidence of shipment).

(5) An interest penalty shall be paid automatically by the Government, without request from the Contractor, if payment is not made by the due date and the conditions listed in subdivisions (a)(5)(i) through (a)(5)(iii) of this clause are met, if applicable.

An interest penalty shall not be paid on contracts awarded to foreign vendors outside the United States for work performed outside the United States.

(i) A proper invoice was received by the designated billing office.

(ii) A receiving report or other Government documentation authorizing payment was processed and there was no disagreement over quantity, quality, or contractor compliance with any contract term or condition.

(iii) In the case of a final invoice for any balance of funds due the Contractor for supplies delivered or services performed, the amount was not subject to further contract settlement actions between the Government and the Contractor.

(6) The interest penalty shall be at the rate established by the Secretary of the Treasury under Section 12 of the Contract Disputes Act of 1978 (41 U.S.C. 611) that is in effect on the day after the due date, except where the interest penalty is prescribed by other governmental authority. This rate is referred to as the "Renegotiation Board Interest Rate," and it is published in the Federal Register semiannually on or about January 1 and July 1. The interest penalty shall accrue daily on the invoice payment amount approved by the Government and be compounded in 30-day increments inclusive from the first day after the due date through the payment date. That is, interest accrued at the end of any 30-day period will be added to the approved invoice payment amount and be subject to interest penalties if not paid in the succeeding 30-day period. If the designated billing office failed to notify the contractor of a defective invoice within the periods prescribed in subparagraph (a)(4) of this clause, then the due date on the corrected invoice will be adjusted by subtracting the number of days taken beyond the prescribed notification of defects period. Any interest penalty owed the Contractor will be based on this adjusted due date. Adjustments will be made by the designated payment office for errors in calculating interest penalties, if requested by the Contractor.

(i) For the sole purpose of computing an interest penalty that might be due the contractor, Government acceptance shall be deemed to have occurred constructively on the 7th day after the contractor delivered the supplies or performed the services in accordance with the terms and conditions of the contract, unless there is a disagreement over quantity, quality, or contractor compliance with a contract provision. In the event that actual acceptance occurs within the constructive acceptance period, the determination of an interest penalty shall be based on the actual date of acceptance. The constructive acceptance requirement does not, however, compel Government officials to accept supplies or services, perform contract administration functions, or make payment prior to fulfilling their responsibilities.

(ii) The following periods of time will not be included in the determination of an interest penalty:

(A) The period taken to notify the contractor of defects in invoices submitted to the Government, but this may not exceed 7 days (3 days for meat and meat food products and 5 days for perishable agricultural commodities, dairy products, edible fat or oils, and food products prepared from edible fats or oils).

(B) The period between the defects notice and resubmission of the corrected invoice by the Contractor.

(iii) Interest penalties will not continue to accrue after the filing of a claim for such penalties under the clause at 52.233-1, Disputes, or for more than 1 year. Interest penalties of less than \$1.00 need not be paid.

(iv) Interest penalties are not required on payment delays due to disagreement between the Government and Contractor over the payment amount or other issues involving contract compliance or on amounts temporarily withheld or retained in accordance with the terms of the contract. Claims involving disputes, and any interest that may be payable, will be resolved in accordance with the clause at 52.233-1, Disputes.

(7) An interest penalty shall also be paid automatically by the designated payment office, without request from the contractor, if a discount for prompt payment is taken improperly. The interest penalty will be calculated as described in subparagraph (a)(6) of this clause on the amount of discount taken for the period beginning with the first day after the end of the discount period through the date when the Contractor is paid.

(8) If this contract was awarded on or after October 1, 1989, a penalty amount, calculated in accordance with regulations issued by the Office of Management and Budget, shall be paid in addition to the interest penalty amount if the contractor:

(i) Is owed an interest penalty;

(ii) Is not paid the interest penalty within 10 days after the date the invoice amount is paid; and

(iii) Makes a written demand, not later than 40 days after the date the invoice amount is paid, that the agency pay such a penalty.

(b) Contract Financing Payments.

(1) For purposes of this clause, "contract financing payment" means a Government disbursement of monies to a Contractor under a contract clause or other authorization prior to acceptance of supplies or services by the Government. Contract financing payments include advance payments, progress payments based on cost under the clause at 52.232-16, Progress Payments, progress payments based on a percentage or stage of completion (32.102(e)(1)) other than those made under the clause at 52.232-5, Payments Under Fixed-Price

Construction Contracts, or the clause at 52.232-10, Payments Under Fixed-Price Architect-Engineer Contracts, and interim payments on cost type contracts.

(2) For contracts that provide for contract financing, requests for payment shall be submitted to the designated billing office as specified in this contract or as directed by the Contracting Officer. Contract financing payments shall be made on the 30th day after receipt of a proper contract financing request by the designated billing office. In the event that an audit or other review of a specific financing request is required to ensure compliance with the terms and conditions of the contract, the designated payment office is not compelled to make payment by the due date specified.

(3) For advance payments, loans, or other arrangements that do not involve recurrent submissions of contract financing requests, payment shall be made in accordance with the corresponding contract terms or as directed by the Contracting Officer.

(4) Contract financing payments shall not be assessed an interest penalty for payment delays.

(c) If this contract contains the clause at 52.213-1, Fast Payment Procedure, payments will be made within 15 days after the date of receipt of the invoice.

(End of Clause)

I.7 ELECTRONIC FUNDS TRANSFER PAYMENT METHODS (FAR 52.232-28)
(APR 1989)

Payments under this contract will be made by the Government either by check or electronic funds transfer (through the Treasury Fedline Payment System (FEDLINE) or the Automated Clearing House (ACH), at the option of the Government. After award, but no later than 14 days before an invoice or contract financing request is submitted, the Contractor shall designate a financial institution for receipt of electronic funds transfer payment, and shall submit this designation to the Contracting Officer or other Government Official, as directed.

(a) For payment through FEDLINE, the Contractor shall provide the following information:

(1) Name, address, and telegraphic abbreviation of the financial institution receiving payment.

(2) The American Bankers Association 9-digit identifying number for wire transfers of the financing institution receiving payment if the institution has access to the Federal Reserve Communications System.

(3) Payee's account number at the financial institution where

funds are to be transferred.

(4) If the financial institution does not have access to the Federal Reserve Communications System, name, address, and telegraphic abbreviation of the correspondent financial institution through which the financial institution receiving payment obtains wire transfer activity. Provide the telegraphic abbreviation and the American Bankers Association identifying number for the correspondent institution.

(b) For payment through ACH, the Contractor shall provide the following information:

(1) Routing transit number of the financial institution receiving payment (same as American Bankers Association identifying number used for FEDLINE).

(2) Number of account to which funds are to be deposited.

(3) Type of depositor account ("C" for checking, "S" for savings).

(4) If the Contractor is a new enrollee to the ACH system, a "Payment Information Form," SF 3881, must be completed before payment can be processed.

(c) In the event the Contractor, during the performance of this contract, elects to designate a different financial institution for the receipt of any payment made using electronic funds transfer procedures, notification of such change and the required information specified above must be received by the appropriate Government official 30 days prior to the date such change is to become effective.

(d) The documents furnishing the information required in this clause must be dated and contain the signature, title, and telephone number of the Contractor official authorized to provide it, as well as the Contractor's name and contract number.

(e) Contractor failure to properly designate a financial institution or to provide appropriate payee bank account information may delay payment of amounts otherwise properly due.

(End of Clause)

I.8 CLAUSES INCORPORATED BY REFERENCE
(FAR 52.252-2) (JUN 1988)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available.

(End of Clause)

I.9 LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS--(FAR 52.203-12) (JAN 1990)

(a) Definitions.

"Agency", as used in this clause, means executive agency as defined in 2.101.

"Covered Federal action," as used in this clause, means any of the following Federal actions:

- (a) The awarding of any Federal contract.
- (b) The making of any Federal grant.
- (c) The making of any Federal loan.
- (d) The entering into of any cooperative agreement.
- (e) The extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

"Indian tribe" and "tribal organization," as used in this clause, have the meaning provided in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) and include Alaskan Natives.

"Influencing or attempting to influence," as used in this clause, means making, with the intent to influence, any communication to or appearance before an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any covered Federal action.

"Local government," as used in this clause, means a unit of government in a State and, if chartered, established, or otherwise recognized by a State for the performance of a governmental duty, including a local public authority, a special district, an intrastate district, a council of governments, a sponsor group representative organization, and any other instrumentality of a local government.

"Officer or employee of an agency," as used in this clause, includes the following individuals who are employed by an agency:

- (a) An individual who is appointed to a position in the Government under title 5, United States Code, including a position under a temporary appointment.
- (b) A member of the uniformed services, as defined in subsection 101(3), title 37, United States Code.
- (c) A special Government employee, as defined in section 202, title 18, United States Code.
- (d) An individual who is a member of a Federal advisory committee, as defined by the Federal Advisory Committee Act, title 5, United States Code, appendix 2.

"Person," as used in this clause, means an individual, corporation, company, association, authority, firm, partnership, society, State, and local government, regardless of whether such entity is operated for profit, or not for profit. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Reasonable compensation," as used in this clause, means, with respect to a regularly employed officer or employee of any person, compensation that is consistent with the normal compensation for such officer or employee for work that is not furnished to, not funded by, or not furnished in cooperation with the Federal Government.

"Reasonable payment," as used in this clause, means, with respect to professional and other technical services, a payment in an amount that is consistent with the amount normally paid for such services in the private sector.

"Recipient," as used in this clause, includes the Contractor and all subcontractors. This term excludes an Indian tribe, tribal organization, or any other Indian organization with respect to expenditures specifically permitted by other Federal law.

"Regularly employed," as used in this clause, means, with respect to an officer or employee of a person requesting or receiving a Federal contract, an officer or employee who is employed by such person for at least 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person for receipt of such contract. An officer or employee who is employed by such person for less than 130 working days within 1 year immediately preceding the date of the submission that initiates agency consideration of such person shall be considered to be regularly employed as soon as he or she is employed by such person for 130 working days.

"State," as used in this clause, means a State of the United States, the District of Columbia, the Commonwealth of Puerto Rico, a territory or possession of the United States, an agency or instrumentality of a State, and a multi-State, regional, or interstate entity having governmental duties and powers.

(b) Prohibitions.

(1) Section 1352 of title 31, United States Code, among other things, prohibits a recipient of a Federal contract, grant, loan, or cooperative agreement from using appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any

cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(2) The Act also requires Contractors to furnish a disclosure if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

(3) The prohibitions of the Act do not apply under the following conditions:

(i) Agency and legislative liaison by own employees.

(A) The prohibition on the use of appropriated funds, in paragraph (b)(1) of this clause, does not apply in the case of a payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action if the payment is for agency and legislative liaison activities not directly related to a covered Federal action.

(B) For purposes of subdivision (b)(3)(i)(A) of this clause, providing any information specifically requested by an agency or Congress is permitted at any time.

(C) The following agency and legislative liaison activities are permitted at any time where they are not related to a specific solicitation for any covered Federal action:

(1) Discussing with an agency the qualities and characteristics (including individual demonstrations) of the person's products or services, conditions or terms of sale, and service capabilities.

(2) Technical discussions and other activities regarding the application or adaptation of the person's products or services for an agency's use.

(D) The following agency and legislative liaison activities are permitted where they are prior to formal solicitation of any covered Federal action--

(1) Providing any information not specifically requested but necessary for an agency to make an informed decision about initiation of a covered Federal action;

(2) Technical discussions regarding the preparation of an unsolicited proposal prior to its official submission; and

(3) Capability presentations by persons seeking awards from an agency pursuant to the provisions of the Small Business Act, as amended by Pub. L. 95-507, and subsequent

amendments.

(E) Only those activities expressly authorized by subdivision (b)(3)(1)(A) of this clause are permitted under this clause.

(11) Professional and technical services.

(A) The prohibition on the use of appropriated funds, in subparagraph (b)(1) of this clause, does not apply in the case of--

(1) A payment of reasonable compensation made to an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action, if payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action.

(2) Any reasonable payment to a person other than an officer or employee of a person requesting or receiving a covered Federal action or an extension, continuation, renewal, amendment, or modification of a covered Federal action if the payment is for professional or technical services rendered directly in the preparation, submission, or negotiation of any bid, proposal, or application for that Federal action or for meeting requirements imposed by or pursuant to law as a condition for receiving that Federal action. Persons other than officers or employees of a person requesting or receiving a covered Federal action include consultants and trade associations.

(B) For purposes of subdivision (b)(3)(11)(A) of this clause, "professional and technical services" shall be limited to advice and analysis directly applying any professional or technical discipline. For example, drafting of a legal document accompanying a bid or proposal by a lawyer is allowable.

Similarly, technical advice provided by an engineer on the performance or operational capability of a piece of equipment rendered directly in the negotiation of a contract is allowable. However, communications with the intent to influence made by a professional (such as a licensed lawyer) or a technical person (such as a licensed accountant) are not allowable under this section unless they provide advice and analysis directly applying their professional or technical expertise and unless the advice or analysis is rendered directly and solely in the preparation, submission or negotiation of a covered Federal action. Thus, for example, communications with the intent to influence made by a lawyer that do not provide legal advice or analysis directly and solely related to the legal aspects of his or her client's proposal, but generally advocate one proposal over another are not allowable under this section because the lawyer is not providing professional legal services. Similarly, communications with the

intent to influence made by an engineer providing an engineering analysis prior to the preparation or submission of a bid or proposal are not allowable under this section since the engineer is providing technical services but not directly in the preparation, submission or negotiation of a covered Federal action.

(C) Requirements imposed by or pursuant to law as a condition for receiving a covered Federal award include those required by law or regulation and any other requirements in the actual award documents.

(D) Only those services expressly authorized by subdivisions (b)(3)(ii)(A)(1) and (2) of this clause are permitted under this clause.

(E) The reporting requirements of FAR 3.803(a) shall not apply with respect to payments of reasonable compensation made to regularly employed officers or employees of a person.

(iii) Disclosure.

(A) The Contractor who requests or receives from an agency a Federal Contract shall file with that agency a disclosure form, OMB standard form LLL, Disclosure of Lobbying Activities, if such person has made or has agreed to make any payment using nonappropriated funds (to include profits from any covered Federal action), which would be prohibited under subparagraph (b)(1) of this clause, if paid for with appropriated funds.

(B) The Contractor shall file a disclosure form at the end of each calendar quarter in which there occurs any event that materially affects the accuracy of the information contained in any disclosure form previously filed by such person under subparagraph (c)(1) of this clause. An event that materially affects the accuracy of the information reported includes--

(1) A cumulative increase of \$25,000 or more in the amount paid or expected to be paid for influencing or attempting to influence a covered Federal action; or

(2) A change in the person(s) or individual(s) influencing or attempting to influence a covered Federal action; or

(3) A change in the officer(s), employee(s), or Member(s) contacted to influence or attempt to influence a covered Federal action.

(C) The Contractor shall require the submittal of a certification, and if required, a disclosure form by any person who requests or received any subcontract exceeding \$100,000 under the Federal contract.

(D) All subcontractor disclosure forms (but not certification) shall be forwarded from tier to tier until received by the prime Contractor. The prime Contractor shall submit all

disclosures to the Contracting Officer at the end of the calendar quarter in which the disclosure form is submitted by the subcontractor. Each subcontractor certification shall be retained in the subcontract file of the awarding Contractor.

(iv) Agreement. The Contractor agrees not to make any payment prohibited by this clause.

(v) Penalties.

(A) Any person who makes an expenditure prohibited under paragraph (a) of this clause or who fails to file or amend the disclosure form to be filed or amended by paragraph (b) of this clause shall be subject to civil penalties as provided for by 31 U.S.C. 1352. An imposition of a civil penalty does not prevent the Government from seeking any other remedy that may be applicable.

(B) Contractors may rely without liability on the representation made by their subcontractors in the certification and disclosure form.

(vi) Cost allowability. Nothing in this clause makes allowable or reasonable any costs which would otherwise be unallowable or unreasonable. Conversely, costs made specifically unallowable by the requirements in this clause will not be made allowable under any other provision.

(End of clause)

PART III - LIST OF DOCUMENTS, EXHIBITS
AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

J.1 ATTACHMENTS (MAR 1987)

<u>Attachment Number</u>	<u>Title</u>
1	Billing Instructions
2	NRC Contractor Organizational Conflicts of Interest (41 CFR Part 20)
3	NRC Manual Chapter 3202
4	Standard Form 1411 with Instructions
5	Contractor Spending Plan (CSP) Instructions
6	NUREG-0650, Technical Writing Style Guide

PART IV - REPRESENTATIONS AND INSTRUCTIONS

SECTION K - REPRESENTATIONS, CERTIFICATIONS AND
OTHER STATEMENTS OF OFFERORS

K.1 CONTINGENT FEE REPRESENTATION AND
AGREEMENT (FAR 52.203-4) (APR 1984)

(a) Representation. The offeror represents that, except for full-time bona fide employees working solely for the offeror, the offeror--

(Note: The offeror must check the appropriate boxes. For interpretation of the representation, including the term "bona fide employee," see Subpart 3.4 of the Federal Acquisition Regulation.)

(1) () has, (x) has not employed or retained any person or company to solicit or obtain this contract; and

(2) () has, (x) has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(b) Agreement. The offeror agrees to provide information relating to the above Representation as requested by the Contracting Officer and, when subparagraph (a)(1) or (a)(2) is answered affirmatively, to promptly submit to the Contracting Officer--

(1) A completed Standard Form 119, Statement of Contingent or Other Fees, (SF 119); or

(2) A signed statement indicating that the SF 119 was previously submitted to the same contracting office, including the date and applicable solicitation or contract number, and representing that the prior SF 119 applies to this offer or quotation.

(End of Provision)

K.2 TAXPAYER IDENTIFICATION (FAR 52.204-3) (SEP 1989)

(a) Definitions. "Common parent," as used in the solicitation provision, means that corporate entity that owns or controls an affiliated group of corporations that files its Federal income tax returns on a consolidated basis, and of which the offeror is a member.

"Corporate status," as used in this solicitation provision, means

a designation as to whether the offeror is a corporate entity, an unincorporated entity (e.g., sole proprietorship or partnership), or a corporation providing medical and health care services.

"Taxpayer Identification Number (TIN)," as used in this solicitation provision, means the number required by the IRS to be used by the offeror in reporting income tax and other returns.

(b) The offeror is required to submit the information required in paragraphs (c) through (e) of this solicitation provision in order to comply with reporting requirements of 26 U.S.C. 6041, 6041A, and 6050M and implementing regulations issued by the Internal Revenue Service (IRS). If the resulting contract is subject to reporting requirements described in 4.902(a), the failure or refusal by the offeror to furnish the information may result in a 20 percent reduction of payments otherwise due under the contract.

(c) Taxpayer Identification Number (TIN).

TIN: 34 6000 545

TIN: has been applied for.

TIN: is not required because:

Offeror is a nonresident alien, foreign corporation, or foreign partnership that does not have income effectively connected with the conduct of a trade or business in the U.S. and does not have an office or place of business or a fiscal paying agent in the U.S;

Offeror is an agency or instrumentality of a foreign government;

Offeror is an agency or instrumentality of a Federal, state or local government;

Other. State basis. _____

(d) Corporate Status.

Corporation providing medical and health care services, or engaged in the billing and collecting of payments for such services;

Other corporate entity;

Not a corporate entity;

Sole proprietorship;

Partnership;

Hospital or extended care facility described in 26 CFR 501(c)(3) that is exempt from taxation under 26 CFR 501(a).

(e) Common Parent.

Offeror is not owned or controlled by a common parent as defined in paragraph (a) of this clause.

Name and TIN of common parent;

Name _____

TIN _____

(End of Provision)

K.3 CERTIFICATION REGARDING DEBARMENT, SUSPENSION,
PROPOSED DEBARMENT, AND OTHER RESPONSIBILITY
MATTERS (FAR 52.209-5) (MAY 1989)

(a)(1) The Offeror certifies, to the best of its knowledge and belief, that -

(i) The Offeror and/or any of its Principals -

(A) Are () are not (x) presently debarred, suspended, proposed for debarment, or declared ineligible for the award of contracts by any Federal agency;

(B) Have () have not (x), within a 3-year period preceding this offer, been convicted of or had a civil judgment rendered against them for: commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, state, or local) contract or subcontract; violation of Federal or state antitrust statutes relating to the submission of offers; or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property; and

(C) () are not (x) presently indicted for, or otherwise criminally or civilly charged by a governmental entity with, commission of any of the offenses enumerated in subdivision (a)(1)(i)(B) of this provision.

(ii) The Offeror has () has not (x), within a 3-year period preceding this offer, had one or more contracts terminated for default by any Federal agency.

(2) "Principals," for the purposes of this certification, means officers; directors; owners; partners; and, persons having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a subsidiary, division, or business segment, and similar positions).

THIS CERTIFICATION CONCERNS A MATTER WITHIN THE JURISDICTION OF AN AGENCY OF THE UNITED STATES AND THE MAKING OF A FALSE, FICTITIOUS, OR FRAUDULENT CERTIFICATION MAY RENDER THE MAKER SUBJECT TO PROSECUTION UNDER SECTION 1001, TITLE 18, UNITED STATES CODE.

(b) The Offeror shall provide immediate written notice to the Contracting Officer if, at any time prior to contract award, the Offeror learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.

(c) A certification that any of the items in paragraph (a) of this provision exists will not necessarily result in withholding of an award under this solicitation. However, the certification will be considered in connection with a determination of the Offeror's responsibility. Failure of the Offeror to furnish a certification or provide such additional information as requested by the Contracting Officer may render the Offeror nonresponsible.

(d) Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by paragraph (a) of this provision. The knowledge and information of an Offeror is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

(e) The certification in paragraph (a) of this provision is a material representation of fact upon which reliance was placed when making award. If it is later determined that the Offeror knowingly rendered an erroneous certification, in addition to other remedies available to the Government, the Contracting Officer may terminate the contract resulting from this solicitation for default.

(End of Provision)

K.4 TYPE OF BUSINESS ORGANIZATION (FAR 52.215-6) (JUL 1987)

The offeror or quoter, by checking the applicable box, represents that--

(a) It operates as a corporation incorporated under the laws of the State of _____, an individual, a partnership, a nonprofit organization, or a joint venture; or

(b) If the offeror or quoter is a foreign entity, it operates as an individual, a partnership, a nonprofit organization, a joint venture, or a corporation, registered for business in _____ (country).

(End of Provision)

K.5 AUTHORIZED NEGOTIATORS (FAR 52.215-11) (APR 1984)

The offeror or quoter represents that the following persons are authorized to negotiate on its behalf with the Government in connection with this request for proposals or quotations: (list names, titles, and telephone numbers of the authorized negotiators).

John E. Caron

Contracts & Grants Administrator

(303) 491-6355

(End of Provision)

K.6 SMALL BUSINESS CONCERN REPRESENTATION (FAR 52.219-1) (FEB 1990)

(a) Representation. The offeror represents and certifies as part of its offer that it _____ is, is not a small business concern and that _____ all, not all end items to be

furnished will be manufactured or produced by a small business concern in the United States, its territories or possessions, Puerto Rico, or the Trust Territory of the Pacific Islands.

(b) Definition.

Small business concern, as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in this solicitation.

(c) Notice. Under 15 U.S.C. 645(d), any person who misrepresents a firm's status as a small business concern in paragraph (a) of this clause in order to obtain a contract to be awarded under the preference programs established pursuant to sections 8(a), 8(d), 9, or 15 of the Small Business Act or any other provision of Federal law that specifically references section 8(d) for a definition of program eligibility, shall (1) be punished by imposition of a fine, imprisonment, or both; (2) be subject to administrative remedies; and (3) be ineligible for participation in programs conducted under the authority of the Act.

(End of Provision)

K.7 SMALL DISADVANTAGED BUSINESS CONCERN REPRESENTATION
(FAR 52.219-2) (FEB 1990)

(a) Representation. The offeror represents that it _____ is,
 x is not a small disadvantaged business concern.

(b) Definitions.

Asian Pacific Americans, as used in this provision, means United States citizens whose origins are in Japan, China, the Philippines, Vietnam, Korea, Samoa, Guam, the U.S. Trust Territory of the Pacific Islands (Republic of Palau), the Northern Mariana Islands, Laos, Kampuchea (Cambodia), Taiwan, Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Republic of the Marshall Islands, or the Federated States of Micronesia.

Indian tribe, as used in this provision, means any Indian tribe, band, nation, or other organized group or community of Indians, including any Alaska Native Corporation as defined in 13 CFR 124.100 which is recognized as eligible for the special programs and services provided by the U.S. to Indians because of their status as Indians, or which is recognized as such by the State in which such tribe, band, nation, group, or community resides.

Native Americans, as used in this provision, means American Indians, Eskimos, Aleuts, and native Hawaiians.

Native Hawaiian Organization, as used in this provision, means any community service organization serving Native Hawaiians in, and chartered as a not-for-profit organization by, the State of Hawaii,

which is controlled by Native Hawaiians, and whose business activities will principally benefit such Native Hawaiians.

Small business concern, as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR part 121.

Small disadvantaged business concern, as used in this provision, means a small business concern that (a) is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals and (b) has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business having at least 51 percent of its stock unconditionally owned by one of these entities which has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and which meets the requirements of 13 CFR part 124.

Subcontinent Asian Americans, as used in this provision, means United States citizens whose origins are in India, Pakistan, Bangladesh, Sri Lanka, Bhutan, or Nepal.

(c) Qualified groups. The offeror shall presume that socially and economically disadvantaged individuals include Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, Subcontinent Asian Americans, and other individuals found to be qualified by SBA under 13 CFR 124. The offeror shall presume that socially and economically disadvantaged entities also include Indian tribes and Native Hawaiian Organizations.

(End of Provision)

K.8 WOMEN-OWNED SMALL BUSINESS REPRESENTATION
(FAR 52.219-3) (APR 1984)

(a) Representation. The offeror represents that it () is, (x) is not a women-owned small business concern.

(b) Definitions.

"Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominate in the field of operation in which it is bidding on Government contracts, and qualified as a small business under the criteria and size standards in 13 CFR 121.

"Women-owned," as used in this provision, means a small business that is at least 51 percent owned by a woman or women who are U.S.

citizens and who also control and operate the business.

(End of Provision)

K.9 PREFERENCE FOR LABOR SURPLUS AREA CONCERNS
(FAR 52.220-1) (APR 1984)

(a) This acquisition is not a set aside for labor surplus area (LSA) concerns. However, the offeror's status as such a concern may affect (1) entitlement to award in case of tie offers or (2) offer evaluation in accordance with the Buy American Act clause of this solicitation. In order to determine whether the offeror is entitled to a preference under (1) or (2) above, the offeror must identify, below, the LSA in which the costs to be incurred on account of manufacturing or production (by the offeror or the first-tier subcontractors) amount to more than 50 percent of the contract price.

(b) Failure to identify the locations as specified above will preclude consideration of the offeror as an LSA concern. If the offeror is awarded a contract as an LSA concern and would not have otherwise qualified for award, the offeror shall perform the contract or cause the contract to be performed in accordance with the obligations of an LSA concern.

(End of Provision)

K.10 CERTIFICATION OF NONSEGREGATED FACILITIES
(FAR 52.222-21) (APR 1984)

(a) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.

(b) By the submission of this offer, the offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The offeror agrees that a breach of this certification is a violation of the Equal Opportunity clause in the contract.

(c) The offeror further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will--

(1) Obtain identical certifications from proposed subcontractors before the award of subcontracts under which the subcontractor will be subject to the Equal Opportunity clause;

(2) Retain the certifications in the files; and

(3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR
CERTIFICATIONS OF NONSEGREGATED FACILITIES

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract under which the subcontractor will be subject to the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

(End of Provision)

K.11 PREVIOUS CONTRACTS AND COMPLIANCE REPORTS
(FAR 52.222-22) (APR 1984)

The offeror represents that--

(a) It () has, () has not participated in a previous contract or subcontract subject either to the Equal Opportunity clause of this solicitation, the clause originally contained in Section 310 of Executive Order No. 10925, or the clause contained in Section 201 of Executive Order No. 11114;

(b) It () has, () has not filed all required compliance reports; and

(c) Representations indicating submission of required compliance reports, signed by proposed subcontractors, will be obtained before subcontract awards.

(End of Provision)

K.12 AFFIRMATIVE ACTION COMPLIANCE
(FAR 52.222-25) (APR 1984)

The offeror represents that--

(a) It () has developed and has on file, () has not developed and does not have on file, at each establishment, affirmative action programs required by the rules and regulations of the Secretary of

Labor (41 CFR 60-1 and 60-2), or (b) It () has not previously had contracts subject to the written affirmative action programs requirement of the rules and regulations of the Secretary of Labor.

(End of Provision)

K.13 CLEAN AIR AND WATER CERTIFICATION
(FAR 52.223-1) (APR 1984)

The Offeror certifies that--

(a) Any facility to be used in the performance of this proposed contract is (), is not (x) listed on the Environmental Protection Agency List of Violating Facilities;

(b) The Offeror will immediately notify the Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the Offeror proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and

(c) The Offeror will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

(End of Provision)

K.14 CERTIFICATION REGARDING A DRUG-FREE WORKPLACE
(FAR 52.223-5) (MAR 1989)

(a) Definitions. As used in this provision, "Controlled substance" means a controlled substance in schedules I through V of section 202 of the Controlled Substances Act (21 U.S.C. 812) and as further defined in regulation at 21 CFR 1308.11-1308.15.

"Conviction" means a finding of guilt (including a plea of nolo contendere) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes.

"Criminal drug statute" means a Federal or non-Federal criminal statute involving the manufacture, distribution, dispensing, possession or use of any controlled substance.

"Drug-free workplace" means a site for the performance of work done in connection with a specific contract at which employees of the Contractor are prohibited from engaging in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance.

"Employee" means an employee of a Contractor directly engaged in the performance of work under a Government contract.

"Individual" means an offeror/contractor that has no more than one employee including the offeror/contractor.

(b) By submission of its offer, the offeror, if other than an individual, who is making an offer that equals or exceeds \$25,000, certifies and agrees, that with respect to all employees of the offeror to be employed under a contract resulting from this solicitation, it will-

(1) Publish a statement notifying such employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's workplace and specifying the actions that will be taken against employees for violations of such prohibition;

(2) Establish a drug-free awareness program to inform such employees about-

(i) The dangers of drug abuse in the workplace;

(ii) The Contractor's policy of maintaining a drug-free workplace;

(iii) Any available drug counseling, rehabilitation, and employee assistance programs; and

(iv) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;

(3) Provide all employees engaged in performance of the contract with a copy of the statement required by subparagraph (b)(1) of this provision;

(4) Notify such employees in the statement required by subparagraph (b)(1) of this provision, that as a condition of continued employment on the contract resulting from this solicitation, the employee will-

(i) Abide by the terms of the statement; and

(ii) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;

(5) Notify the contracting officer within ten (10) days after receiving notice under subdivision (b)(4)(ii) of this provision, from an employee or otherwise receiving actual notice of such conviction; and

(6) Within 30 days after receiving notice under subparagraph (b)(4)(ii) of this provision of a conviction, impose the following sanctions or remedial measures on any employee who is convicted of drug abuse violations occurring in the workplace:

(i) Take appropriate personnel action against such

employee, up to and including termination; or

(11) Require such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Make a good faith effort to maintain a drug-free workplace through implementation of subparagraphs (b)(1) through (b)(6) of this provision.

(c) By submission of its offer, the offeror, if an individual who is making an offer of any dollar value, certifies and agrees that the offeror will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in the performance of the contract resulting from this solicitation.

(d) Failure of the offeror to provide the certification required by paragraph (b) or (c) of this provision, renders the offeror unqualified and ineligible for award. (See FAR 9.104-1(g) and 19.602-1(a)(2)(1).)

(e) In addition to other remedies available to the Government, the certification in paragraphs (b) and (c) of this provision concerns a matter within the jurisdiction of an agency of the United States and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code, Section 1001.

(End of Clause)

K.15 NOTICE OF RESTRICTIONS ON CONTRACTING WITH
SANCTIONED PERSONS (FAR 52.225-12) (MAY 1989)

(a) Statutory prohibitions have been imposed on contracting with sanctioned persons, as specified in Federal Acquisition Regulation (FAR) 52.225-13, Restrictions on Contracting with Sanctioned Persons.

(b) By submission of this offer, the Offeror represents that no products or services, except those listed in this paragraph (b), delivered to the Government under any contract resulting from this solicitation will be products or services of a sanctioned person, as defined in the clause referenced in paragraph (a) of this provision, unless one of the exceptions in paragraph (d) of the clause at FAR 52.225-13 applies.

Product or service

Sanctioned person

(List as necessary)

(End of Clause)

N/A

K.16 COST ACCOUNTING STANDARDS NOTICES AND
CERTIFICATION (NONDEFENSE) (FAR 52.230-2) (SEP 1987)

NOTE: This notice does not apply to small businesses or foreign governments.

(a) Any contract over \$100,000 resulting from this solicitation shall be subject to Cost Accounting Standards (CAS) if it is awarded to a business unit that is currently performing a national defense CAS-covered contract or subcontract, except when--

(1) The award is based on adequate price competition;

(2) The price is set by law or regulation;

(3) The price is based on established catalog or market prices of commercial items sold in substantial quantities to the general public; or

(4) One of the exemptions in Federal Acquisition Regulation (FAR) 30.201-1(b) applies.

(b) Contracts not exempted from CAS shall be subject to full or modified coverage as follows:

(1) If the business unit receiving the award is currently performing a national defense contract or subcontract subject to full CAS coverage FAR 30.201-2(a), this contract will have full CAS coverage and will contain the clauses from the FAR entitled Cost Accounting Standards, 52.230-3 and Administration of Cost Accounting Standards, 52.230-4.

(2) If the business unit receiving the award is currently performing a national defense contract or subcontract subject to modified CAS coverage FAR 30.201-2(b), this contract will have modified coverage and will contain the clauses entitled Disclosure and Consistency of Cost Accounting Practices, 52.230-5 and Administration of Cost Accounting Standards, 52.230-4.

A. Certificate of CAS Applicability

The offeror hereby certifies that--

() The offeror is not performing any CAS-covered national defense contract or subcontract. The offeror further certifies that it will immediately notify the Contracting Officer in writing if it is awarded any national defense CAS-covered contract or subcontract subsequent to the date of this certificate but before the date of the award of a contract resulting from this solicitation. (If this statement applies, no further certification is required.)

() The offeror is currently performing a negotiated national defense contract or subcontract that contains the Cost Accounting Standards clause at FAR 52.230-3.

() The offeror is currently performing a negotiated national defense contract or subcontract that contains the Disclosure and Consistency of Cost Accounting Practices clause at FAR 52.230-5.

B. Additional Certification--CAS Applicable Offerors

() The offeror subject to Cost Accounting Standards further certifies that practices used in estimating costs in pricing this proposal are consistent with the practices disclosed in the Disclosure Statement where it has been submitted as required by FAR 30.202-1 through 30.202-5.

C. Data Required--CAS Covered Offerors

The offeror certifying that it is currently performing a national defense contract containing either CAS clause (see A above) is required to furnish the name, address (including agency or department component), and telephone number of the cognizant Contracting Officer administering the offeror's CAS-covered contracts.

Name of Contracting Officer: _____

Address: _____

Telephone Number: _____

(End of Provision)

K.17 ORGANIZATIONAL CONFLICTS OF INTEREST (JUNE 1988)

I represent to the best of my knowledge and belief that:

The award to Colorado State University of a contract or the modification of an existing contract does /___/ or does not /x/ involve situations or relationships of the type set forth in 41 CFR 20-1.5403(b)(1).

(End of Provision)

K.18 CERTIFICATION REGARDING DEBARMENT STATUS (JUNE 1988)

The offeror hereby certifies by submission of this offer that it and any subcontractor(s) that will be performing under this contract is not a debarred person or firm.

(End of Provision)

K.19 QUALIFICATIONS OF CONTRACT EMPLOYEES (JUNE 1988)

The offeror hereby certifies by submission of this offer that all representations made regarding its employees, proposed subcontractor personnel and consultants are accurate.

(End of Provision)

K.20 CURRENT/FORMER AGENCY EMPLOYEE INVOLVEMENT (JUNE 1988)

The following representation is required for NRC information and evaluation purposes only. It is not NRC policy to encourage offerors and contractors to propose current/former Agency employees to perform work under NRC contracts.

The offeror hereby certifies that there () are (x) are not current/former NRC employees who have been or will be involved, directly or indirectly, in developing the offer, or in negotiating on behalf of the offeror, or in managing, administering or performing any contract, consultant agreement or subcontract resulting from this offer. For each individual so identified, the Technical and Management proposal contains as a separate attachment the name, title, date individual left NRC and a brief description of the individual's role under this proposal.

(End of Provision)

K.21 CERTIFICATION AND DISCLOSURE REGARDING PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS (FAR 52.203-11) (JAN 1990)

(a) The definitions and prohibitions contained in the clause, at FAR 52.203-12, Limitation on Payments to Influence Certain Federal Transactions, included in this solicitation, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The offeror, by signing its offer, hereby certifies, to the best of his or her knowledge and belief as of December 23, 1989, that--

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan, or cooperative agreement;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or

an employee of a Member of Congress on his or her behalf in connection with this solicitation, the offeror shall complete and submit, with its offer, OMB Standard Form LLL, Disclosure of Lobbying Activities, to the Contracting Officer; and

(3) He or she will include the language of this certification in all subcontract awards at any tier and require that all recipients of subcontract awards in excess of \$100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than \$10,000, and not more than \$100,000, for each such failure.

(End of Provision)

REVISED 8/89

BILLING INSTRUCTIONS FOR
COST-REIMBURSEMENT TYPE CONTRACTS

General: The contractor shall prepare vouchers/invoices for reimbursement of costs in the manner and format described herein. A sample voucher/invoice is provided for your reference. FAILURE TO SUBMIT VOUCHERS/INVOICES IN ACCORDANCE WITH THESE INSTRUCTIONS WILL RESULT IN REJECTION OF THE VOUCHER/INVOICE AS IMPROPER.

Number of Copies: An original and three copies, including supporting documentation shall be submitted. A copy of all supporting documents must be attached to each copy of your voucher/invoice. Failure to submit all the required copies will result in rejection of the voucher/invoice as improper.

Designated Agency Billing Office: Vouchers/invoices shall be submitted to the following address:

U. S. Nuclear Regulatory Commission
Division of Contracts and Property Management
Contract Administration Branch, P-902
Washington, D.C. 20555

HAND DELIVERY OF VOUCHERS/INVOICES IS DISCOURAGED AND WILL NOT EXPEDITE PROCESSING BY NRC. However, should you choose to deliver vouchers/invoices by hand, including delivery by any express mail services or special delivery services which use a courier or other person to deliver the voucher/invoice in person to the NRC, such vouchers/invoices must be addressed to the above Designated Agency Billing Office and will only be accepted at the following location:

U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Room
Rockville, Maryland 20852

HAND-CARRIED SUBMISSIONS WILL NOT BE ACCEPTED AT OTHER THAN THE ABOVE ADDRESS.

Note that the official receipt date for hand-delivered vouchers/invoices will be the date it is received by the official agency billing office in the Division of Contracts and Property Management.

Agency Payment Office: Payment will continue to be made by the office designated in the contract in Block 22 of SF 26 or Block 25 of SF 33, whichever is applicable.

Frequency: The contractor shall submit claims for reimbursement once each month, unless otherwise authorized by the Contracting Officer.

Form: Claims should be submitted in the format depicted on the attached sample form entitled "Voucher for Purchases and Services Other than Personal." The sample form is provided for guidance only. The form is not required for submission of a voucher/invoice. Alternate formats are permissible provided all requirements of the billing instructions are addressed. Additional copies of the form are available from the Contracting Officer. The instructions for preparation and itemization of the voucher/invoice are included with the sample form.

Task Ordering Contracts: If the contractor bills for more than one task order under a voucher/invoice, detailed cost information for each individual task order shall be submitted, together with a cumulative summary of all charges billed on the voucher/invoice. This includes all applicable cost elements discussed in paragraphs (a) through (p) of the attached instructions, together with appropriate supporting information.

Billing of Cost After Expiration of Contract: If costs are incurred during the contract period and claimed after the contract has expired, the period during which these costs were incurred must be cited. To be considered a proper expiration voucher/invoice, contractor shall clearly mark it "EXPIRATION VOUCHER" or "EXPIRATION INVOICE."

Final vouchers/invoices shall be marked "FINAL VOUCHER" or "FINAL INVOICE."

Currency: Billings may be expressed in the currency normally used by the contractor in maintaining his accounting records; payments will be made in that currency. However, the U. S. dollar equivalent for all vouchers/invoices paid under the contract may not exceed the total U. S. dollars authorized in the contract.

Supersession: These instructions supersede any previous billing instructions.

Official Agency Billing Office
U. S. Nuclear Regulatory Commission
Division of Contracts and Property
Management, P-902
Washington, D.C. 20555
Payee's Name and Address

Individual to Contact
Regarding This Voucher:
Name: _____
Tel. No.: _____

(a) Contract Number _____
Task Order No. (If Applicable) _____
(b) Title of Project _____
(c) Voucher Number _____
(d) Project Officer _____
(e) Date of Voucher _____
(f) Contract Amount _____
(g) Fixed Fee _____

(h) This voucher represents reimbursable costs from _____ thru _____

Amount Billed

(l) Current Period (m) Inception to Date

	(l) Current Period	(m) Inception to Date
(i) Direct Costs		
1 Direct Labor *		
2 Fringe benefits <u> </u> % if computed as percentage		
3 Capitalized Nondepreciable Equipment *		
4 Materials, Supplies and Noncapitalized Equipment *		
5 Premium pay		
6 Consultants *		
7 Travel - Domestic *		
Foreign *		
8 Subcontract *		
9 Other Costs *		

Total Direct Costs _____

(j) <u>INDIRECT COSTS</u>		
A) Overhead <u> </u> % of _____ (Indicate Base)		
Subtotal		
B) General & Administrative Expense <u> </u> % of Cost Elements Nos. _____		
Total Costs		

(k) FIXED-FEE EARNED (Formula)		
(n) Total Amounts Claimed		
(o) Adjustments Outstanding Suspensions		
(p) Grand Totals		

*(REQUIRES SUPPORTING INFORMATION--SEE ATTACHED)

Instruction for Itemization of Costs and Supporting Information:

Preparation and Itemization of the Voucher/Invoice: In order to constitute a proper invoice, the contractor shall furnish all the information set forth below. These notes are keyed to the entries on the sample voucher/invoice.

Payee's name and address: Show the name of the contractor as it appears in the contract and its correct address. When an approved assignment has been made by the contractor, or a different payee or addressee has been designated, insert the name and address of the payee. Indicate the name and telephone number of the individual responsible for answering any questions that the NRC may have regarding the invoice.

- (a) Contract Number. Insert the NRC contract number
Task Order Number, if applicable. Insert the task order number.
- (b) Title of Project. List the full title of the project being performed under the contract.
- (c) Sequential voucher/invoice number. The appropriate sequential number of the voucher/invoice, beginning with 001 should be designated. Contractors may also include individual internal accounting numbers, if desired, in addition to the 3-digit sequential number.
- (d) Project Officer's name and mailstop as designated in the contract.
- (e) Date of voucher/invoice. Insert the date the voucher/invoice is prepared.
- (f) Contract Amount. Insert the total estimated cost of the contract, exclusive of fixed-fee. Include this information as it applies to individual task orders as well.
- (g) Fixed-Fee. Insert total fixed-fee. Include this information as it applies to individual task orders as well.
- (h) Billing Period. Insert the beginning and ending dates (day, month, year) of the period during which costs were incurred and for which reimbursement is claimed.
- (i) Direct Costs. Insert the major cost elements:
 - (1) Direct Labor. This consists of salaries and wages paid (or accrued) for direct performance of the contract itemized as follows:

Labor Category	Labor Hrs. Negotiated	Hours Billed	Rate	Total	Cumulative Hours Billed
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- (2) Fringe Benefits. This represents fringe benefits applicable to direct labor and billed as a direct cost. Where a rate is used, indicate the rate. Fringe benefits included in direct labor or in other indirect cost pools should not be identified here.
- (3) Direct Equipment. For educational institutions, list each item costing \$500.00 or more and having a life expectancy of more than one year. For contractors other than educational institutions, list each item costing \$200.00 or more and having a life expectancy of more than one year. List only those items of equipment for which reimbursement is requested. A reference shall be made to the following (as applicable): (a) the item number for the specific piece of equipment listed in the property schedule of the contract; (b) the Contracting Officer's approval letter if the equipment is not covered by the property schedule; or (c) be preceded by an asterisk (*) if the equipment is below the approval level. Further itemization of vouchers/invoices shall only be required for items having specific limitations set forth in the contract.
- (4) Materials, Supplies, or Other Expendable Items. These are consumable materials, supplies, and equipment other than that described in (3) above.
- (5) Premium Pay. This is remuneration in excess of the basic hourly rate. (Requires written approval of the Contracting Officer.)
- (6) Consultant's Fee. The supporting information must include the name, hourly or daily rate of the consultant, and reference the NRC approval (if not specifically approved in the original contract).
- (7) Travel. Domestic travel is travel within the United States, its territories, possessions, and Canada. It should be billed separately from foreign travel.

All costs associated with each trip must be shown in the following format:

Date	Traveler	Destination	Purpose	Cost
From To		From To		\$

- (8) Subcontracts. Include separate detailed breakdown of all costs paid to approved subcontractors during the billing period.
- (9) Other. List all other direct costs by cost element and dollar amount separately.
- (j) Indirect Costs - Overhead. Cite the formula (rate and base) in effect during the time the cost was incurred and for which reimbursement is claimed.
- (k) Fixed Fee. If the contract provides for a fixed fee, it must be claimed as provided for by the contract. Cite the formula or method of computation. The contractor may bill for fixed fee only up to 85% of total fee.
- (l) Amount Billed for Current Period. Insert the amount billed for the major cost elements, adjustments, and total amount for the period.
- (m) Cumulative Amount from Inception to Date of Current Billing. Insert the cumulative amounts billed for the major cost elements and adjusted amounts claimed during this contract.
- (n) Total Amounts Claimed. Insert the total amounts claimed for the current and cumulative periods.
- (o) Adjustments. This includes cumulative amounts billed that have been suspended or disallowed.
- (p) Grand Totals.
- (*) Supporting Information. Cost elements requiring detailed supporting information--sample attached.

Supporting Information - Sample

1) Direct Labor - \$2400

<u>Labor Category</u>	<u>Labor Hours Negotiated</u>	<u>Hours Billed</u>	<u>Rate</u>	<u>Total</u>	<u>Cumulative Hours Billed</u>
Senior Engineer I	2400	100	\$14.00	\$1400	975
Engineer	1500	50	\$10.00	\$500	465
Computer Analyst	700	100	\$5.00	\$500	320
				<u>\$2400</u>	

3) Direct Equipment

Spectrometer - General Electric (as approved in Property Schedule) \$5,000

4) Materials, Supplies & Other Expendable Items

10 Radon Tubes @ \$110.00 = \$1100.00
 6 Pairs Electrostatic Gloves @ \$150.00 = \$900.00
\$2000.00

5) Premium Pay

Walter Munny - 10 hours @ \$10.00 Per Hour = \$100
 (This was approved by WRC in letter dated 2/6/89.)

6) Consultants' Fee

Dr. Carney - 1 hour @ \$100 = \$100

7) Travel

<u>Date</u>		<u>Traveler</u>	<u>Destination</u>		<u>Purpose</u>	<u>Costs</u>
<u>From</u>	<u>To</u>		<u>From</u>	<u>To</u>		
3/1/89	3/6/89	William King	Chicago, IL	Wash., DC	Meeting with Project Officer	\$200

8) Subcontracts

XYZ CORP. (CPFF)

Direct Labor:	- 80 hours @ \$20.00 per hour	= \$1600.00
O/H	@ 50%	= \$800.00
Travel - 2 Trips - Wash., DC to Boston, MA	@ \$200	= \$400.00
Profit	@ 7%	= \$200.00
TOTAL:		<u>\$3000.00</u>

(k) Fixed-Fee (Formula)

(5%)

\$350,000 X 5% = \$17,500 Total Fixed Fee for this Contract

\$27,200 X 5% = \$1360 Fee Billed for this Period

(c) Adjustments

\$1700 - Indicates amount withheld from voucher #001, now approved by Contracting Officer letter 3/10/89.

PART 20-1 -- GENERAL

Subpart 20-1.54--Contractor Organizational Conflicts of Interest

Sec.	
20-1.5401	Scope and policy.
20-1.5402	Definitions.
20-1.5403	Criteria for recognizing contractor organizational conflicts of interest.
20-1.5404	Representation.
20-1.5405	Contract clauses.
20-1.5405-1	General contract clause.
20-1.5405-2	Special contract provisions.
20-1.5406	Evaluation, findings, and contract award.
20-1.5407	Conflicts identified after award.
20-1.5408	(Reserved)
20-1.5409	(Reserved)
20-1.5410	Subcontractors.
20-1.5411	Waiver.
20-1.5412	Remedies.

AUTHORITY: Sec. 8, Pub. L. 95-601, adding Sec. 170A to Pub. L. 83-703, 68 Stat. 919, as amended (42 U.S.C. ch. 14)

§20-1.5401 Scope and Policy.

(a) It is the policy of the U.S. Nuclear Regulatory Commission (NRC) to avoid, eliminate or neutralize contractor organizational conflicts of interest. The NRC achieves this objective by requiring all prospective contractors to submit information describing relationships, if any, with organizations or persons (including those regulated by NRC) which may give rise to actual or potential conflicts of interest in the event of contract award.

(b) Contractor conflict of interest determinations cannot be made automatically or routinely; the application of sound judgment on virtually a case-by-case basis is necessary if the policy is to be applied so as to satisfy the overall public interest. It is not possible to prescribe in advance a specific method or set of criteria which would serve to identify and resolve all of the contractor conflict of interest situations which might arise; however, examples are provided in these regulations to guide application of the policy. NRC contracting and program officials must be alert to other situations which may warrant application of this policy guidance. The ultimate test is: Might the contractor, if awarded the contract, be placed in a position where its judgment may be biased, or where it may have an unfair competitive advantage?

(c) The conflict of interest rule contained in this subpart applies to contractors and offerors only. Individuals or firms who have other relationships with NRC (e.g., parties to a licensing proceeding) are not covered by this regulation. This rule does not apply to the acquisition of consulting services through the personnel appointment process, NRC

agreements with other government agencies, international organizations, or state, local or foreign governments; separate procedures for avoiding conflicts of interest will be employed in such agreements, as appropriate.

20-1.5402 Definitions

(a) "Organizational conflicts of interest" means that a relationship exists whereby a contractor or prospective contractor has present or planned interests related to the work to be performed under an NRC contract which: (1) May diminish its capacity to give impartial, technically sound, objective assistance and advice or may otherwise result in a biased work product, or (2) may result in its being given an unfair competitive advantage.

(b) "Research" means any scientific or technical work involving theoretical analysis, exploration, or experimentation.

(c) "Evaluation activities" means any effort involving the appraisal of a technology, process, product, or policy.

(d) "Technical consulting and management support services" means internal assistance to a component of the NRC in the formulation or administration of its programs, projects, or policies which normally require the contractor to be given access to information which has not been made available to the public or proprietary information. Such services typically include assistance in the preparation of program plans; and preparation of preliminary designs, specifications, or statements of work.

(e) "Contract" means any contract, agreement, or other arrangement with the NRC except as provided in Section 20-1.5401(c).

(f) "Contractor" means any person, firm, unincorporated association, joint venture, co-sponsor, partnership, corporation, affiliates thereof, or their successors in interest, including their chief executives, directors, key personnel (identified in the contract), proposed consultants or subcontractors, which is a party to a contract with the NRC.

(g) "Affiliates" means business concerns which are affiliates of each other when either directly or indirectly one concern or individual controls or has the power to control another, or when a third party controls or has the power to control both (41 CFR 1-1.606-1(e)).

(h) "Subcontractor" means any subcontractor of any tier which performs work under a contract with the NRC except subcontracts for supplies and subcontracts in amounts of \$10,000 or less.

(i) "Prospective contractor" or "offeror" means any person, firm, unincorporated association, joint venture, partnership, corporation, or affiliates thereof, including its chief executive, directors, key personnel (identified in the proposal), proposed consultants, or subcontractors, submitting a bid or proposal, solicited or unsolicited, to the NRC to obtain a contract.

(j) "Potential conflict of interest" means that a factual situation exists that suggests (indicates) that an actual conflict of interest may arise from award of a proposed contract. The term "potential conflict of interest" is used to signify those situations which merit investigation prior to contract award in order to ascertain whether award would give rise to an actual conflict or which must be reported to the contracting officer for investigation if they arise during contract performance.

§ 20-1.5403 Criteria for recognizing contractor organizational conflicts of interest

(a) General. Two questions will be asked in determining whether actual or potential organizational conflicts of interest exist: (1) Are there conflicting roles which might bias a contractor's judgment in relation to its work for the NRC? (2) May the contractor be given an unfair competitive advantage based on the performance of the contract? The ultimate determination by NRC as to whether organizational conflicts of interest exist will be made in light of common sense and good business judgment based upon the relevant facts disclosed and the work to be performed. While it is difficult to identify and to prescribe in advance a specific method for avoiding all of the various situations or relationships which might involve potential organizational conflicts of interest, NRC personnel will pay particular attention to proposed contractual requirements which call for the rendering of advice, consultation or evaluation activities or similar activities that lay direct groundwork for the NRC's decisions on regulatory activities, future procurements, and research programs.

(b) Situations or relationships which may give rise to organizational conflicts of interest. (1) The offeror or contractor shall disclose information concerning relationships which may give rise to organizational conflicts of interest under the following circumstances:

(i) Where the offeror or contractor provides advice and recommendation to the NRC in a technical area in which it is also providing consulting assistance in the same area to any organization regulated by the NRC.

(ii) Where the offeror or contractor provides advice to the NRC on the same or similar matter in which it is also providing assistance to any organization regulated by the NRC.

(iii) Where the offeror or contractor evaluates its own products or services, or the products or services of another entity where the offeror or contractor has been substantially involved in their development or marketing.

(iv) Where the award of a contract would otherwise result in placing the offeror or contractor in a conflicting role in which its judgment may be biased in relation to its work for the NRC or may otherwise result in an unfair competitive advantage for the offeror or contractor.

(2) The contracting officer may request specific information from an offeror or contractor or may require special contract provisions such as provided in 120-1.5405-2 in the following circumstances:

(i) Where the offeror or contractor prepares specifications which are to be used in competitive procurements of products or services covered by such specifications.

(ii) Where the offeror or contractor prepares plans for specific approaches or methodologies that are to be incorporated into competitive procurements using such approaches or methodologies.

(iii) Where the offeror or contractor is granted access to information not available to the public concerning NRC plans, policies, or programs which could form the basis for a later procurement action.

(iv) Where the offeror or contractor is granted access to proprietary information of its competitors.

(v) Where the award of a contract might otherwise result in placing the offeror or contractor in a conflicting role in which its judgment may be biased in relation to its work for the NRC or may otherwise result in an unfair competitive advantage for the offeror or contractor.

(c) Policy application guidance. The following examples are illustrative only and are not intended to identify and resolve all contractor organizational conflict of interest situations. (1) Example. The XYZ Corp., in response to a request for proposal (RFP), proposes to undertake certain analyses of a reactor component as called for in the RFP. The XYZ Corp. is one of several companies considered to be technically well qualified. In response to the inquiry in the RFP, the XYZ Corp. advises that it is currently performing similar analyses for the reactor manufacturer.

Guidance. An NRC contract for that particular work normally would not be awarded to the XYZ Corp. because it would be placed in a position in which its judgment could be biased in relationship to its work for NRC. Since there are other well-qualified companies available, there would be no reason for considering a waiver of the policy.

(2) Example. The ABC Corp., in response to a RFP, proposes to perform certain analyses of a reactor component which are unique to one type of advanced reactor. As is the case with other technically qualified companies responding to the RFP, the ABC Corp. is performing various projects for several different utility clients. None of the ABC Corp. projects have any relationship to the work called for in the RFP. Based on the NRC evaluation, the ABC Corp. is considered to be the best qualified company to perform the work outlined in the RFP.

Guidance. An NRC contract normally could be awarded to the ABC Corp. because no conflict of interest exists which would motivate bias with respect to the work. An appropriate clause would be included in the contract to preclude the ABC Corp. from subsequently contracting for work during the performance of the NRC contract with the private sector which could create a conflict. For example, ABC Corp. would be precluded from the performance of similar work for the company developing the advanced reactor mentioned in the example.

(3) Example. As a result of operating problems in a certain type of commercial nuclear facility, it is imperative that NRC secure specific data on various operational aspects of that type of plant so as to assure adequate safety protection of the public. Only one manufacturer has extensive experience with that type of plant. Consequently, that company is the only one with whom NRC can contract which can develop and conduct the testing programs required to obtain the data in reasonable time. That company has a definite interest in any NRC decisions that might result from the data produced because those decisions affect the reactor's design and thus the company's costs.

Guidance. This situation would place the manufacturer in a role in which its judgment could be biased in relationship to its work for NRC. Since the nature of the work required is vitally important in terms of NRC's responsibilities and no reasonable alternative exists, a waiver of the policy may be warranted. Any such waiver shall be fully documented and coordinated in accordance with the waiver provisions of this policy with particular attention to the establishment of protective mechanisms to guard against bias.

(4) Example. The ABC Co. submits a proposal for a new system for evaluating a specific reactor component's performance for the purpose of developing standards that are important to the NRC program. The ABC Co. has advised NRC that it intends to sell the new system to industry once its practicability has been demonstrated. Other companies in this business are using older systems for evaluation of the specific reactor component.

Guidance. A contract could be awarded to the ABC Co. provided that the contract stipulates that no information produced under the contract will be used in the contractor's private activities unless such information has been reported to NRC. Information which is reported to NRC by contractor will normally be disseminated by NRC to others so as to preclude an unfair competitive advantage that might otherwise accrue. When NRC furnishes information to the contractor for the performance of contract work, it shall not be used in the contractor's private activities unless such information is generally available to others. Further, the contract will stipulate that the contractor will inform the NRC contracting officer of all situations in which the information developed under the contract is proposed to be used.

(5) Example. The ABC Corp., in response to a RFP proposes to assemble a map showing certain seismological features of the Appalachian fold belt. In accordance with the representation in the RFP and 120-1.5403(b)(1)(i), ABC Corp. informs the NRC that it is presently doing seismological studies for several utilities in the Eastern United States but none of the sites are within the geographic area contemplated by the NRC study.

Guidance. The contracting officer would normally conclude that award of a contract would not place ABC Corp. in a conflicting role where its judgment might be biased. The work for others clause of 120-1.5405-1(c) would preclude ABC Corp. from accepting work during the term of the NRC contract which could create a conflict of interest.

(d) Other considerations. (1) The fact that the NRC can identify and later avoid, eliminate, or neutralize any potential organizational conflicts arising from the performance of a contract is not relevant to a determination of the existence of such conflicts prior to the award of a contract.

(2) It is not relevant that the contractor has the professional reputation of being able to resist temptations which arise from organizational conflicts of interest, or that a follow-on procurement is not involved, or that a contract is awarded on a competitive or a sole source basis.

120-1.5404 Representation

(a) The following procedures are designed to assist the NRC contracting officer in determining whether situations or relationships exist which may constitute organizational conflicts of interest with respect to a particular offeror or contractor.

(b) Representation procedure. The following organizational conflicts of interest representation provision shall be included in all solicitations and unsolicited proposals for: (1) Evaluation services or activities; (2) technical consulting and management support services; (3) research; and (4) other contractual situations where special organizational conflicts of interest provisions are noted in the solicitation and would be included in the resulting contract. This representation requirement shall also apply to all modifications for additional effort under the contract except those issued under the "changes" clause. Where, however, a statement of the type required by the organizational conflicts of interest representation provision has previously been submitted with regard to the contract being modified, only an updating of such statement shall be required.

ORGANIZATIONAL CONFLICTS OF INTEREST REPRESENTATION

I represent to the best of my knowledge and belief that:

The award to _____ of a contract or the modification of an existing contract does () or does not () involve situations or relationships of the type set forth in 41 CFR §20-1.5403(b)(1).

(c) Instructions to offerors. The following shall be included in all NRC solicitations: (1) If the representation as completed indicates that situations or relationships of the type set forth in 41 CFR §20-1.5403(b)(1) are involved, or the contracting officer otherwise determines that potential organizational conflicts exist, the offeror shall provide a statement in writing which describes in a concise manner all relevant facts bearing on his representation to the contracting officer. If the contracting officer determines that organizational conflicts exist, the following actions may be taken: (i) Impose appropriate conditions which avoid such conflicts, (ii) disqualify the offeror, or (iii) determine that it is otherwise in the best interest of the United States to seek award of the contract under the waiver provisions of §20-1.5411.

(2) The refusal to provide the representation required by §20-1.5404(b) or upon request of the contracting officer the facts required by §20-1.5404(c), shall result in disqualification of the offeror for award. The nondisclosure or misrepresentation of any relevant interest may also result in the disqualification of the offeror for award; or if such nondisclosure or misrepresentation is discovered after award, the resulting contract may be terminated. The offeror may also be disqualified from subsequent related NRC contracts and be subject to such other remedial actions provided by law or the resulting contract.

(d) The offeror may, because of actual or potential organizational conflicts of interest, propose to exclude specific kinds of work from the statements of work contained in a RFP unless the RFP specifically prohibits such exclusion. Any such proposed exclusion by an offeror will be considered by the NRC in the evaluation of proposals. If the NRC considers the proposed excluded work to be an essential or integral part of the required work and its exclusion would work to the detriment of the competitive posture of the other offerors, the proposal must be rejected as unacceptable.

(e) The offeror's failure to execute the representation required by subsection (b) above with respect to invitation for bids will be considered to be a minor informality, and the offeror will be permitted to correct the omission.

§ 20-1.5405 Contract clauses

§ 20-1.5405-1 General contract clause

All contracts of the types set forth in §20-1.5404(b) shall include the following clauses:

(a) Purpose. The primary purpose of this clause is to aid in ensuring that the contractor: (1) is not placed in a conflicting role because of current or planned interest (financial, contractual, organization or otherwise) which relate to the work under this contract, and (2) does not obtain an unfair competitive advantage over other parties by virtue of its performance of this contract.

(b) Scope. The restrictions described herein shall apply to performance or participation by the contractor as defined in 41 CFR §20-1.5402(f) in the activities covered by this clause.

(c) Work for others. Notwithstanding any other provision of this contract, during the term of this contract, the contractor agrees to forego entering into consulting or other contractual arrangements with any firm or organization, the result of which may give rise to a conflict of interest with respect to the work being performed under this contract. The contractor shall ensure that all employees who are employed full time under this contract and employees designated as key personnel, if any, under this contract abide by the provision of this clause. If the contractor believes with respect to itself or any such employee that any proposed consultant or other contractual arrangement with any firm or organization may involve a potential conflict of interest, the contractor shall obtain the written approval of the contracting officer prior to execution of such contractual arrangement.

(d) Disclosure after award. (1) The contractor warrants that to the best of its knowledge and belief and except as otherwise set forth in this contract, it does not have any organizational conflicts of interest, as defined in 41 CFR §20-1.5402(a).

(2) The contractor agrees that if after award it discovers organizational conflicts of interest with respect to this contract, it shall make an immediate and full disclosure in writing to the contracting officer. This statement shall include a description of the action which the contractor has taken or proposes to take to avoid or mitigate such conflicts. The NRC may, however, terminate the contract for convenience if it deems such termination to be in the best interests of the government.

(e) Access to and use of information. (1) If the contractor in the performance of this contract obtains access to information, such as NRC plans, policies, reports, studies, financial plans, internal data protected by the Privacy Act of 1974 (Pub. L. 93-579), or data which has not been released to the public, the contractor agrees not to: (1) Use such information for any private purpose until the information has been released to the public; (11) compete for work for the Commission based

on such information for a period of six (6) months after either the completion of this contract or the release of such information to the public, whichever is first, (iii) submit an unsolicited proposal to the government based on such information until one year after the release of such information to the public, or (iv) release the information without prior written approval by the contracting officer unless such information has previously been released to the public by the NRC.

(2) In addition, the contractor agrees that to the extent it receives or is given access to proprietary data, data protected by the Privacy Act of 1974 (Pub. L. 93-579), or other confidential or privileged technical, business, or financial information under this contract, the contractor shall treat such information in accordance with restrictions placed on use of the information.

(3) The contractor shall have, subject to patent and security provisions of this contract, the right to use technical data it produces under this contract for private purposes provided that all requirements of this contract have been met.

(f) Subcontracts. Except as provided in 41 CFR §20-1.5402(h), the contractor shall include this clause, including this paragraph, in subcontracts of any tier. The terms "contract," "contractor," and "contracting officer," shall be appropriately modified to preserve the government's rights.

(g) Remedies. For breach of any of the above proscriptions or for intentional nondisclosure or misrepresentation of any relevant interest required to be disclosed concerning this contract or for such erroneous representations as necessarily imply bad faith, the government may terminate the contract for default, disqualify the contractor from subsequent contractual efforts, and pursue other remedies as may be permitted by law or this contract.

(h) Waiver. A request for waiver under this clause shall be directed in writing through the contracting officer to the Executive Director for Operations (EDO) in accordance with the procedures outlined in §20-1.5411.

§20-1.5405-2 Special contract provisions.

(a) If it is determined from the nature of the proposed contract that organizational conflicts of interest exist, the contracting officer may determine that such conflict can be avoided or after obtaining a waiver in accordance with §20-1.5411, neutralized through the use of an appropriate special contract provision. If appropriate, the offeror may negotiate the terms and conditions of these clauses, including the extent and time period of any such restriction. These provisions include but are not limited to:

(1) Hardware exclusion clauses which prohibit the acceptance of production contracts following a related nonproduction contract previously performed by the contractor;

(2) Software exclusion clauses;

(3) Clauses which require the contractor (and certain of his key personnel) to avoid certain organizational conflicts of interest; and

(4) Clauses which provide for protection of confidential data and guard against its unauthorized use.

(b) The following additional contract clause may be included as section (f) in the clause set forth in § 20-1.5405-1 when it is determined that award of a follow-on contract would constitute an organizational conflict of interest.

(1) Follow-on effort. (1) The contractor shall be ineligible to participate in NRC contracts, subcontracts, or proposals therefor (solicited or unsolicited) which stem directly from the contractor's performance of work under this contract. Furthermore, unless so directed in writing by the contracting officer, the contractor shall not perform any technical consulting or management support services work or evaluation activities under this contract on any of its products or services or the products or services of another firm if the contractor has been substantially involved in the development or marketing of such products or services.

(2) If the contractor under this contract prepares a complete or essentially complete statement of work or specifications, the contractor shall be ineligible to perform or participate in the initial contractual effort which is based on such statement of work or specifications. The contractor shall not incorporate its products or services in such statement of work or specifications unless so directed in writing by the contracting officer, in which case the restriction in this subparagraph shall not apply.

(3) Nothing in this paragraph shall preclude the contractor from offering or selling its standard commercial items to the government.

§ 20-1.5406 Evaluation, findings, and contract award

The contracting officer will evaluate all relevant facts submitted by an offeror pursuant to the representation requirements of § 20-1.5404(b) and other relevant information. After evaluating this information against the criteria of § 20-1.5403, a finding will be made by the contracting officer whether organizational conflicts of interest exist with respect to a particular offeror. If it has been determined that conflicts of interest exist, then the contracting officer shall either:

(a) Disqualify the offeror from award,

- (b) Avoid or eliminate such conflicts by appropriate measures; or
- (c) Award the contract under the waiver provision of §20-1.5411.

§20-1.5407 Conflicts identified after award.

If potential organizational conflicts of interest are identified after award with respect to a particular contractor, the contracting officer determines that such conflicts do, in fact, exist and that it would not be in the best interests of the government to terminate the contract as provided in the clauses required by §20-1.5405, the contracting officer will take every reasonable action to avoid, eliminate, or, after obtaining a waiver in accordance with §20-1.5411, neutralize the effects of the identified conflict.

§20-1.5408 (Reserved)

§20-1.5409 (Reserved)

§20-1.5410 Subcontracts

The contracting officer shall require offerors and contractors to submit a representation statement in accordance with §20-1.5404(b) from subcontractors and consultants. The contracting officer shall require the contractor to include contract clauses in accordance with §20-1.5405 in consultant agreements or subcontracts involving performance of work under a prime contract covered by this subsection.

§20-1.5411 Waiver

In the first instance, determination with respect to the need to seek a waiver for specific contract awards shall be made by the contracting officer with the advice and concurrence of the program officer director and the Office of Executive Legal Director. Upon the recommendation of the contracting officer, and after consultation with the Office of the General Counsel, the EDO may waive the policy in specific cases if he determines that it is in the best interest of the United States to do so.

Such action shall be strictly limited to those situations in which:


- (1) The work to be performed under contract is vital to the NRC program;
- (2) the work cannot be satisfactorily performed except by a contractor whose interests give rise to a question of conflict of interest; and (3) contractual and/or technical review and supervision methods can be employed by NRC to neutralize the conflict. For any such waivers, the justification and approval documents shall be placed in the Public Document Room.

§20-1.5412 Remedies

In addition to such other remedies as may be permitted by law or contract for a breach of the restrictions in this subpart or for any intentional misrepresentation or intentional nondisclosure of any relevant interest required to be provided for this section, the NRC may debar the contractor from subsequent NRC contracts.

Dated at Washington, D.C. this 27th day of March 1979.

For the Nuclear Regulatory Commission



Samuel J. Chilk
Secretary of the Commission

Form NRC-489
(1-76)U. S. NUCLEAR REGULATORY COMMISSION
NRC MANUAL
TRANSMITTAL NOTICECHAPTER NRC-3202 PUBLICATION OF TECHNICAL REPORTS PREPARED BY NRC
CONTRACTORS, INCLUDING REPORTS PREPARED UNDER
PURSUANT TO INTERAGENCY AGREEMENTS

SUPERSEDED:

	Number	Date
Chapter	NRC-3202	4/29/82
Page		
Appendix	NRC-3202	4/29/82

TRANSMITTED:

	Number	Date
TN	3200-21	
Chapter	NRC-3202	6/29/84
Page		
Appendix	NRC-3202	8/29/84

REMARKS:

This revision of Chapter 3202 expands the chapter from coverage of unclassified reports to include the marking and handling of sensitive unclassified information (Official Use Only and Limited Official Use Information, Safeguards Information, Proprietary Information) and classified information (Top Secret, Secret, and Confidential). A section has also been added to set forth procedures for the handling of unclassified reports on NRC cooperative programs with foreign governments and organizations and industry.

Publishers Note: 3/90 Delete Division of Technical Information & Document Control

Replace With: Division of Freedom of Information and Publication Services, Regulatory Publications Branch, Technical Publications Section, Tel.492-7086.

U.S. NUCLEAR REGULATORY COMMISSION
NRC MANUAL

Volume: 3000 Information and Foreign Activities
Part : 3200 Technical Information and Document Control

ADM

CHAPTER 3202 PUBLICATION OF TECHNICAL REPORTS PREPARED BY
NRC CONTRACTORS, INCLUDING REPORTS PREPARED
UNDER OR PURSUANT TO INTERAGENCY AGREEMENTS

3202-01 COVERAGE

This chapter and its appendix handbook establish responsibilities, basic requirements, standards and procedures for the documentation, production and dissemination of technical reports prepared by NRC consultants and grantees and by NRC contractors and their subcontractors, including reports prepared under or pursuant to interagency agreements or memorandums of understanding. These reports are hereafter referred to as contractor reports. This chapter does not cover NRC staff-generated documents, NRC docket material, or the documents generated by NRC boards, panels, advisory committees and Offices that report to the Commission.

3203-02 OBJECTIVES

021 to assure production and dissemination of technical reports as required by the Energy Reorganization Act of 1974 and the Freedom of Information Act.

022 to assure that dissemination of technical reports is consistent with requirements for public availability of information.

023 to assure that national security, patent rights, copyrights, proprietary rights and rights in other sensitive unclassified information are not compromised by the release, distribution, or dissemination of technical reports from NRC.

024 to assure that formal NRC contractor reports will carry the registered NRC designation NUREG/CR or NUREG/CP as the prime identification.

025 to provide for coordination of press or other media releases.

3202-03 RESPONSIBILITIES AND AUTHORITIES

031 The Director, Office of Administration:

- a. develops and maintains, in consultation with Directors of Offices and Divisions and Regional Administrators, NRC standards, procedures and guides for the production and dissemination of technical contractor reports.

Approved: August 29, 1984

- b. periodically surveys report activities throughout NRC to ascertain that the provisions of this chapter are adequate and are being implemented; makes any changes needed.

032 The Director, Division of Technical Information and Document Control:

- a. develops and administers a central report control system for identifying, printing and distributing contractor reports and responding to requests for unclassified reports.
- b. develops and maintains guides and standards for the documentation, formatting, printing, dissemination, and public sale of unclassified contractor reports.
- c. assures that a system exists for review of unclassified contractor reports for adherence to patent, copyright and disclosure policies prior to dissemination.
- d. establishes and administers interagency agreements necessary for the dissemination and public sale of unclassified contractor reports and controls duplication and printing of contractor reports to assure adherence to the Government Printing and Binding Regulations issued by the Joint Committee on Printing (JCP), Congress of the United States.
- e. in response to requests of Directors of Offices and Regional Administrators, establishes distribution data banks, maintains official standard distribution lists for automatic distribution of unclassified contractor reports, and controls distribution to assure adherence to the Government Printing and Binding Regulations, the Privacy Act, and the Freedom of Information Act.

033 Directors of Offices and Regional Administrators:

- a. establish the contract or Standard Order for Work* provisions, including those required by this chapter and its appendix; Chapter NRC-3203, Distribution of Unclassified NRC Staff- and Contractor-Generated Documents and its appendix; Chapter NRC-0260, Printing, Copying, Graphics and Photography and its appendix; and Chapter NRC-1102, Procedures for Placement of Work with the Department of Energy. In the Statement of Work:
- (1) specify what reports will be reviewed for policy, management, and legal issues by NRC staff in draft prior to printing and distribution. If the report is to be reviewed by NRC staff, give the conditions under which the contractor may publish documents in the event of unresolvable differences relative to the draft, including the type of disclaimer to be used in addition to the standard government disclaimer (see Exhibit 6).

* In the case of DOE work, this is NRC Form 173, Standard Order for DOE Work. See Chapter NRC-1102.

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- (2) provide for the reviews necessary to insure that the national security, patent rights, copyrights, proprietary rights and rights in other sensitive unclassified information are not compromised by the release or dissemination of the reports. If DOE contractors are to be authorized to make the reviews, designate the contractor officials who are authorized to sign NRC Form 426A prior to NRC distribution of reports (see Appendix, Part IV). Assure that sensitive unclassified and classified reports are marked and handled properly (see Appendix, Part V).
 - (3) specify that all formal reports carry NUREG/CR or NUREG/CP numbers as the prime identification, as illustrated in the appendix.
 - (4) specify whether formal reports shall be printed by NRC or the contractor if the contractor has a JCP-authorized federal printing plant (see Appendix, Parts II and IV).
 - (5) specify that all formal reports required by NRC shall be distributed by NRC.
 - (6) establish the number of copies the contractor may retain or request for internal and external distribution and charge against NRC. Written justification must be provided, and approval obtained of the NRC JCP representative (the Director, Division of Technical Information and Document Control) when the number exceeds the 50 copies authorized by JCP for unclassified reports.
 - (7) assure the protection of classified and sensitive unclassified information, if any, in contractor reports (see Appendix, Part V).
- b. assure adherence to instructions and authorizations regarding the reproduction and distribution of reports.
 - c. recommend standard distribution category(ies) for contractor reports to the Division of Technical Information and Document Control.
 - d. provide changes to the official standard distribution lists to the Division of Technical Information and Document Control.
 - e. establish procedures for review of contractor's proposed press and other media releases.

034 The Office of the Executive Legal Director provides legal review and advice to NRC staff on questions regarding inventions, patents, proprietary information, use of copyrighted material, national security, and other sensitive unclassified and classified information.

035 The Director, Office of Public Affairs, upon request of the project manager, reviews proposed contractor's press or other media releases for appropriateness.

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036 The Director, Division of Security:

- a. administers the overall information security program which includes management of the security classification program and other programs for the protection of sensitive unclassified information.
- b. advises staff of NRC Offices and Regions on the preparation and handling of reports containing classified, proprietary and other sensitive unclassified information.

037 The Director, Division of Contracts:

- a. coordinates the flow of -U reports to and from contractors (other than DOE contractors) where such reports may result in alterations in the terms and conditions of applicable contracts as they pertain to report production and distribution.
- b. advises the contractor as to the source and method for obtaining reports required from the government for performance of the contract.
- c. provides contractor with copies of NRC Chapters 0260, 3202, 3203, 3207, and 3210, when appropriate.
- d. determines when requests for proposals and invitations for bids, as well as subsequent contracts, should include statements requiring contractor compliance with Chapters NRC-3202, 3207, and 3210 and the Government Printing and Binding Regulations.
- e. ensures that appropriate clauses are included in contracts regarding the private use and protection of classified, proprietary and other sensitive unclassified information.

3202-04 DEFINITIONS*

author

041 camera-ready copy - pages ready for printing by the offset printing process. This is a colloquial term used even though the printing process may not involve the so-called copy camera (see also reproducible masters).

042 central report control system - means for developing and maintaining the policies, procedures and guides needed to identify and produce regulatory and technical reports and to assure adherence to requirements and standards for documentation, formatting, printing and distribution.

043 contractor report - record of work done (a report) prepared in accordance with the provisions of a contract or under or pursuant to an interagency agreement.

* Words underscored in definitions are also defined in list.

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044 copyright - a form of protection provided by the laws of the United States (Title 17, U.S. Code) to the authors of "original works of authorship" including literary, dramatic, musical, artistic, and certain other intellectual works. This protection is available to both published and unpublished works. Copyrighted material may not be reproduced without the permission of the author or publisher.

045 disseminate - to announce the publication of reports and make them available for free distribution, sale or copying.

046 distribute - to dispense reports to specific organizations and individuals to assure their participation in the regulatory process and support of research and technological investigations. Such distribution may be accomplished by the use of standard distribution data banks established and maintained by the Division of Technical Information and Document Control based on the requests of the originating Office or Region.

047 documentation - classification and associated markings required for classified or sensitive unclassified documents, the NRC report number unique to the report, title (and subtitle, if any), author or correspondent (if any), organization identification and contract number (or FIN number), date and availability.

048 draft or final material for inclusion in "Safety Evaluation Reports" or "Environmental Statements" (ES) - written material requested for input to SERs or ESs to be issued as NUREGs. Such material may be edited or modified at the discretion of the NRC staff.

049 formal technical reports - the final product of research, an original investigation, or a significant compilation of information. This product is a formal technical report for publication in the NUREG/CR series. For extensive long-term projects, formal monthly, quarterly or semiannual and annual periodic technical reports may be required. A draft of the final or periodic report may be requested for comment prior to preparation of the camera-ready copy.

0410 NRC project manager - the NRC staff member responsible for the work performed by consultants or contractors and their subcontractors, or for work performed under or pursuant to an interagency agreement.

0411 patent review - examination by legal staff to assure protection rights in inventions.

0412 proprietary information - trade secrets; privileged or confidential research, development, commercial or financial information, exempt from mandatory disclosure under 10 CFR Part 2 (Sections 2.740 and 2.790) and under 10 CFR Part 9 (Section 9.5); and other information submitted in confidence to the NRC by a foreign source and determined to be unclassified by the NRC.

0413 publicly available documents - information (reports and references) which is available in the NRC Public Document Room (PDR) for public inspection and copying or available in the public domain.

0414 reproducible masters - camera-ready copy which includes (1) originals of line drawings (or prints that can be copied), (2) glossy prints of black and white photographs (colored photographs cannot be reproduced), (3) original typed or printed text, tables, cover, title page, contents and abstract, or (4) other forms of the materials listed in (1), (2) and (3) that a printer can reproduce.

0415 technical reports - information on the technical aspects of contract work. These may be interim or final technical letter reports, draft or final formal technical reports for publication in the NUREG/CR or NUREG/CP series, or draft or final material for inclusion in SERs or ESs.

0416 technical letter reports (also called technical evaluation reports) - interim or final letters that provide information on the technical aspects of contract work. Interim technical letter reports may be required at various stages of a project. These reports usually are followed by a final technical letter report or a formal technical report. Final technical letter reports are usually specified in situations where the technical work is review and evaluation of work of others or work to be used by the staff in the licensing and regulation process. Interim letter reports may include, but are not limited to, informal (interim) progress reports, quick-look reports, data reports, status summary reports, project descriptions, pre-tested predictions, model verifications, experiment safety analyses, experiment operating procedures, facility certification reports, and test result reports.

0417 unique identification - NRC identification used on a report and its attachments, revisions, and supplements that is not used on any other report.

3202-05 BASIC REQUIREMENTS

051 Applicability. The provisions of this chapter and its appendix apply to NRC consultants, grantees, contractors and subcontractors, including those working under interagency agreements, whose contracts require the preparation of technical reports. Because of the unique requirements of NRC boards, panels, advisory committees and Offices which report directly to the Commission, the handling of reports prepared by consultants and contractors to them are governed by the Board or Panel Chairman and, in the case of advisory committees, by the Advisory Committee Management Officer, or the Commission. These exceptions do not preclude the use of the NUREG/CR series designation on reports prepared for these entities that are to be given wide public dissemination.

052 Forms. NRC Form 426A, "Publication Release for Unclassified NRC Contractor and Consultant Reports" (Exhibit 5), NRC Form 335, "Bibliographic Data Sheet" (Exhibit 7), and NRC Form 190, "Cover Sheet for Reports Containing Proprietary Information" (Exhibit 19), shall be used as provided in the appendix.

053 Appendix 202. This appendix contains standards and procedures for the preparation of reporting requirement portions of Statements of Work, and for the documentation, production, and dissemination of technical reports prepared by contractors and other government agencies in accordance with contract requirements or interagency agreements.

Approved: August 29, 1984

054 Preparation Requirements

- a. Reports to be Printed by NRC. All contractor reports to be printed by NRC shall be prepared according to Appendix 3202. The reproducible masters for the requisite distribution shall be transmitted to the Division of Technical Information and Document Control accompanied by completed NRC Form 426A and NRC Form 335.
- b. Reports Printed by Authorized Federal Printing Plants. All contractor reports to be printed by the contractor (as specified by the contract, agreement, or standard order for work) shall be prepared according to Appendix 3202 and a reproducible master and sufficient copies for standard and incidental distribution shall be supplied to the Division of Technical Information and Document Control, accompanied by completed NRC Form 426A, signed by the authorized contractor official. Each such report shall include, as the last page, a completed NRC Form 335.

055 References. The NRC chapters referenced and NUREG-0794 (ref. j) and NUREG-0650 (ref. i) are available from the Division of Technical Information and Document Control. The other publications are available from the Government Printing Office.

- a. Chapter NRC-0260, "Printing, Copying, Graphics and Photography."
- b. Chapter and Appendix NRC-2101, "NRC Security Program."
- c. Chapter NRC-3203, "Distribution of Unclassified NRC Staff- and Contractor-Generated Documents."
- d. Chapter NRC-1102, "Procedures for Placement of Work with the Department of Energy."
- e. Chapter NRC-3206, "NRC Contractor Speeches, Papers and Journal Articles on Regulatory and Technical Subjects."
- f. Chapter NRC-3207, "Conferences and Conference Proceedings."
- g. Title 44, U.S. Code, "Public Printing and Documents." Government Printing Office.
- h. Government Printing and Binding Regulations of the Joint Committee on Printing, Congress of the United States, No. 24, April 1977 (JCP Regulations), Government Printing Office.
- i. Title 5, U.S. Code, "Government Organization and Employees," Government Printing Office.

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- j. "Technical Writing Style Guide," A. W. Savolainen et al., compilers, U.S. NRC Report NUREG-0650, November 1979, and Supplement 1, February 1982.
- k. "Protection of Unclassified Safeguards Information," D. J. Kasun, USNRC Report NUREG-0794, October 1981.
- l. Chapter NRC-0255, "Mail Management," and Appendix 0255, Part V, Annex A.

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PART I

PREPARATION OF REPORTING REQUIREMENT PORTIONS OF
STATEMENTS OF WORK FOR CONTRACTS, GRANTS AND
STANDARD ORDERS FOR DOE WORK

A. LIST OF TECHNICAL REPORT REQUIREMENTS

List the technical reports required from each project, task or subtask, as applicable. State when and to whom they should be submitted and what they should contain. These reports may be unclassified, sensitive unclassified or classified. Standards for each of these categories are presented in Parts II through V. The following definitions describe the types of reports that may be specified:

technical reports - information on the technical aspects of contract work. These may be interim or final technical letter reports, draft or final formal technical reports for publication in the NUREG/CR or NUREG/CP series, or draft or final material for inclusion in SERs or ESs (see definitions below).

technical letter reports (also called technical evaluation reports) - interim or final letters that provide information on the technical aspects of the contract work. Interim technical letter reports may be required at various stages of a project. These interim letters usually are followed by a final technical letter report or a formal technical report. Final technical letter reports are usually specified in situations where the technical work is review and evaluation of work of others or work to be used by the staff in the licensing and regulation process. Interim letter reports may include, but are not limited to, informal (interim) progress reports, quick-look reports, data reports, status summary reports, project descriptions, pre-test predictions, model verifications, experiment safety analyses, experiment operating procedures, facility certification reports, and test result reports. These reports must be identified with the financial number (FIN) assigned to the project. They are not to be identified with DOE registered report codes. The number of copies to be prepared and the distribution of those copies will be specified by the project manager.

formal technical reports - the final product of research, an original investigation, or a significant compilation of information. This product is a formal technical report for publication in the NUREG/CR or NUREG/CP series. For extensive long-term projects, formal monthly, quarterly or semiannual and annual periodic technical reports may be required. A draft of the final or periodic report may be requested for comment prior to preparation of the camera-ready copy.

draft or final material for publication or inclusion in SERs, ESs, letters, or license amendments - written material requested for use in the NRC licensing process. Such material may be (1) abstracted in a NUREG report or attached to a NUREG report, (2) attached to a letter or an amendment to the license, or (3) abstracted and used as necessary by the NRC staff. NRC requires patent review and full management review of this material by the performing organization. This material is to be submitted to NRC as a technical letter report addressed to the project manager and identified by the FIN number.

For purposes of this Part, contractor means a private contractor, consultant, grantee, another State or Federal Agency working under an interagency agreement, or a DOE/facility or National Laboratory (contractor) and subcontractors.

B. REQUIREMENTS FOR FORMAL REPORTS

If the contractor is to prepare a final formal technical report for publication, state that it will be printed and distributed by NRC from camera-ready copy submitted by the contractor, unless the work is being done for the Office of Nuclear Regulatory Research by a DOE facility or Laboratory with a JCP-authorized printing plant. The camera-ready copy is to be prepared in accordance with the provisions of this appendix, Parts II and V (for contractors other than DOE contractors), or Parts IV and V of this appendix and Chapter 1102 (for DOE contractors). A style guide is also available free, upon request (NUREG-0650). If the report is to be printed by NRC and it is unclassified, the camera-ready copy is to be submitted by the contractor to the

NRC, Washington, D.C. 20555, by first class mail. For handling of sensitive unclassified and classified reports see Part V of this appendix and NRC Appendix 2101. Unclassified reports printed for the Office of Nuclear Regulatory Research should be handled in accordance with Parts IV and V of this appendix and/or Chapter 1102.

C. REQUIREMENTS FOR DRAFT REPORTS

If a draft is desired prior to completion of a final technical letter report, formal technical report, final material for inclusion in an SER or ES, or for comment by participants in cooperative programs with foreign governments and organizations and with U.S. industry, state that requirement and the time frame for delivering the final camera-ready copy after receiving NRC and/or participant comments on the draft. State that all draft material should be submitted to the cognizant project manager.

When the contractor is to submit draft material for comment prior to the preparation of the final report, state that if there are NRC program and/or participant comments the contractor will be asked to make changes. If agreement on the changes is reached, the NRC manager will authorize the contractor to prepare the final copy and submit it to the project manager, if it is a letter report or input to an SER or ES, or to the Director, Division of Technical Information and Document Control, if it is

camera-ready copy for printing and distribution. This is to be done to assure proper publication, handling, and distribution and, among other things, to preclude further changes that might nullify the agreement. If caveats were agreed to and the project manager wishes to check the final document for their presence, he/she should inform TIDC of that desire. In that case, upon receipt of the camera-ready copy by TIDC, the project manager will be informed and requested to prepare and sign the NRC Form 426A.

Also state that if agreement on changes to a formal technical report to be issued in the NUREG/CR series is not reached, the NRC project manager may request the contractor to prepare the camera-ready copy with, in addition to the standard disclaimer required on all contractor formal reports (see Exhibit 6), any caveats deemed necessary to cover NRC objections. Such caveats may range from the "The views expressed in this report are not necessarily those of the U.S. Nuclear Regulatory Commission" to the addition of a preface setting forth the NRC opinion or footnotes at appropriate locations within the text.

State that if NRC objections cannot be covered in this manner, NRC can refuse to publish the report. In the case of DOE/National Laboratory reports, the DOE Operations Office Manager responsible for that laboratory should be informed by the NRC Office Director or Regional Administrator of the decision and the reasons therefor, with a copy to the Laboratory Director. In the case of another Federal agency, a State, or a private contractor, the person who executed the contract should similarly be informed by the NRC Contracting Officer. The contractor is then free to publish without NRC identification of the report. Project manager or higher level decisions may be appealed to the NRC Executive Director for Operations.

D. PUBLISHING UNCLASSIFIED INFORMATION IN OPEN LITERATURE AND PRESENTING PAPERS

If the contractor's principal investigator is to be allowed to publish in the open literature instead of submitting a final report and/or present papers at public or association meetings during the course of the work, add the following statement to the Statement of Work:

The principal investigator(s) may publish the results of this work in the open literature instead of submitting a final report and/or present papers at public or association meetings at interim stages of the work.

If the project manager wants to review the paper or journal article prior to presentation or submission for publication, state this in the Statement of Work, as follows:

The principal investigator(s) may publish the results of this work in the open literature instead of submitting a final report and/or present papers at public or association meetings at interim stages of the work, if the article or paper has been reviewed by the NRC project

manager in draft form and agreement has been reached on the content. The applicable procedures set forth in Chapters NRC-3206 or NRC-1102 must be followed.

If agreement is not reached, NRC may also ask that the paper include in addition to the standard statement "Work supported by the U.S. Nuclear Regulatory Commission," any caveats deemed necessary to cover NRC objections. If NRC objections cannot be covered in this manner, NRC can refuse to authorize publication in the open literature and/or presentation of papers.

In the latter case, NRC will inform the contractor of the decision, as stated above for formal reports (see Section C, paragraphs 3 and 4). The contractor is then free to publish without NRC identification of the information. This will not affect payment of the contract work costs. Project manager or higher level decisions may be appealed to the NRC Executive Director for Operations.

If the contractor proposes to publish in the open literature or present the information at meetings in addition to submitting the required technical reports, approval of the proposed article or presentation should be obtained from the NRC project manager. The NRC project manager shall either approve the material as submitted, approve it subject to NRC-suggested revisions, or disapprove it. In any event, a project manager may disapprove or delay presentation or publication of papers on information that is subject to Commissioner approval that has not been ruled upon or which has been disapproved.

(See Chapter 3206 for provisions relating to payment of page charges and travel costs for presentation of papers.)

E. TYPOGRAPHY

The text of reports must be single spaced on 8½ x 11-in. paper, unless otherwise specifically authorized. Occasionally, reports with many symbols and mathematical expressions may require one and one-half spacing to provide for superscripts and subscripts. This spacing should be allowed where needed, but should be considered an exception, not the standard.

F. REPORTS CONTAINING SENSITIVE UNCLASSIFIED AND CLASSIFIED INFORMATION

Details of the marking of reports designated Official Use Only, Limited Official Use, Proprietary Information, Safeguards Information, and Classified (Confidential, Secret, and Top Secret) are provided in Part V of this appendix and in NRC Appendix 2101.

G. PUBLISHING UNCLASSIFIED PROCEEDINGS OF CONFERENCES AND WORKSHOPS

NRC publishes or assists in the publication of compilations of papers presented at meetings, conferences, and symposiums in which NRC

participates as a sponsor or cosponsor. Chapter NRC-3207, "Conferences and Conference Proceedings," provides general information and guidance for this. More detailed guidance is available from TIDC upon request.

H. WRITING AND PUBLISHING UNCLASSIFIED BOOKS

NRC may, under certain circumstances, publish books prepared by grantees or contractors. For general information and guidance on book publishing, see Chapter NRC-3210, "Book Writing and Publishing."

I. DISTRIBUTION OF REPORTS TO CONTRACTORS

Up to 50 copies of unclassified formal technical reports may be retained by or will be bulk shipped to the contractor by NRC for internal use. If fewer than 50 copies are needed, indicate the desired quantity on NRC Form 426A. Single copies for specific individuals in organizations other than the contractor's organization who are not included in the distribution requested by the NRC project manager may be requested on a project basis or on a report-by-report basis. The request, with written justification, should be addressed to the NRC project manager, with a copy to NRC/TIDC. If the additional distribution is approved by the NRC project manager, the contractor shall send these copies (if printing is done by the contractor) and address labels, even if printing is done by NRC, to NRC/TIDC, where the distribution will be made along with the standard distribution. Distribution of sensitive unclassified and classified reports will be made by the project manager on a case-by-case basis.

J. COORDINATION OF PRESS OR OTHER MEDIA RELEASES OF UNCLASSIFIED INFORMATION

A contractor may request permission to issue a press or other media release on the work being done. Such request shall be made to the project manager, who will consult with his/her management and with the Office of Public Affairs. The contractor may not issue a press release on nonroutine information without this prior coordination. This coordination may be accomplished by telephone, with the NRC project manager responsible for expeditious handling. Decisions not to release information or delays in handling by the project manager may be appealed to the NRC Executive Director for Operations.

PART II

UNCLASSIFIED FORMAL CONTRACTOR REPORTS
TO BE PRINTED BY NRC

A. DOCUMENTATION

1. Applicability

- a. The requirements of this part apply to contractor and inter-agency agreement reports that are to be printed by NRC. Contractors may not print reports prepared for NRC except those DOE laboratories with JCP-authorized printing plants and then only those reports prepared for NRC's Office of Nuclear Regulatory Research.
- b. With respect to sensitive unclassified and classified reports, the requirements set forth in Part V of this appendix shall be used in conjunction with NRC Appendix 2101.
- c. The requirements of this part do not apply to consultants and contractors of the NRC boards, panels, and advisory committees which report directly to the Commission.

2. Front Cover and Title Page

- a. Separate covers and title pages are required (see Exhibits 1 and 2 for contractor reports and Exhibits 3 and 4 for reports prepared under or pursuant to interagency agreements).*
- b. The items shown in Exhibits 1 through 4 and discussed below shall appear on the title page and cover, as appropriate.**

(1) NRC Report Number

Each report shall be identified by an NRC-controlled alpha-numeric designation as the prime designation unique to that report. The centralized report control system for unique identification is maintained by the Division of Technical Information and Document Control. Numbers may be obtained by calling the Division of Technical Information and Document Control or by submitting a copy of NRC Form 426A (Exhibit 5) with a request for a number.

* Reproducible copy of the cover of the performing organization may be submitted; however, the data elements shown in Exhibit 1 must be included.

** These requirements meet the specifications of American National Standard ANSI Z39.18-1974, Guidelines for Format and Production of Scientific and Technical Reports, and ANSI Z39.23-1974, Technical Report Numbers.

The NRC identification number will have the form:

NUREG/CR-XXXX or NUREG/CP-XXXX

where CP indicates conference proceeding. The contractor's report number, if any, may be inserted below the NUREG number on the title page and cover, as shown in Exhibits 1 through 4, if desired by the contractor.

When a report consists of more than one volume or binding or is issued in more than one edition, an appropriate volume, supplement, part or revision designation shall appear immediately below the report number.

(2) Title and Subtitle

- (a) Use a brief title that indicates clearly the subject matter covered in the report.
- (b) When a report is prepared in more than one volume, repeat the primary title on each volume.
- (c) If appropriate, show the type of report (e.g., annual report, final report, thesis, etc.) and the period covered as part of the subtitle.

(3) Personal Author(s)' Name(s)

Authors' names should be given on the title page and cover unless this is impractical, as in the case of annual reports which have many contributors. If authors' contributions are as editors, compilers, etc., so indicate on the title page following the names. In addition, list affiliation of each author only if affiliated with an organization other than the organization generating the document.

(4) Organization Identification

On the title page and cover, provide information of the type illustrated in Exhibits 1 through 4.

(5) Basis for Report Date(s)

- (a) The basis for dating may be shown along with the date on the title page. Various bases for dating are possible; e.g., date report completed, date reviews completed, date published, date distributed, etc.
- (b) More than one date, with the basis for each, may be shown where this is necessary.

3. Availability Information

All formal reports will be made available for sale by NRC and by the National Technical Information Service (NTIS). Exhibit 6 will be inserted on the inside of the front cover by the Division of Technical Information and Document Control.

4. Disclaimer

The following notice will be added during the printing step on the inside front cover (Exhibit 6): "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, or any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use, or the results of such use, of any information, apparatus, product or process disclosed in this report, or represents that its use by such third party would not infringe privately owned rights." The following additional statement, "The views expressed in this report are not necessarily those of the U.S. Nuclear Regulatory Commission" will be printed below the standard disclaimer, if appropriate. Other qualifying statements may be added, if needed (see Part I.C., Requirements for Draft Reports).

5. Previous Reports in Series

If the report being prepared is one in an ongoing series, list all previous reports in the series. Include report numbers and issuance dates. Place this list on the back of the title page.

6. Abstract

An abstract of 200 words or less shall be prepared for each formal report. Within the report, the abstract shall appear on a separate page between the list of previous documents in the series and the contents page.*

7. References and Bibliographies

Reports or other documents referenced in text, reference sections, bibliographies, and appendixes of unclassified regulatory and technical reports in the NUREG series must be available to the public either in the public domain (as in a public library, at the Government Printing Office, at the National Technical Information Service, or at other reference or sales outlets) or in the NRC Public Document Room. This means that references should not be made to personal communications and interviews, unpublished

*This preferred positioning of the abstract in the report need not be followed if the style manual of the originating organization requires a different location.

information and information with restricted distribution (e.g., proprietary, national security, official use only, etc.). If the unretrievable information is important and unrestricted, it can be quoted in the text, in footnotes, or in appendixes. If credit is due to individuals, they can be mentioned in the text or in an acknowledgement section. Availability may be stated collectively for all entries (see Exhibit 6).

Guidelines for developing and presenting reference material are provided in NUREG-0650, "Technical Writing Style Guide," published in November 1979 (see Appendix A, pp. 19-23, for specific guidance) and Supplement 1 dated February 1982.

8. Bibliographic Data Sheet

NRC Form 335 (Exhibit 7) shall be prepared and included in the camera-ready copy as the final right-hand page.

B. PATENT AND SECURITY REVIEWS

1. Patent Review

Patent implications shall be considered prior to approval of reports for public release so that disclosure will not adversely affect the patent rights of NRC or the contractor. If the work being reported is contractually managed through another government agency (e.g., DOE laboratories), that government agency should be requested by the contractor to perform the patent review. The result of such review shall be reported on NRC Form 426A in item 11 (Exhibit 5).

If NRC directly administers the contract or the contractor is unable to obtain a patent clearance from the government agency administering the contract, the responsible NRC contracting officer shall be consulted, and the responsible NRC project manager shall consider the patent implications. If there is no need for patent review because of the certainty that the report contains no description of novel technical developments which may be of an inventive nature, NRC Form 426A may be completed with the statement "Not Applicable" or "N/A" in the space for the Patent Counsel's signature. If there is a possibility that there is disclosure of developments of an inventive nature, the contracting officer shall request assistance from the NRC Patent Counsel, Office of the Executive Legal Director.

2. Security Review

In most cases, contractor reports will be unclassified. Should a report of sensitive unclassified or classified work be required, however, the NRC project manager must work with the NRC Division of Security to establish the appropriate procedures and inform the contractor of such procedures through the contracting officer. The standards for marking and handling such reports are given in Part V of this appendix and NRC Appendix 2101.

C. PROCEDURES FOR PRINTING AND DISTRIBUTING

1. Printing

Reproducible masters prepared in accordance with this appendix shall be transmitted to the Division of Technical Information and Document Control, accompanied by completed NRC Form 426A (Exhibit 5). NRC Form 426A must be signed by the NRC project manager or a contractor official authorized by the project manager. Such authorization shall be reported in writing to TIDC.

The Division of Technical Information and Document Control will review the masters for adherence to the standards set forth in this chapter and appendix and will arrange for printing and distributing the report. Unsatisfactory masters will be reported to the NRC project manager for appropriate contractual action by the contracting officer or, in the case of government agency or interagency agreement work, the publications manager of the performing organization.

2. Reprinting

Requests for reprinting any report subsequent to the initial printing require approval of the Division of Technical Information and Document Control. Each request shall include a written justification and the project manager's approval for reprinting along with address labels for the recipients.

3. Distribution of Reports

All copies of unclassified formal contractor reports will be distributed by the Division of Technical Information and Document Control in accordance with instructions on NRC Form 426A (Exhibit 5). The Division of Technical Information and Document Control will also arrange automatic distribution of these reports to the NRC Document Control System, the NRC Public Document Room, the National Technical Information Service (NTIS), the Government Printing Office and the Depository Library Service.

If any distribution is to be made other than, or in addition to, the standard distribution established for the report, written justification and the project manager's approval for printing additional copies shall accompany the reproducible masters when submitted to the Division of Technical Information and Document Control. Address labels for the additional distribution must be supplied.

Distribution of sensitive unclassified and classified reports will be made by the NRC project manager on a case-by-case basis.

EXHIBIT 1

SAMPLE COVER FOR UNCLASSIFIED FORMAL CONTRACTOR-PREPARED
DOCUMENTS, EXCLUDING THOSE PREPARED UNDER OR PURSUANT TO
INTERAGENCY AGREEMENTS

NRC Report No.
Contractor Report No. (if any)
Vol., Part, Rev., etc. (if any)

NUREG/CR-1676
NUSAC-556
Vol. 1

Title

Using Advanced Process Monitoring
to Improve Material Control

Subtitle and Type of Report
(Annual, Topical, etc.)

Final Report
September 1979 - September 1980

Author(s)

Prepared by R. L. Hawkins, R. L. Lynch, R. F. Lumb

Contractor

MUSAC Incorporated

NRC

Prepared for
U.S. Nuclear Regulatory
Commission

EXHIBIT 2

SAMPLE TITLE PAGE FOR UNCLASSIFIED FORMAL CONTRACTOR-
PREPARED DOCUMENTS, EXCLUDING THOSE PREPARED UNDER OR
PURSUANT TO INTERAGENCY AGREEMENTS

NRC REPORT No.
Contractor Report No. (if any)
Vol., Part, Rev., etc. (if any)
Distribution Category No. (if any)

NUREG/CR-1676
NUSA C-556
Vol. 1

Title

Using Advanced Process Monitoring
to Improve Material Control

Subtitle and Type of Report
(Annual, Topical, etc.)

Final Report
September 1979 - September 1980

Report Dates and Bases

Manuscript Completed: September 1980
Date Published: September 1980

Author(s), Editor(s),
Compiler(s), etc.

Prepared by
R. L. Maxwell, H. L. Lynch, R. F. Lump

Contractor Name
and Address

NUSAC, Incorporated
7925 Jones Branch Drive
McLean, VA 22102

NRC Sponsorship

Prepared for
Division of Safeguards
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D. C. 20545
NRC FIN B6437

NRC Contract No.

EXHIBIT 3

SAMPLE COVER FOR UNCLASSIFIED FORMAL REPORTS PREPARED
UNDER OR PURSUANT TO INTERAGENCY AGREEMENTS

NRC Report No.
Contractor Report No.
Vol., Part, Rev., etc.

NUREG/CR-1952
SAND81-0151

Title

LOCA-Simulation Thermal-Shock Test of Sliding-Link Terminal Blocks

Type of Report
or Subtitle

Independent Verification Testing Program
Independent Verification Test-1

Author(s), Editor(s)

Prepared by: L. L. Bonzon, W. H. Bickelw, F. V. Thome, J. A. Lewin, T. W. G. more SNL
V. R. Rutherford, A. E. Bennett NRC

Contractor

Sandia National Laboratories

Sponsorship

Prepared for
U. S. Nuclear Regulatory
Commission

EXHIBIT 4

SAMPLE TITLE PAGE FOR UNCLASSIFIED FORMAL REPORTS PREPARED
UNDER OR PURSUANT TO INTERAGENCY AGREEMENTS

NRC Report No.
Contractor's Report No.
Vol., Part, Rev., etc.
Distribution
Category

NUREG/CR-1952
SAND81-0151
R4

Title

LOCA-Simulation Thermal-Shock
Test of Sliding-Link Terminal
Blocks

Subtitle

Independent Verification Testing Program
Independent Verification Test-1

Report Dates

Manuscript Completed: January 1981
Date Published: May 1981

Author(s), Editor(s)

Prepared by
L. L. Bonzon W. H. Buckalew P. V. Thome J. A. Lewis T. W. Genore S.N.L.
W. B. Rutherford A. B. Bennett NRC

Contractor's
Name and Address

Sandia National Laboratories
Albuquerque, NM 87185

NRC Sponsorship

Prepared for
Division of Resident and Regional Reactor Inspection
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN 83101

NRC FIN No.

PUBLICATION OF TECHNICAL REPORTS PREPARED BY
 NRC CONTRACTORS, INCLUDING REPORTS PREPARED
 UNDER OR PURSUANT TO INTERAGENCY AGREEMENTS

NRC Appendix 3202
 Part II

EXHIBIT 5
 NRC FORM 426A, PUBLICATIONS RELEASE FOR UNCLASSIFIED
 NRC CONTRACTOR AND CONSULTANT REPORTS

NRC FORM 426A (3-78) NRC 426A		U.S. NUCLEAR REGULATORY COMMISSION		1. REPORT NUMBER (if any)	2. REPORT NUMBER (if any) (Number of Technical Information and Distribution Category)
PUBLICATIONS RELEASE FOR UNCLASSIFIED NRC CONTRACTOR AND CONSULTANT REPORTS (FROM TYPE OF PRINT)				3. DISTRIBUTION CATEGORY NO. (if any)	4. DISTRIBUTION CATEGORY NO. (if any)
5. TITLE AND SUBTITLE (Check in full or abbrev. on separate sheet)					
6. AUTHOR(S) (Check in full or abbrev. on separate sheet)					
7. NAME OF CONTRACTOR		8. MAILING ADDRESS (Number and Street, City, State and Zip Code)		9. TELEPHONE NO.	
10. DATE MANUSCRIPT COMPLETED	11. NRC PROGRAM SPONSOR TECHNICAL MONITOR			12. TELEPHONE NO.	
13. CONTRACT DATA					
a. CONTRACT OR FILE NUMBER (Do not use DOE contract number)					
b. IF CONTRACTOR IS AUTHORIZED TO PRINT PLEASE PROVIDE THE FOLLOWING INFORMATION					
Number of Copies Printed		Estimated Contract Cost		Estimated Printing Cost	
14. TYPE OF DOCUMENT (Check appropriate box)					
a. TECHNICAL REPORT					
(1) FORMAL					
(2) INTERIM					
b. CONFERENCE PAPER					
(1) TITLE OF CONFERENCE PAPER					
(2) DATE(S) OF CONFERENCE					
(3) LOCATION OF CONFERENCE					
c. OTHER (Indicate type of doc. e.g. thesis, report, letter, etc.)					
15. SPECIAL DISTRIBUTION (Send to copies to the Director, Services Branch, Division of Technical Information and Document Control, 400 9th St., Washington, DC 20545. Also send to all appropriate offices or send to appropriate addresses. For the appropriate use of this form, see the instructions. Contact instructions on reverse of separate sheet if necessary.)					
16. PATENT CLEARANCE (If applicable)			17. SUBMITTED BY		
- Forward completed report NRC Form 426A together with the required information for review to: Address and Patent Counsel			a. NAME OF AUTHORIZED CONTRACTOR OFFICIAL OR NRC MONITOR (Last, first, middle)		
18. PATENT CLEARANCE NOT REQUIRED			b. OFFICIAL'S ORGANIZATIONAL UNIT		
19. PATENT CLEARANCE GRANTED					
20. PATENT CLEARANCE DENIED					
21. PATENT COUNSEL'S SIGNATURE		22. DATE		23. SIGNATURE AUTHORIZED APPROVAL OFFICER (Last, first, middle)	
				24. DATE	

EXHIBIT 6
DISCLAIMER AND AVAILABILITY STATEMENTS
(BACK OF COVER)

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, or any of their employees, makes any warranty, expressed or implied, or assumes any legal liability of responsibility for any third party's use, or the results of such use, of any information, apparatus, product or process disclosed in this report, or represents that its use by such third party would not infringe privately owned rights.

NOTICE

Availability of Reference Materials Cited in NRC Publications

Most documents cited in NRC publications will be available from one of the following sources:

1. The NRC Public Document Room, 1717 H Street, N.W.,
Washington, DC 20566
2. The NRC/GPO Sales Program, U.S. Nuclear Regulatory Commission,
Washington, DC 20566
3. The National Technical Information Service, Springfield, VA 22161

Although the listing that follows represents the majority of documents cited in NRC publications, it is not intended to be exhaustive.

Referenced documents available for inspection and copying for a fee from the NRC Public Document Room include NRC correspondence and internal NRC memoranda; NRC Office of Inspection and Enforcement bulletins, circulars, information notices, inspection and investigation notices; License Event Reports; vendor reports and correspondence; Commission papers; and applicant and licensee documents and correspondence.

The following documents in the NUREG series are available for purchase from the NRC/GPO Sales Program: formal NRC staff and contractor reports, NRC-sponsored conference proceedings, and NRC booklets and brochures. Also available are Regulatory Guides, NRC regulations in the Code of Federal Regulations, and Nuclear Regulatory Commission issuances.

Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactions. Federal Register notices, federal and state legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free, to the extent of supply, upon written request to the Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, DC 20566.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, 7920 Norfolk Avenue, Bethesda, Maryland, and are available there for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from the American National Standards Institute, 1430 Broadway, New York, NY 10018.

GPO Printed copy price: _____

EXHIBIT 7
 NRC FORM 335 - BIBLIOGRAPHIC DATA SHEET

NRC FORM 335 (2-81) MARCH 1982 5010.335 SEE INSTRUCTIONS ON THE REVERSE U.S. NUCLEAR REGULATORY COMMISSION BIBLIOGRAPHIC DATA SHEET		1. REPORT NUMBER (assigned by TRAC and the No. of copy)
3. TITLE AND SUBTITLE	2. LEAVE BLANK	
	4. DATE REPORT COMPLETED MONTH: _____ YEAR: _____	
5. AUTHOR(S)	6. DATE REPORT ISSUED MONTH: _____ YEAR: _____	
	7. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS (include Zip Code)	
8. SPONSORING ORGANIZATION NAME AND MAILING ADDRESS (include Zip Code)	9. PROJECT / TASK / WORK UNIT NUMBER	
	10. FTR OR BRLT NUMBER	
11. SUPPLEMENTARY NOTES	12. TYPE OF REPORT	
	13. PERIOD COVERED (inclusive dates)	
14. ABSTRACT (SEE FORM 336)		
15. SUBJECT ANALYSIS -- SEE WORDS-DESCRIPTORS		16. AVAILABILITY STATEMENT
17. IDENTIFY RELATED ENDS TERMS		18. SECURITY CLASSIFICATION (If you report) _____ (If you report) _____
		19. NUMBER OF PAGES
		20. PRICE

EXHIBIT 7 (Continued)
BACK OF NRC FORM 335

DO NOT PRINT THESE INSTRUCTIONS AS A PAGE IN THE NUREG REPORT

INSTRUCTIONS

NRC FORM 335, BIBLIOGRAPHIC DATA SHEET, IS BASED ON GUIDELINES FOR FORMAT AND PRODUCTION OF SCIENTIFIC AND TECHNICAL REPORTS, ANSI Z39.18-1974 AVAILABLE FROM AMERICAN NATIONAL STANDARDS INSTITUTE, 1430 BROADWAY, NEW YORK, NY 10018. EACH SEPARATELY BOUND REPORT—FOR EXAMPLE, EACH VOLUME IN A MULTIVOLUME SET—SHALL HAVE ITS UNIQUE BIBLIOGRAPHIC DATA SHEET.

1. **REPORT NUMBER.** Each individually bound report shall carry a unique alphanumeric designation (NUREG) assigned by the Division of Technical Information and Document Control, ADM, in accordance with American National Standard ANSI Z39.23-1974, Technical Report Number (STRN). Use uppercase letters, Arabic numerals, slashes, and hyphens only, as in the following examples: NUREG-0100, NUREG/CP-0010, NUREG/CR-0100, and NUREG/BR-0010. For reports in a series add Vol., Sub., Revision, and Addendum, when necessary. Add contractor cross-reference identification number (if any) before NUREG number, e.g., PNL-XXXX, SANDXX-XXXX, SA1-XXXX.
2. **TITLE AND SUBTITLE.** Title should indicate clearly and briefly the subject (coverage) of the report, including any subtitle to the main title. When a report is prepared in more than one volume, repeat the primary title, add volume number and include subtitle for the specific volume. Use upper and lower case letters, but capitalize computer code names. Do not use acronyms and initials in titles; they be added in parenthesis.
3. **LEAVE BLANK.**
4. **DATE REPORT COMPLETED.** Each report shall carry a date indicating month and year project/task completed.
5. **AUTHOR(S).** Give name(s) in conventional order (e.g., John R. Doe, J. Robert Doe). List author's affiliation if it is different from the performing organization.
6. **DATE REPORT ISSUED.** Each report shall carry a date indicating month and year published.
7. **PERFORMING ORGANIZATION NAME AND MAILING ADDRESS.** Give name, street, city, state, and ZIP code. List no more than two levels of an organizational hierarchy. Display the name of the organization exactly as follows: Division, Office, Organization or Government agency, & address.
8. **PROJECT/TASK/WORK UNIT NUMBER.** Use the project, task and work unit numbers under which the report was prepared (if any).
9. **FIN OR GRANT NUMBER.** Insert the FIN or grant number under which report was prepared.
10. **SPONSORING ORGANIZATION.** List NRC Division, Office, U.S. Nuclear Regulatory Commission, Washington, DC 20555.
11. **a. TYPE OF REPORT.** State draft, final, preliminary, topical, technical, regulatory, quarterly, etc., and, if applicable, include date.
b. PERIOD COVERED.
12. **SUPPLEMENTARY NOTES.** Enter information not included elsewhere but useful, such as: Prepared in cooperation with . . . Presented at conference of . . . To be published . . . Docket No. . . . When a report is revised, indicate whether the new report supersedes or supplements the older report.
13. **ABSTRACT.** Include a brief (200 words or less) factual summary of the most significant information contained in the report. If the report contains a significant bibliography or literature survey or multiple volumes, mention it here. Abstract is to be prepared by author or project manager.
14. **DOCUMENT ANALYSIS**
 - a. **KEY WORDS/DESCRIPTORS.** Select from the Energy Data Base Subject Thesaurus, DOE/TIC-700R R-5, the proper authorized terms that identify the major concept of the research and are sufficiently specific and precise to be used as index entries for cataloging.
 - b. **IDENTIFIERS AND OPEN-ENDED TERMS.** Use identifiers for project names, code names, equipment designators, etc. Use open-ended (keywords) terms written in descriptor form (14a) for those subjects for which no descriptor exists in the thesaurus.
15. **AVAILABILITY STATEMENT.** Denote public availability, for example "unlimited", or limitation for reasons other than security.
16. **SECURITY CLASSIFICATION.** Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., unclassified).
17. **NUMBER OF PAGES.** Leave blank. (Added by NTIS)
18. **PRICE.** Leave blank. (Added by NTIS)

PART III

UNCLASSIFIED TECHNICAL LETTER REPORTS

A. FORMAT

1. Applicability

- a. The requirements of this part apply to unclassified contractor technical letter reports. (See Part I.A for definition.)
- b. The requirements of this part do not apply to consultants and contractors to the NRC boards, panels, and advisory committees which report directly to the Commission.

2. Requirements

Technical letter reports are prepared, duplicated and distributed in accordance with the requirements of the Statement of Work in the contract or in the Standard Order for DOE Work. Each such report must be identified with the financial number (FIN) assigned to the project. The number of copies to be prepared and the distribution of those copies will be specified by the project manager. If unclassified and non-sensitive, the NRC project manager is responsible for making such reports available in the NRC Public Document Room (PDR) by sending them to the PDR through the NRC Document Control System.

B. PATENT AND SECURITY REVIEWS

1. Patent Review

Patent implications shall be considered prior to approval of reports for public release so that disclosure will not adversely affect the patent rights of NRC. If the work being reported is contractually managed through another government agency (e.g., DOE laboratories), that government agency should be requested by the contractor to perform the patent review.

If NRC directly administers the contract or the contractor is unable to obtain a patent clearance from the government agency administering the contract, the responsible NRC contracting officer shall be consulted, and the responsible NRC project manager shall consider the patent implications.

If there is a possibility that there is disclosure of developments of an inventive nature, the NRC contracting officer shall request assistance from the NRC Patent Counsel, Office of the Executive Legal Director.

2. Security Review

In most cases, contractor technical letter reports will be unclassified. Should a report of sensitive unclassified or classified work be required, however, the project manager must work with the Division of Security to establish the appropriate security procedures and inform the contractor of such procedures. The standards for marking and handling such reports are given in Part V of this appendix and NRC Appendix 2101.

PART IV

UNCLASSIFIED FORMAL REPORTS TO BE PRINTED FOR THE NRC
OFFICE OF NUCLEAR REGULATORY RESEARCH BY DOE
LABORATORIES WITH JCP-AUTHORIZED FEDERAL PRINTING PLANTS

A. DOCUMENTATION

1. Applicability

- a. The requirements of this part apply to NRC staff who are responsible for agreements with DOE Laboratories and their contractors who print regulatory and technical reports required by NRC. (See also Chapter NRC-1102).
- b. With respect to sensitive unclassified and classified reports the requirements set forth in Part V of this appendix shall be used in conjunction with NRC Appendix 2101.
- c. The requirements of this part do not apply to consultants and contractors to the NRC boards, panels and advisory committees which report directly to the Commission.

2. Front Cover and Title Page

- a. Separate covers (of different paper than that of the text) and title page are required.*
- b. Items such as those shown in Exhibits 3 and 4 and discussed below shall appear on the front cover and title page, as appropriate.** While layouts and typefaces need not be exactly the same as in Exhibits 3 and 4, the items shall appear in approximately the locations indicated and with the same relative prominence.

(1) NRC Report Number

Each report shall be identified by an NRC-controlled alpha-numeric designation as the prime designation unique to that document. The centralized report control system for unique identification is maintained by the Division of Technical Information and Document Control. Numbers may

*The cover stock of the performing organization may be used; however it must include the data elements shown in Exhibit 3.

**These requirements meet the specifications of American National Standard ANSI Z39.18-1974, "Guidelines for Format and Production of Scientific and Technical Reports," and ANSI Z39.23-1974, "Technical Report Numbers."

be obtained by calling the Division of Technical Information and Document Control or by submitting a copy of NRC Form 426A (Exhibit 5) with a request for a number.

The NRC identification number will have the form:

NUREG/CR-XXXX or NUREG/CP-XXXX

The contractor's report number, if any, will be inserted below the NUREG number on the title page and cover, as shown in Exhibits 3 and 4, if desired by the contractor.

When a report consists of more than one volume or binding or is issued in more than one edition, an appropriate volume, supplement, part, or revision designation shall appear immediately below the report number(s). NRC report numbers on covers and title pages shall be shown entirely on one line to facilitate computer processing.

(2) Title and Subtitle

- (a) Use a brief title, which indicates clearly the subject matter covered in the report.
- (b) When a report is prepared in more than one volume, repeat the primary title on each volume.
- (c) If appropriate, show the type of report (e.g., annual report, final report, etc.) and the period covered as part of the subtitle.

(3) Personal Author(s)' Name(s)

- (a) Authors' names should be given on the title page and cover unless this is impractical, as in the case of annual reports which have many contributors. If authors' contributions are as editors, compilers, etc., so indicate on title page and cover following the names. In addition, list affiliation of each author only if affiliated with an organization other than the organization generating the report.
- (b) Authors may be identified on backstrips (spines) of bound volumes.

(4) Organization Identification

- (a) On the cover, provide the name of the contractor responsible for preparing the report, followed by "Prepared for the U.S. Nuclear Regulatory Commission."

(b) On the title page, provide information of the type illustrated in Exhibit 4.

(5) Basis for Report Dates(s)

(a) The basis for dating may be shown along with the date on the title page. Various bases for dating are possible; e.g., date report completed, date reviews completed, date published, date distributed, etc.

(b) More than one date, with the basis for each, may be shown where this is necessary.

3. Availability and Price Information

All formal reports will be made available for sale by NRC and NTIS. The statement shown in Exhibit 6 is required on the inside of the front cover.

4. Disclaimer

The following notice shall be added during the printing step on the inside front cover (Exhibit 6): "This report was prepared as an account of work sponsored by the United States Government. Neither the United States Government nor any agency thereof, or any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for any third party's use, or the results of such use, of any information, apparatus, product or process disclosed, or represents that its use by such third party would not infringe privately owned rights." The following additional statement, "The views expressed in this report are not necessarily those of the U.S. Nuclear Regulatory Commission" will be printed below the standard disclaimer, if appropriate. Other qualifying statements may be added, if needed (see Part I.C., Requirements for Draft Reports).

5. Previous Reports in Series

If the report being prepared is one in an ongoing series, list all previous reports in the series. Include report numbers and issuance dates. Place this list on the back of the title page.

6. Abstract

An abstract of 200 words or less shall be prepared for each formal report. Within the report, the abstract shall appear on a separate page between the list of previous documents in the series and the contents page.*

* This preferred positioning of the abstract in the document need not be followed if the style manual of the originating organization requires a different location.

7. References and Bibliographies

Reports or other documents referenced in text, reference sections, bibliographies, and appendixes of unclassified regulatory and technical reports in the NUREG series must be available to the public either in the public domain (as in a public library, at the Government Printing Office, at the National Technical Information Service, or at other reference or sales outlets) or in the NRC Public Document Room. This means that references should not be made to personal communications and interviews, unpublished information and information with restricted distribution (e.g., proprietary, national security, official use only, etc.). If the unretrievable information is important and unrestricted, it can be quoted in the text, in footnotes, or in appendixes. If credit is due to individuals, they can be mentioned in the text or in an acknowledgement section. Availability may be stated collectively for all entries (see Exhibit 6).

Guidelines for developing and presenting reference material are provided in NUREG-0650, "Technical Writing Style Guide," published in November 1979 (see Appendix A, pp. 19-23, for specific guidance) and Supplement 1 dated February 1982.

8. Bibliographic Data Sheet

NRC Form 335 (Exhibit 7) shall be prepared and included in the camera-ready copy as the final right-hand page.

B. PATENT AND SECURITY REVIEWS

1. Patent Review

Patent implications shall be considered prior to approval of reports for public release so that disclosure will not adversely affect the patent rights of NRC or the contractor. The DOE Operations Office responsible for the contractor should perform the patent review. The results of such review shall be reported by the contractor on NRC Form 426A in item 11 (Exhibit 5).

2. Security Review

In most cases, reports will be unclassified. Should a report of sensitive unclassified or classified work be required, however, the NRC project manager must work with the Division of Security to establish the appropriate classification procedures and inform the contractor. The standards for marking and handling such reports are given in Part V of this appendix and NRC Appendix 2101.

C. PROCEDURES FOR PRINTING AND DISTRIBUTING

1. Printing

Contractor reports may be printed only by a JCP-authorized printing plant and then only if prepared for the NRC Office of Nuclear Regulatory Research. Reports printed by the contractor and one reproducible master shall be submitted to the Division of Technical Information and Document Control, with completed NRC Form 426A. The number of copies specified by the Statement of Work for standard and incidental distribution shall be provided. The appropriate identifying number (NUREG/CR-__) may be obtained as discussed in Section A.2.b.(1).

2. Reprinting

Requests for reprinting of any report at NRC expense subsequent to the initial printing requires approval of the Division of Technical Information and Document Control. The request shall include a written justification and the project managers approval for the reprinting, along with address labels for the recipients.

3. Distribution of Reports

All copies of unclassified formal contractor reports will be distributed by the Division of Technical Information and Document Control in accordance with instructions on NRC Form 426A (Exhibit 5). NRC Form 426A must be signed by a contractor official authorized by the project manager. Such authorization shall be reported in writing to the Division of Technical Information and Document Control.

If any distribution is to be made other than, or in addition to, the standard distribution established for the report, written justification and the project manager's approval for printing additional copies shall accompany the reproducible masters when submitted to the Division of Technical Information and Document Control. Address labels for the additional distribution must be supplied.

The Division of Technical Information and Document Control will arrange automatic distribution of these reports to the NRC Document Control System, the NRC Public Document Room, the National Technical Information Service (NTIS), the Government Printing Office and the Depository Library Service.

Distribution of sensitive (unclassified) and classified reports will be made by the NRC project manager on a case-by-case basis.

PART V

REPORTS CONTAINING SENSITIVE UNCLASSIFIED
AND CLASSIFIED INFORMATION

A. APPLICABILITY

These procedures and exhibits of this part apply to sensitive unclassified and classified reports prepared by NRC contractors. These reports include those designated:

Official Use Only
Limited Official Use
Proprietary Information
Safeguards Information
Confidential
Secret
Top Secret

Only sufficient information is presented here to aid in the preparation of the properly marked covers, title pages, back covers, and text pages. Details of the NRC Security Program and specific provisions for determining when to use the markings exhibited are contained in NRC Appendix 2101.

The reports covered are defined as sensitive unclassified or classified. Sensitive unclassified information refers to information designated Official Use Only, Limited Official Use, and Proprietary Information. Sensitive unclassified information also includes Safeguards Information that must be protected from unauthorized disclosure pursuant to 10 CFR 73.21 and Section 147 of the Atomic Energy Act of 1954, as amended, information withheld from public dissemination under the Freedom of Information Act or Privacy Act, and information not to be exported to or disclosed to foreign countries.

Classified information as used in this part includes Restricted Data, Formerly Restricted Data or National Security Information that requires protection in one of the three classification categories described in Executive Order 12356: Top Secret, Secret or Confidential.

The uses of each of the sensitive unclassified and classified categories and the markings required on reports are discussed and exhibited in the following sections. All sensitive unclassified and classified reports are to be sent directly to the project manager.

B. OFFICIAL USE ONLY AND LIMITED OFFICIAL USE INFORMATION.

NRC regulations require an Official Use Only marking to be placed on a report only when the originator or other holder believes the marking is

essential to ensure proper handling. Reports designated Official Use Only will contain only unclassified information originated by or furnished to an NRC contractor which is to be withheld from public disclosure. The report on which the marking appears must be reviewed at the time a request for release is received to determine its releasability. The Official Use Only marking is notice of the originator's determination of the applicability of an exemption under the Freedom of Information Act or Privacy Act or both at the time of origination.

Official Use Only NRC contractor reports shall be marked as shown in Exhibits 8 through 10.

Limited Official Use information is information originated by the U.S. Department of State. A report originated by an NRC contractor that contains Limited Official Use information shall be marked as shown in Exhibits 11 through 13.

Procedures for reproducing, transmitting, protecting, and handling reports containing Official Use Only and Limited Official Use information and removing such reports from those categories are detailed in NRC Appendix 2101.

C. PROPRIETARY INFORMATION

Proprietary information is a specific type of Official Use Only information. Proprietary information includes:

1. trade secrets.
2. privileged or confidential research, development, commercial or financial information exempt from mandatory disclosure under 10 CFR Part 2, "Rules of Practice for Domestic Licensing Proceedings," Sections 2.740 and 2.790 and under 10 CFR Part 9, "Public Records," Section 9.5, "Exemptions."
3. information submitted in confidence to NRC by a foreign source, which has been determined by NRC to be unclassified.

Unclassified NRC contractor reports containing proprietary information shall be marked as shown in Exhibits 14 through 18. In each instance, the optional wording that describes the material being presented should be selected.

If a report contains both Official Use Only information and proprietary information, the front cover shall be marked as proprietary information and may also be marked as Official Use Only information, if necessary. Pages in the report that contain proprietary information may be marked accordingly, including, marginal or other indicators of the specific wording that is proprietary. Similarly, the pages that contain Official Use Only information without proprietary information may be marked Official Use Only

Procedures for reproducing, transmitting, protecting and handling proprietary information reports and removing them from the proprietary information category are detailed in NRC Appendix 2101. A cover sheet (Exhibit 19) is to be placed on each hard copy of a report containing proprietary information.

D. SAFEGUARDS INFORMATION

Safeguards information may be of three types: (1) classified information, which is marked and handled as indicated in Section E, (2) unclassified information restricted under Section 147 of the Atomic Energy Act, which is marked and handled as described in this Section, and (3) unclassified information, which is publicly available and handled as indicated in Parts I through IV.

The safeguards information that is to be protected as described here is unclassified information used in a report which specifically identifies certain licensee's or applicant's detailed:

1. security measures for the physical protection of special nuclear material
2. security measures for the physical protection and location of certain plant equipment vital to the safety of production or utilization facilities.

Unclassified NRC contractor reports containing safeguards information that is to be protected shall be marked as shown in Exhibits 20 through 22.

Procedures for reproducing, transmitting, protecting, and handling safeguards information reports and removing them from the safeguards information category are detailed in NRC Appendix 2101. A cover sheet (Exhibit 23) is to be placed on each hard copy of a report containing safeguards information.

E. CLASSIFIED INFORMATION

Classified information is limited to Restricted Data, Formerly Restricted Data and National Security Information. The procedures for making classification determinations and for marking, reproducing, transmitting, protecting, and handling reports containing classified information and removing such reports from classified categories are detailed in NRC Appendix 2101. These procedures are too complex for summarizing here.

Classification determinations regarding NRC information may be made solely by authorized classifiers designated by NRC or DOE. Authorized classifiers are responsible for insuring that reports they determine to be classified are marked and protected in accordance with the provisions of NRC Appendix 2101.

It is important to note that information may not be classified in order to prevent or delay the release of information that does not require protection in the interest of national security. Basic scientific research information not clearly related to national security may not be classified.

EXHIBIT 8
SAMPLE COVER FOR A CONTRACTOR REPORT CONTAINING
OFFICIAL USE ONLY INFORMATION

OFFICIAL USE ONLY

NUREG/CR-XXXX (S)

Title
Subtitle and Type of Report

Author(s), Editor(s)
Contractor
Prepared for
U.S. Nuclear Regulatory Commission

WITHHOLD FROM PUBLIC DISCLOSURE

OFFICIAL USE ONLY

EXHIBIT 9
SAMPLE TITLE PAGE FOR A CONTRACTOR REPORT CONTAINING
OFFICIAL USE ONLY INFORMATION

OFFICIAL USE ONLY

NUREG/CR-XXXX (S)

Title
Subtitle and Type of Report

Manuscript Completed: (date)
Date Published: (month, year)
Author(s), Editor(s)
Contractor name and address

Prepared for
Division
Office
U. S. Nuclear Regulatory Commission
Washington, D. C. 20548
NRC File No.

OFFICIAL USE ONLY

**EXHIBIT 10
SAMPLE BACK COVER FOR A CONTRACTOR REPORT CONTAINING
OFFICIAL USE ONLY INFORMATION**

OFFICIAL USE ONLY

OFFICIAL USE ONLY

EXHIBIT 11
SAMPLE COVER FOR A CONTRACTOR REPORT CONTAINING
LIMITED OFFICIAL USE INFORMATION

LIMITED OFFICIAL USE

NUREG/CR-XXXX (S)

Title
Subtitle and Type of Report

Author(s), Editor(s)
Contractor
Prepared for
U.S. Nuclear Regulatory Commission

WITHHOLD FROM PUBLIC DISCLOSURE

LIMITED OFFICIAL USE

EXHIBIT 12
SAMPLE TITLE PAGE FOR A CONTRACTOR REPORT CONTAINING
LIMITED OFFICIAL USE INFORMATION

LIMITED OFFICIAL USE

NUREG/CR-XXXX (S)

Title
Subtitle and Type of Report

Manuscript Completed: (month)
Date Published: (month, year)
Author(s), Editor(s)
Contractor name and address

Prepared for
Division
Office
U.S. Nuclear Regulatory Commission
Washington, D.C. 20548
NRC PIN No.

LIMITED OFFICIAL USE

EXHIBIT 13
SAMPLE BACK COVER FOR A CONTRACTOR REPORT CONTAINING
LIMITED OFFICIAL USE INFORMATION

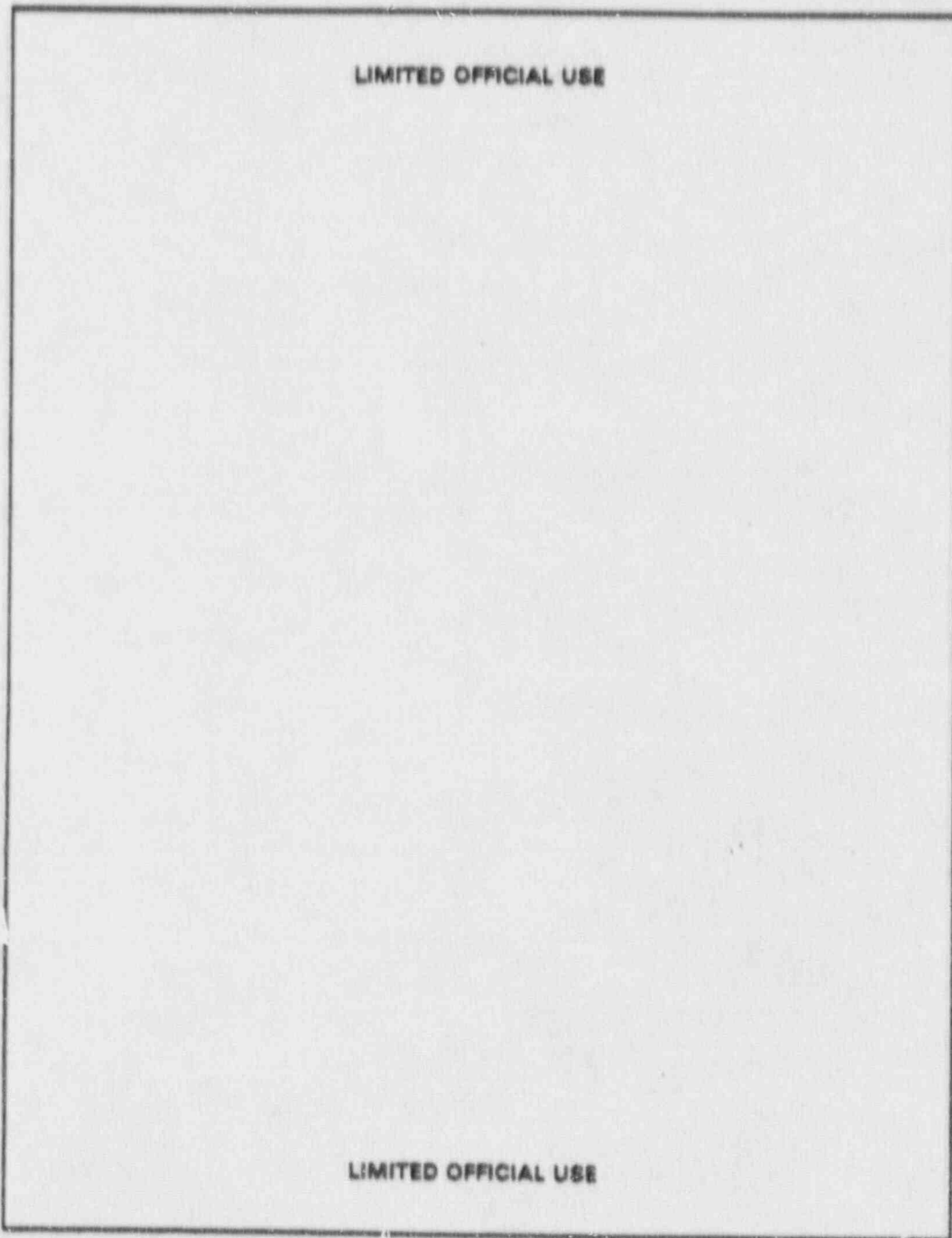


EXHIBIT 14
SAMPLE COVER FOR A CONTRACTOR REPORT CONTAINING
PROPRIETARY INFORMATION OBTAINED FROM A U.S. ORGANIZATION

PROPRIETARY INFORMATION

NUREG/CR-XXXX (P)

Title
Subtitle and Type of Report

Author(s), Editor(s)
Contractor
Prepared for
U.S. Nuclear Regulatory Commission

TRADE SECRET OR PRIVILEGED OR CONFIDENTIAL
COMMERCIAL OR FINANCIAL INFORMATION

This document contains information
submitted to NRC by

Name of Company and Name of Submitter

which has been determined (which is claimed)
to be proprietary in accordance with 10CFR
2.790 (b) (10CFR 2.5) (10CFR Part 21) and is
exempt from mandatory public disclosure pur-
suant to 10CFR Part 9

WITHHOLD FROM PUBLIC DISCLOSURE

Signature, Title and Office (Date)

PROPRIETARY INFORMATION

EXHIBIT 15
**SAMPLE COVER PAGE FOR A CONTRACTOR REPORT CONTAINING
PROPRIETARY INFORMATION OBTAINED FROM A FOREIGN SOURCE**

PROPRIETARY INFORMATION

NUREG/CR-XXXX (P)

Title
Subtitle and Type of Report

Author(s), Editor(s)
Contractor
Prepared for
U.S. Nuclear Regulatory Commission

FOREIGN INFORMATION
This document contains information
submitted to NRC by

(Name of Company and Name of Submitter)
which is described in 10CFR 2.790 (d)(2)
and is exempt from mandatory public disclosure
pursuant to 10CFR Part 8

WITHHOLD FROM PUBLIC DISCLOSURE

(Signature, Title and Office) (Date)

PROPRIETARY INFORMATION

EXHIBIT 16
SAMPLE TITLE PAGE FOR A CONTRACTOR REPORT CONTAINING
PROPRIETARY INFORMATION OBTAINED FROM A U.S. ORGANIZATION

PROPRIETARY INFORMATION

NUREG/CR-XXXX (P)

Title
Subtitle and Type of Report

Manuscript Completed: (date)
Date Published: (month, year)

Author(s), Editor(s)
Contractor name and address

Prepared for
Division
Office
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN No.

TRADE SECRET OR PRIVILEGED OR CONFIDENTIAL
COMMERCIAL OR FINANCIAL INFORMATION

The document contains information submitted
to NRC by

(Name of Company and Name of Submitter)

which has been determined (which is claimed)
to be proprietary in accordance with (10CFR
2.790 (b)) (10CFR 2.5) (10CFR Part 21) and is
exempt from mandatory public disclosure pur-
suant to 10CFR Part 9

WITHHOLD FROM PUBLIC DISCLOSURE

(Signature, Title and Office) (Date)

PROPRIETARY INFORMATION

EXHIBIT 17
SAMPLE TITLE PAGE FOR A CONTRACTOR REPORT CONTAINING
PROPRIETARY INFORMATION OBTAINED FROM A FOREIGN SOURCE

PROPRIETARY INFORMATION

NUREG/CR-XXXX (P)

Title
Subtitle and Type of Report

Manuscript Complete: (date)
Date Published: (month, year)

Author(s), Editor(s)

Manuscript Complete: (date)
Date Published: (month, year)

Author(s), Editor(s)
Contractor name and address

Prepared for
Division
Office
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC File No.

FOREIGN INFORMATION

This document contains information
submitted to NRC by

(Name of Company and Name of Submitter)
which is described in 10CFR 2.790 (d)(2)
and is exempt from mandatory public disclosure
pursuant to 10CFR Part 9

WITHHOLD FROM PUBLIC DISCLOSURE

(Signature, Title and Office) (Date)

PROPRIETARY INFORMATION

**EXHIBIT 18
SAMPLE BACK COVER FOR A CONTRACTOR REPORT CONTAINING
PROPRIETARY INFORMATION**

PROPRIETARY INFORMATION

PROPRIETARY INFORMATION

EXHIBIT 19
COVER SHEET FOR REPORT CONTAINING PROPRIETARY INFORMATION

PROPRIETARY INFORMATION

NOTICE

THE ATTACHED DOCUMENT CONTAINS "PROPRIETARY INFORMATION" AND SHOULD BE HANDLED AS NRC "OFFICIAL USE ONLY" INFORMATION. IT SHOULD NOT BE DISCLOSED OR MADE AVAILABLE TO ANY PERSON NOT REQUIRING SUCH INFORMATION IN THE CONDUCT OF OFFICIAL BUSINESS AND SHOULD BE STORED, TRANSFERRED, AND DISPOSED OF BY EACH RECIPIENT IN A MANNER WHICH WILL ASSURE THAT ITS CONTENTS ARE NOT MADE AVAILABLE TO UNAUTHORIZED PERSONS.

COPY. _____
DOCKET NO. _____
CONTROL. _____
REPORT. _____
REC'D W/LTR DTD. _____

PROPRIETARY INFORMATION

Approved: (1/28/84) 10, 1980

Approved: August 29, 1984

EXHIBIT 20
SAMPLE COVER FOR A CONTRACTOR REPORT CONTAINING
UNCLASSIFIED SAFEGUARDS INFORMATION

SAFEGUARDS INFORMATION

NUREG/CR-XXXX (SG)

Title
Subtitle and Type of Report

Author(s), Editor(s)
Contractor

Prepared for
U.S. Nuclear Regulatory Commission

The determination that this document contains
safeguards information was made by

(Name) (Title) (Organization)

Violation of 10 CFR 101.11 of 10 CFR
73.21 and/or of other of 10 CFR 73.21

SAFEGUARDS INFORMATION

EXHIBIT 21
SAMPLE TITLE PAGE FOR A CONTRACTOR REPORT CONTAINING
UNCLASSIFIED SAFEGUARDS INFORMATION

SAFEGUARDS INFORMATION

NUREG/CR-XXXX (L/G)

Title

Subtitle and Type of Report

Manuscript Completed: (date)
Date Published: (month, year)

Author(s), Editor(s)
Contractor name and address

Prepared for
Division
Office
U.S. Nuclear Regulatory Commission
Washington, D.C. 20545
NRC File No.

SAFEGUARDS INFORMATION

EXHIBIT 22
SAMPLE BACK COVER FOR A CONTRACTOR REPORT CONTAINING
UNCLASSIFIED SAFEGUARDS INFORMATION

SAFEGUARDS INFORMATION

SAFEGUARDS INFORMATION

EXHIBIT 23
COVER SHEET FOR A CONTRACTOR REPORT CONTAINING
UNCLASSIFIED SAFEGUARDS INFORMATION

SAFEGUARDS INFORMATION

THIS DOCUMENT CONTAINS INFORMATION WHICH MUST BE PROTECTED FROM UNAUTHORIZED DISCLOSURE. 10 CFR 73.21 AND SECTION 147, ATOMIC ENERGY ACT OF 1954 APPLY. VIOLATIONS ARE SUBJECT TO CIVIL OR CRIMINAL PENALTIES.

THIS DOCUMENT IS NOT TO BE LEFT UNATTENDED OR ACCESSIBLE TO UNAUTHORIZED PERSONS. WHEN NOT IN USE, IT MUST BE STORED IN A LOCKED SECURITY STORAGE CONTAINER.

IT IS YOUR RESPONSIBILITY TO PROTECT THE INFORMATION CONTAINED IN THIS DOCUMENT FROM COMPROMISE, THEFT OR UNAUTHORIZED DISCLOSURE.

SAFEGUARDS INFORMATION

PART VI

HANDLING OF UNCLASSIFIED INFORMATION ON NRC COOPERATIVE PROGRAMS WITH FOREIGN GOVERNMENTS AND ORGANIZATIONS AND WITH U.S. INDUSTRY

The Nuclear Regulatory Commission has requested that its Program Offices establish, to the extent feasible, cooperative nuclear safety research programs that involve either or both U.S. industry and foreign governments and organizations. Such involvement includes monetary contributions, information exchange, and comments on program plans and results. This is authorized in 42 U.S.C. 5801. To this end, international and U.S. industry agreements have been signed that provide for transmitting unclassified information from NRC to participants. These procedures apply only to NRC-managed work not programatically funded by DOE.

The interests of all NRC cooperative nuclear safety research program participants are served best by early, rapid dissemination for comment of information on these programs developed for NRC by NRC contractors. This can be accomplished by distribution of "Draft Preliminary Reports (or Codes)" for comment for a specified period of time, followed by issue as formal NUREG/CR reports, with the concurrence of the participants. Specific procedures for accomplishing these goals and for transmitting information prepared by the NRC and DOE facilities and contractors and their subcontractors working on these programs are presented in the following sections. The procedures detailed here have been agreed to by DOE and have been provided to the responsible DOE Operations Officers and NRC Program and Project Managers as guidance.

A. PREPARATION OF DRAFT PRELIMINARY REPORTS FOR COMMENT

The first issuance of information by a contractor shall be designated "Draft Preliminary Report (or Code)," and shall include the cover sheet shown in Exhibit 24.

The following notice is to be printed on the bottom of the cover sheet (Exhibit 24):

NOTICE

THIS DRAFT PRELIMINARY REPORT IS ISSUED ONLY TO PARTICIPANTS IN THE DESIGNATED COOPERATIVE PROGRAM

This report was prepared in contemplation of Commission action. It has not have received patent review and may contain information received in confidence. Therefore, the contents of this report should neither be disclosed to others nor reproduced, wholly or partially, unless written permission to do so has been obtained from the appropriate USNRC office. The recipient is requested to take the necessary action to ensure the protection of this report.

This notice has been agreed to by the legal staffs of both NRC and DOE and is not to be added to or changed. Any problem in this regard shall be brought to the attention of the NRC project manager, who will consult with the NRC legal staff.

The "Draft Preliminary Report (or Code)" shall be submitted by first class or express mail by the contractor to the NRC project manager, with the letter shown in Exhibit 25, in the number of copies specified by the project manager (in most instances this will be fewer than 20 copies). The contractor (DOE facility, contractor or subcontractor or other contractor) may retain copies only for internal use. DOE facilities and contractors and their subcontractors shall not distribute copies of this draft report to DOE/TIDC. Draft reports may be distributed to interested DOE program offices. Subsequent issues of the information shall also be designated "Draft Preliminary Report (or Code)" until the NRC project manager authorizes preparation of a NUREG/CR report.

"Draft Preliminary Reports (or Codes)" shall not be identified as NUREG/CR reports or carry any contractor report number or NRC distribution codes.

B. DISTRIBUTION BY NRC PROJECT MANAGERS

The NRC project manager will distribute the copies received only to (1) the participants in the program, (2) the NRC staff with a need-to-know, and (3) others authorized by the program or project manager. Transmittal to participants shall be by first class or express mail, including air mail to foreign participants. If premium cost mail services are to be used, a Division Director or comparable or higher authority must certify to the need on NRC Form 420, "Request for Premium Cost Mail Service." Premium cost mail is:

1. Express Mail, Priority Mail (First Class weighing more than 12 ounces)
2. International Expre. Mail (Air Mail weighing more than 10 ounces)

(See Chapter NRC-025L-006 and NRC Appendix 0255, Part V, Annex A)

C. COMMENT PERIOD AND ISSUANCE OF NUREG/CR REPORT

A minimum of six months will be allowed for comments and resolution of comments. At the end of the comment period, the NRC project manager shall, with the concurrence of the participants, authorize the contractor to issue the information as a NUREG/CR report in accordance with the provisions of this Chapter.

D. REPORT IDENTIFIERS

The "Draft Preliminary Reports (or Codes)" will be uniquely identified only by the Financial Identification Number (FIN) assigned by NRC and

the appropriate periodic notation, if any, included in the title (Exhibit 24). They shall not be given standard report nomenclature until the NRC project manager authorizes publication as a NUREG/CR report. At that time, the contractor may add its own designation below the NUREG/CR number, as shown in Exhibits 3 and 4.

E. MAILING TO PROGRAM PARTICIPANTS

The physical transmission of reports from NRC to program participants shall be handled by the Document Management Branch (DMB), Division of Technical Information and Document Control (TIDC), based on address labels of participants supplied by the project manager. The transmittal sheet shown in Exhibit 26 shall be used to transmit the documents and the labels to DMB.

F. SECURITY

If information included in the report or code has been determined to be sensitive unclassified or classified information (see statement of work) the procedures of Part V also apply. The report (or code) may not be classified solely for the purpose of limiting distribution to the participants.

EXHIBIT 24
SAMPLE COVER FOR A DRAFT PRELIMINARY REPORT (CODE)
FOR COMMENT

DRAFT PRELIMINARY REPORT (CODE) FOR COMMENT

FIN NO. _____

Title of Program

Subtitle for This Report, Including
Appropriate Periodic Notation, if Any
(e.g., First Quarter, Issue No. 1)

Prepared by (Name of DOE Facility, Contractor and/or
Subcontractors, if any)

for

U.S. Nuclear Regulatory Commission

NOTICE

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PARTICIPANTS IN THE DESIGNATED COOPERATIVE PROGRAM

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EXHIBIT 25
TRANSMITTAL LETTER FROM CONTRACTOR TO NRC PROJECT
MANAGER FOR DRAFT PRELIMINARY REPORT

TO: NRC Project Manager
SUBJECT: DRAFT PRELIMINARY REPORT (CODE) ON
(PROGRAM TITLE) FOR COMMENT

The enclosed "Draft Preliminary Report (Code)" is being submitted for comment. It is our understanding that the comment period shall extend six months from the date of mailing of the draft to the participants. Upon resolution of the comments after that period and with concurrence of the cooperative program participants, the NRC Program Manager will authorize publication of this report in the NUREG/CR series under the provisions of NRC Manual Chapter 1102 or 3202.

DOE Facility or Contractor Representative

EXHIBIT 26

TRANSMITTAL SHEET FOR REQUESTING
MAILING TO COOPERATIVE PROGRAM
PARTICIPANTS

Recipients: Addresses on attached labels

Method of Mailing:

- First Class Postal Service to U. S. addresses
- Express mail to U. S. addresses*
- Air mail to foreign addresses*
- Surface mail to foreign addresses
(may require up to three (3) months)

THIS MAILING CONTAINS NO PROPRIETARY INFORMATION OR OTHER
SENSITIVE UNCLASSIFIED INFORMATION

Special Instructions:

Individual Requesting Mailing:

Project Manager or High Authority

Enclosures:

1. Address labels
2. Documents to be mailed

*If premium cost mail services are to be used, a Division Director or comparable or higher authority must certify to the need on NRC Form 420, "Request for Premium Cost Mail Service," Premium cost mail is:

1. Express Mail, Priority Mail (First Class weighing more than 12 ounces)
2. International Express Mail (Air Mail weighing more than 10 ounces)

(See Chapter NRC 0255-058 and NRC Appendix 0255, Part V, Annex A)

**RELEASE TO PUBLISH UNCLASSIFIED NRC CONTRACTOR,
 CONSULTANT, OR CONFERENCE PROCEEDINGS REPORTS**

(Please Type or Print)

Obtain from the Technical Publications
 Section on 492-7963

2. FIN OR GRANT NUMBER
 (Do not list DOE contract number)

2. TITLE AND SUBTITLE (Type in full as shown on document)

4. AUTHORS (If more than three, name first author followed by "and others")

5. CONTRACTOR

MAILING ADDRESS (Number and Street, City, State and ZIP Code)

TELEPHONE NUMBER

6. TYPE OF DOCUMENT (Check appropriate box)

A. TECHNICAL REPORT

FORMAL

LETTER REPORT

B. CONFERENCE PAPER (If so, complete items (1), (2), and (3) below)

(1) TITLE OF CONFERENCE PAPER:

(2) DATE(S) OF CONFERENCE:

(3) LOCATION OF CONFERENCE:

C. OTHER (Indicate type of item)

7. DISTRIBUTION (List NRC stock location codes. Provide mailing labels for special distribution not covered by NRC codes. If NRC code, provide name and title also only if external, provide complete mailing address.)

YES NO

8. CERTIFICATION (ANSWER ALL QUESTIONS)

A. REFERENCE AVAILABILITY --

Is all material referenced in this report available to the public either through a public library, the Government Printing Office, the National Technical Information Service, or the NRC Public Document Room?
 If no, list the specific availability of a referenced document with the reference listing below.

SPECIFIC AVAILABILITY

B. COPYRIGHTED MATERIAL --

Does this report contain copyrighted material?
 If yes, attach a letter of release from the source that waives the copyright.

C. COMPUTER CODES

Does this report contain a computer code?
 If yes, does it comply with the standards in NRC Manual Chapter 5804, "Planning and Control of Assessment Data Processing (ADP) Resources"?

D. PATENT CLEARANCE

Does this report require patent clearance?
 If yes, the NRC Patent Council must signify clearance by signing below.

NRC PATENT COUNSEL (Type or Print Name)

SIGNATURE

DATE

E. INFORMATION REQUESTS --

Does this report contain any information, surveys, or data collection requests?

F. LICENSING REQUIREMENTS --

Does this report impose requirements on licensees?

9. AUTHORIZATION

ELAB AUTHORIZING OFFICIAL (if applicable)
 (Type or print name)

SIGNATURE

DATE

B. NRC RESPONSIBLE STAFF MEMBER
 (Type or print name)

SIGNATURE

OFF/DIV

TELEPHONE

MAIL STOP

DATE

NRC FORM 335
12-89
NRCM 1102
2201, 3202

U.S. NUCLEAR REGULATORY COMMISSION

BIBLIOGRAPHIC DATA SHEET

(See instructions on the reverse)

1. REPORT NUMBER
*(Assigned by NRC. Add Vol., Supp., Rev.,
and Addendum Numbers, if any.)*

2. TITLE AND SUBTITLE

3. DATE REPORT PUBLISHED
MONTH | YEAR

4. FIN OR GRANT NUMBER

5. AUTHOR(S)

6. TYPE OF REPORT

7. PERIOD COVERED *(Inclusive Dates)*

8. PERFORMING ORGANIZATION -- NAME AND ADDRESS *(If NRC, provide Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address; if contractor, provide name and mailing address.)*

9. SPONSORING ORGANIZATION -- NAME AND ADDRESS *(If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.)*

10. SUPPLEMENTARY NOTES

11. ABSTRACT *(200 words or less)*

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

13. AVAILABILITY STATEMENT

14. SECURITY CLASSIFICATION

(This Page)

(This Report)

15. NUMBER OF PAGES

16. PRICE

DO NOT PRINT THESE INSTRUCTIONS AS A PAGE IN THE NUREG REPORT

INSTRUCTIONS

NRC FORM 335, BIBLIOGRAPHIC DATA SHEET, IS BASED ON GUIDELINES FOR FORMAT AND PRODUCTION OF SCIENTIFIC AND TECHNICAL REPORTS, ANSI Z39.18-1987 AVAILABLE FROM AMERICAN NATIONAL STANDARDS INSTITUTE, 1430 BROADWAY, NEW YORK, NY 10018. EACH SEPARATELY BOUND REPORT--FOR EXAMPLE, EACH VOLUME IN A MULTIVOLUME SET--SHALL HAVE ITS UNIQUE BIBLIOGRAPHIC DATA SHEET.

- 1. REPORT NUMBER.** Each individually bound report must carry a unique alphanumeric designation (NUREG) assigned by the Regulatory Publications Branch, Division of Freedom of Information and Publications Services, in accordance with American National Standard ANSI Z39.23-1983, Standard Technical Report Number (STRN). Use uppercase letters, Arabic numerals, slashes, and hyphens only, as in the following examples: NUREG-0100, NUREG/CP-0010, NUREG/CR-0100, and NUREG/BR-0010. For reports in a series add Vol., Supp., Rev., and Addendum, when necessary. Add contractor cross-reference identification number (if any) below NUREG-series number, e.g., PNL-XXXX, SANDXX-XXXX, SAI-XXXX.
- 2. TITLE AND SUBTITLE.** Title should indicate clearly and briefly the subject (coverage) of the report; including any subtitle to the main title. When a report is prepared in more than one volume, repeat the primary title, add volume number and include subtitle for the specific volume. Use upper and lower case letters, but capitalize computer code names. Do not use acronyms and initialisms in titles; may be added in parenthesis.
- 3. DATE REPORT PUBLISHED.** Each report must carry a date indicating month and year published.
- 4. FIN OR GRANT NUMBER.** Insert the FIN or grant number under which report was prepared.
- 5. AUTHOR(S).** Give name(s) in conventional order (e.g., John R. Doe, J. Robert Doe). List author's affiliation if it is different from the performing organization.
- 6. TYPE OF REPORT.** State draft, final, preliminary, topical, technical, regulatory, annual, quarterly, etc.
- 7. PERIOD COVERED.** Add inclusive dates.
- 8. PERFORMING ORGANIZATION NAME AND MAILING ADDRESS.** Give name, street, city, state, and ZIP code. List no more than two levels of an organizational hierarchy. Display the name of the organization exactly as follows: Division, Office, Organization or Government agency, and address.
- 9. SPONSORING ORGANIZATION.** If NRC, type "Same as above"; if contractor, provide NRC Division, Office or Region, U.S. Nuclear Regulatory Commission, and mailing address.
- 10. SUPPLEMENTARY NOTES.** Enter information not included elsewhere but useful, such as: Prepared in cooperation with ... Presented at conference of ... To be published ... Docket No. ... When a report is revised, indicate whether the new report supersedes or supplements the older report.
- 11. ABSTRACT.** Include a brief (200 words or less) factual summary of the most significant information contained in the report. If the report contains a significant bibliography or literature survey or multiple volumes, mention it here. Abstract is to be prepared by author or project manager.
- 12. KEY WORDS/DESCRIPTORS.** Select from the Energy Data Base Subject Thesaurus, DOE/TIC-700R R-5, the proper authorized terms that identify the major concept of the research and are sufficiently specific and precise to be used as index entries for cataloging.
- 13. AVAILABILITY STATEMENT.** Denote public releasability, for example "unlimited", or limitation for reasons other than security.
- 14. SECURITY CLASSIFICATION.** Enter U.S. Security Classification in accordance with U.S. Security Regulations (i.e., unclassified).
- 15. NUMBER OF PAGES.** Leave blank. (Added by NTIS)
- 16. PRICE.** Leave blank. (Added by NTIS)

STANDARD FORM 1411 WITH INSTRUCTIONS

1. SF 1411 provides a vehicle for the offeror to submit to the Government a pricing proposal of estimated and/or incurred costs by contract line item with supporting information, adequately cross-referenced, suitable for detailed analysis. A cost-element breakdown, using the applicable format prescribed in 7A, B, or C below, shall be attached for each proposed line item and must reflect any specific requirements established by the Contracting Officer. Supporting breakdowns must be furnished for each cost element, consistent with offeror's cost accounting system.

When more than one contract line item is proposed, summary total amounts covering all line items must be furnished for each cost element. If agreement has been reached with Government representatives on use of forward pricing rates/factors, identify the agreement, include a copy, and describe its nature. Depending on offeror's system, breakdowns shall be provided for the following basic elements of cost, as applicable:

Materials - Provide a consolidated priced summary of individual material quantities included in the various tasks, orders, or contract line items being proposed and the basis for pricing (vendor quotes, invoice prices, etc.).

Subcontracted Items - Include parts, components, assemblies, and services that are to be produced or performed by others in accordance with offeror's design, specifications, or direction and that are applicable only to the prime contract. For each subcontract over \$500,000, the support should provide a listing by source, item quantity, price, type of subcontract, degree of competition, and basis for establishing source and reasonableness of price, as well as the results of review and evaluation of subcontract proposals when required by FAR 15.806.

Standard Commercial Items - Consists of items that offeror normally fabricates, in whole or in part, and that are generally stocked in inventory. Provide an appropriate explanation of the basis for pricing. If price is based on cost, provide a cost breakdown; if priced at other than cost, provide justification for exemption from submission of cost or pricing data, as required by FAR 15.804-3(e).

Interorganizational Transfer (at other than cost) - Explain pricing method used. (See FAR 31.205-26).

Raw Material - Consists of material in a form or state that requires further processing. Provide priced quantities of items required for the proposal.

Purchased Parts - Includes material items not covered above. Provide priced quantities of items required for the proposal.

Interorganizational Transfer (at cost) - Include separate breakdown of cost by element.

Direct Labor - Provide a time-phased (e.g., monthly, quarterly, etc.) breakdown of labor hours, rates, and cost by appropriate category, and furnish bases for estimates.

Indirect Costs - Indicate how offeror has computed and applied offeror's indirect costs, including cost breakdowns, and showing trends and budgetary data, to provide a basis for evaluating the reasonableness of proposed rates. Indicate the rates used and provide an appropriate explanation.

Other Costs - List all other costs not otherwise included in the categories described above (e.g., special tooling, travel, computer and consultant services, preservation, packaging and packing, spoilage and rework, and Federal excise tax on finished articles) and provide bases for pricing.

Royalties - If more than \$250, provide the following information on separate page for each separate royalty or license fee: name and address of licensor; date of license agreement; patent numbers, patent application serial numbers, or other basis on which the royalty is payable; brief description (including any part or model numbers of each contract item or component on which the royalty is payable); percentage or dollar rate of royalty per unit; unit price of contract item; number of units; and total dollar amount of royalties. In addition, if specifically requested by the Contracting Officer, provide a copy of the current license agreement and identification of applicable claims of specific patents. (See FAR 27.204 and 31.205-37).

Facilities Capital Cost of Money - When the offeror elects to claim facilities capital cost of money as an allowable cost, the offeror must submit Form CASB-CMF and show the calculation of the proposed amount (see FAR 31.205-10).

2. As part of the specific information required, the offeror must submit with offeror's proposal, and clearly identify as such, cost or pricing data (that is, data that are verifiable and factual and otherwise as defined at FAR 15.801). In addition, submit with offeror's proposal any information reasonably required to explain offeror's estimating process, including:
 - a. The judgmental factors applied and the mathematical or other methods used in the estimate, including those used in projecting from known data; and
 - b. The nature and amount of any contingencies included in the proposed price.
3. There is a clear distinction between submitting cost or pricing data and merely making available books, records, and other documents without identification. The requirement for submission of cost or pricing data is met when all accurate cost or pricing data reasonably available to the offeror have been submitted, either actually or by specific identification, to the Contracting Officer or an authorized representative. As later information comes into the offeror's possession, it should be promptly submitted to the Contracting Officer. The requirement for submission of cost or pricing data continues to the time of final agreement on price.

4. In submitting offeror's proposal, offeror must include an index, appropriately referenced, of all the cost or pricing data and information accompanying or identified in the proposal. In addition, any future additions and/or revisions, up to the date of agreement on price, must be annotated on a supplemental index.
5. By submitting offeror's proposal, the offeror, if selected for negotiation, grants, the Contracting Officer or an authorized representative the right to examine those books, records, documents, and other supporting data that will permit adequate evaluation of the proposed price. This right may be exercised at any time before award.
6. As soon as practicable after final agreement on price, but before the award resulting from the proposal, the offeror shall, under the conditions stated in FAR 15.804-4, submit a Certificate of Current Cost or Pricing Data.
7. Headings for Submission of Line-Item Summaries:
 - A. New Contracts (including Letter contracts).

Cost Elements	Proposed Contract Estimate-Total Cost	Proposed Contract Estimate-Unit Cost	Reference
(1)	(2)	(3)	(4)

Under Column (1) - Enter appropriate cost elements.

Under Column (2) - Enter those necessary and reasonable costs that in offeror's judgment will properly be incurred in efficient contract performance. When any of the costs in this column have already been incurred (e.g., under a letter contract or unpriced order), describe them on an attached supporting schedule. When preproduction or startup costs are significant, or when specifically requested to do so by the Contracting Officer, provide a full identification and explanation of them.

Under Column (3) - Optional, unless required by the Contracting Officer.

Under Column (4) - Identify the attachment in which the information supporting the specific cost element may be found. Attach separate pages as necessary.

8. Change Orders (modifications).

Cost Elements	Estimated Cost of All Work Deleted	Cost Of Deleted Work Already Performed	Net Cost To Be Deleted	Cost Of Work Added	Net Cost Of Change	Reference
(1)	(2)	(3)	(4)	(5)	(6)	(7)

Under Column (1) - Enter appropriate cost elements.

Under Column (2) - Include (i) current estimates of what the cost would have been to complete deleted work not yet performed, and (ii) the cost of deleted work already performed.

Under Column (3) - Include the incurred cost of deleted work already performed, actually computed if possible, or estimated in the Contractor's accounting records. Attach a detailed inventory of work, materials, parts, components, and hardware already purchased, manufactured, or performed and deleted by the change, indicating the cost and proposed disposition of each line item. Also, if offeror desires to retain these items or any portion of them, indicate the amount offered for them.

Under Column (4) - Enter the net cost to be deleted which is the estimated cost of all deleted work less the cost of deleted work already performed. Column (2) less Column (3) = Column (4).

Under Column (5) - Enter the offeror's estimate for cost of work added by the change. When nonrecurring costs are significant, or when specifically requested to do so by the Contracting Officer, provide full identification and explanation of them.

Under Column (6) - Enter the net cost of change which is the cost of work added, less the net cost to be deleted. When this result is negative, place the amount in parentheses. Column (4) less Column (5) = Column (6).

Under Column (7) - Identify the attachment in which the information supporting the specific cost element may be found. Attach separate pages as necessary.

C. Price Revision/Redetermination

Cutoff Date	Number of Units Completed	Number of Units To Be Completed	Contract Amount	Redetermina- tion Proposal Amount	Difference
(1)	(2)	(3)	(4)	(5)	(6)

Cost Elements	Incurred Cost- Preproduc- tion	Incurred Cost- Completed Units	Incurred Cost- Work In Process	Total Incurred Cost	Estimated Cost To Complete	Estimated Total Cost	Reference
(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)

Under Column (1) - Enter the cutoff date required by the contract, if applicable.

Under Column (2) - Enter the number of units completed during the period for which experienced costs of production are being submitted.

Under Column (3) - Enter the number of units remaining to be completed under the contract.

Under Column (4) - Enter the cumulative contract amount.

Under Column (5) - Enter the offeror's redetermination proposal amount.

Under Column (6) - Enter the difference between the contract amount and the redetermination proposal amount. When this result is negative, place the amount in parenthesis. Column (4) less Column (5) = Column (6).

Under Column (7) - Enter appropriate cost elements. When residual inventory exists, the final costs established under fixed-price-incentive and fixed-price-redeterminable arrangements should be net of the fair market value of such inventory. In support of subcontract costs, submit a listing of all subcontracts subject to repricing action, annotated as to their status.

Under Column (8) - Enter all costs incurred under the contract before starting production and other nonrecurring costs (usually referred to as startup costs) from offeror's books and records as of the cutoff date. These include such costs as preproduction engineering, special plant rearrangement, training program, and any identifiable nonrecurring costs such as initial rework, spoilage, pilot runs, etc. In the event the amounts are not segregated in or otherwise available from offeror's records, enter in this column offeror's best estimates. Explain the basis for each estimate and how the costs are charged on offeror's accounting records

(e.g., included in production costs as direct engineering labor, charged to manufacturing overhead, etc.). Also how the costs would be allocated to the units at their various states of contract completion.

Under Columns (9) and (10) - Enter in Column (9) the production costs from offeror's books and records (exclusive of preproduction costs reported in Column (8) of the units completed as of the cutoff date. Enter in Column (10) the costs of work in process as determined from offeror's records or inventories at the cutoff date. When the amounts for work in process are not available in Contractor's records but reliable estimates for them can be made, enter the estimated amounts in Column (10) and enter in Column (9) the differences between the total incurred costs (exclusive of preproduction costs) as of the cutoff date and these estimates. Explain the basis for the estimates, including identification of any provision for experienced or anticipated allowances, such as shrinkage, rework, design changes, etc. Furnish experienced unit or lot costs (or labor hours) from inception of contract to the cutoff date, improvement curves, and any other available production cost history pertaining to the item(s) to which offeror's proposal relates.

Under Column (11) - Enter total incurred costs (Total of Columns (8), (9), and (10)).

Under Column (12) - Enter those necessary and reasonable costs that in Contractor's judgment will properly be incurred in completing the remaining work to be performed under the contract with respect to the item(s) to which Contractor's proposal relates.

Under Column (13) - Enter total estimated cost (Total of Columns (11) and (12)).

Under Column (14) - Identify the attachment in which the information supporting the specific cost element may be found. Attach separate pages as necessary.

CONTRACT PRICING PROPOSAL COVER SHEET

1. SOLICITATION/CONTRACT/MODIFICATION NO.

FORM APPROVED
OMB NO.
3090-0116

NOTE: This form is used in contract actions if submission of cost or pricing data is required. (See FAR 15.804-6(b))

2. NAME AND ADDRESS OF OFFEROR (Include ZIP Code)

3A. NAME AND TITLE OF OFFEROR'S POINT OF CONTACT

3B. TELEPHONE NO.

4. TYPE OF CONTRACT ACTION (Check)

A. NEW CONTRACT

D. LETTER CONTRACT

B. CHANGE ORDER

E. UNPRICED ORDER

C. PRICE REVISION/
REDETERMINATION

F. OTHER (Specify)

5. TYPE OF CONTRACT (Check)

FFP

CPFF

CPIF

CPAF

FPI

OTHER (Specify)

6. PROPOSED COST (A+B=C)

A. COST

B. PROFIT/FEE

C. TOTAL

\$

\$

\$

7. PLACE(S) AND PERIOD(S) OF PERFORMANCE

8. List and reference the identification, quantity and total price proposed for each contract line item. A line item cost breakdown supporting this recap is required unless otherwise specified by the Contracting Officer. (Continue on reverse, and then on plain paper, if necessary. Use same headings.)

A. LINE ITEM NO.	B. IDENTIFICATION	C. QUANTITY	D. TOTAL PRICE	E. REF.

9. PROVIDE NAME, ADDRESS, AND TELEPHONE NUMBER FOR THE FOLLOWING (If available)

A. CONTRACT ADMINISTRATION OFFICE

B. AUDIT OFFICE

10. WILL YOU REQUIRE THE USE OF ANY GOVERNMENT PROPERTY IN THE PERFORMANCE OF THIS WORK? (If "Yes," identify)

YES NO

11A. DO YOU REQUIRE GOVERNMENT CONTRACT FINANCING TO PERFORM THIS PROPOSED CONTRACT? (If "Yes," complete Item 11B)

YES NO

11B. TYPE OF FINANCING (Check one)

ADVANCE PAYMENTS

PROGRESS PAYMENTS

GUARANTEED LOANS

12. HAVE YOU BEEN AWARDED ANY CONTRACTS OR SUBCONTRACTS FOR THE SAME OR SIMILAR ITEMS WITHIN THE PAST 3 YEARS? (If "Yes," identify item(s), customer(s) and contract number(s))

YES NO

13. IS THIS PROPOSAL CONSISTENT WITH YOUR ESTABLISHED ESTIMATING AND ACCOUNTING PRACTICES AND PROCEDURES AND FAR PART 31 COST PRINCIPLES? (If "No," explain)

YES NO

14. COST ACCOUNTING STANDARDS BOARD (CASB) DATA (Public Law 91-379 as amended and FAR PART 30)

A. WILL THIS CONTRACT ACTION BE SUBJECT TO CASB REGULATIONS? (If "No," explain in proposal)

YES NO

B. HAVE YOU SUBMITTED A CASB DISCLOSURE STATEMENT (CASB DS-1 or 2)? (If "Yes," specify in proposal the office to which submitted and if determined to be adequate)

YES NO

C. HAVE YOU BEEN NOTIFIED THAT YOU ARE OR MAY BE IN NON-COMPLIANCE WITH YOUR DISCLOSURE STATEMENT OR COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)

YES NO

D. IS ANY ASPECT OF THIS PROPOSAL INCONSISTENT WITH YOUR DISCLOSED PRACTICES OR APPLICABLE COST ACCOUNTING STANDARDS? (If "Yes," explain in proposal)

YES NO

This proposal is submitted in response to the RFP contract, modification, etc. in Item 1 and reflects our best estimates and/or actual costs as of this date.

15. NAME AND TITLE (Type)

16. NAME OF FIRM

17. SIGNATURE

18. DATE OF SUBMISSION

CONTRACTOR SPENDING PLAN - INSTRUCTIONS

The Contractor Spending Plan (CSP) is an important tool for projecting and tracking contract costs and progress each task under the contract.

Applicability

The Nuclear Regulatory Commission (NRC) requires that the CSP be completed for cost reimbursement contracts when the award amount is expected to exceed \$100,000 and the period of performance is expected to exceed 6 months. For task order type contracts, a CSP is required when an individual cost reimbursement task order is expected to exceed the above thresholds. When a contract or task order modification increases the contract or task order amount of a cost reimbursement contract or task order to over \$100,000 and the period of performance from the effective date of the modification to the contract or task order expiration exceeds 6 months, a CSP is required for all contract work to be performed after the effective date of the modification.

Submission

1. A CSP is required:
 - a. as part of the cost proposal for a cost reimbursement contract or individual task order, or modification to a contract or task order which meets the above thresholds;
 - b. as part of the Best and Final Offer (if requested) as a result of negotiations;
2. Updated CSP information is required on a monthly basis or as approved by the CO as part of the "Financial Status Report" (Ref: Section F.3, "Financial Status Report").

Format

The attached CSP sample format may be duplicated and used by the Contractor, or modified to permit more accurate reporting or to meet other needs of the contractor. For instance, the sample format provides space to report projected costs for 12 months, but the contractor may wish to alter the sample format for shorter or longer contract/task order periods. The contractor may also wish to alter the sample format for ease of typing or automated production. So long as complete information is provided on actual and projected costs or accomplishments, changes to the format to improve relevance to the circumstances are encouraged.

It is up to the discretion of the offeror to determine the appropriate level of cost detail to be presented based on the complexity of the effort. This plan reflects only the minimum requirements for submission of cost details which will be considered for completeness, reasonableness, and as a measure of effective management of the effort. The Contracting Officer reserves the right to request additional cost information, if deemed necessary.

NUREG-0650

Technical Writing Style Guide

Compiled by: A. Savolainen, R. H. Feldmann, W. E. Olu, M. H. Singh

Division of Technical Information and Document Control
Office of Administration

U.S. Nuclear Regulatory
Commission



NOTICE

Availability of Reference Materials Cited in NRC Publications

Most documents cited in NRC publications will be available from one of the following sources:

1. The NRC Public Document Room, 1717 H Street, N.W., Washington, DC 20555
2. The Superintendent of Documents, U.S. Government Printing Office, Post Office Box 37082, Washington, DC 20013-7082
3. The National Technical Information Service, Springfield, VA 22161

Although the listing that follows represents the majority of documents cited in NRC publications, it is not intended to be exhaustive.

Reference documents available for inspection and copying for a fee from the NRC Public Document Room include NRC correspondence and internal NRC memoranda; NRC Office of Inspection and Enforcement bulletins, circulars, information notices, inspection and investigation notices; Licensee Event Reports; vendor reports and correspondence; Commission papers; and applicant and licensee documents and correspondence.

The following documents in the NUREG series are available for purchase from the GPO Sales Program: formal NRC staff and contractor reports, NRC-sponsored conference proceedings, and NRC booklets and brochures. Also available are Regulatory Guides, NRC regulations in the Code of Federal Regulations, and Nuclear Regulatory Commission issuances.

Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, former nuclear agency to the Nuclear Regulatory Commission. Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactional, Federal Register notices, federal and state legislation, and congressional reports and translations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

Single copies of NRC draft reports are available free, to the extent of supply, upon written request to the Division of Information Support Services, Distribution Section, U.S. Nuclear Regulatory Commission, Washington, DC 20555.

Copies of industry codes and standards used in a substantive manner in the NRC regulatory process are maintained at the NRC Library, 7820 Norfolk Avenue, Bethesda, Maryland, and are available there for reference use by the public. Codes and standards are usually copyrighted and may be purchased from the originating organization or, if they are American National Standards, from the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018.

NOTICE

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Documents available from the National Technical Information Service include NUREG series reports and technical reports prepared by other federal agencies and reports prepared by the Atomic Energy Commission, forerunner agency to the Nuclear Regulatory Commission.

Documents available from public and special technical libraries include all open literature items, such as books, journal and periodical articles, and transactions, *Federal Register* notices, federal and state legislation, and congressional reports can usually be obtained from these libraries.

Documents such as theses, dissertations, foreign reports and translations, and non-NRC conference proceedings are available for purchase from the organization sponsoring the publication cited.

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Technical Writing Style Guide

Date Published: November 1979

Compiled by: A. Sevolainan, R. H. Feldmann, W. E. Ollu, M. H. Singh

Division of Technical Information and Document Control
Office of Administration
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555



ABSTRACT

This style guide provides recommended guidelines to NRC staff and contractors as they prepare draft and final staff and contractor documents. Detailed information on report content and organization is presented with examples.

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PREFACE

This document provides recommended guidelines for the preparation of draft and final staff and contractor documents (see Glossary for definitions) for the U.S. Nuclear Regulatory Commission (NRC). Both the objectives and organization of technical reports are discussed. Use of the guidelines recommended in this guide will improve information exchange between contractors and the NRC staff, provide a uniform format to aid staff and contractors in preparing reports, and produce consistency in documentation procedures. Properly reported work serves as source material for NRC regulatory actions, and the report is a legal record of completion of contract requirements.

Guidelines presented in this document will help improve the reliability of NRC reports. However, variations of these guidelines are also acceptable. Guidance presented here was adopted from national standards common to most technical publications. The ORNL Style Guide (May 1974) and ASL Technical Information Manual (April 1977) proved useful in the compilation of this NRC Technical Writing Style Guide.

ACKNOWLEDGMENTS

Many individuals contributed to this compilation through preparation of the initial draft and comments made during the review process. The initial draft was prepared by Leslie Casey, now of the Office of Nuclear Regulatory Research, and the following members of the Office of Nuclear Materials Site Safety and Safeguards: Nadia Dayem, Daniel Fehring, Mark Grayson, Michael Kearney, Dave Rohrer, Stephen Schreurs, and George Wu. The comments of Edward L. Hill and Carol Peabody of the Office of Standards Development and William J. Maher of the Office of Management and Program Analysis were particularly helpful.

Appreciation is due to Walter Olliv and his colleagues who generously permitted use of material from their book "Handbook of Technical Writing," by Charles T. Brusaw, Gerald J. Alred, and Walter Olliv, St. Martin's Press, New York, 1976.

Comments on the index by Ms. Wendy Osborne are gratefully acknowledged.

TECHNICAL WRITING STYLE GUIDE

1. INTRODUCTION

The basic requirements for staff and contractor documents are given in NRC Manual Chapters 3201, 3202, and 1102.*

This style guide, Part III of MC 3201, provides recommended guidance for U.S. Nuclear Regulatory Commission staff and contractors in the preparation of draft and final documents. The objectives of this style guide are to:

- Improve document readability,
- Standardize document format,
- Ensure consistency of staff and contractor documents,
- Ensure completeness of documents,
- Facilitate information retrieval,
- Ensure complete source documentation.

Documents directed toward a technical audience should be written on a level understandable by an individual with a basic understanding of nuclear engineering principles. Documents directed toward a general audience should be written for the educated layman.

Include explanatory statements that provide background information on specialized subjects, unless lengthy, in the document. If longer than one or two pages, include such statements in an appendix.

In general, references cited in NRC documents must be available to the public. See Appendix A of this guide for proper indication of availability.

2. GENERAL FORMAT

Organize formal reports (including drafts)** as follows using only those elements appropriate to the report:

<u>Element</u>	<u>Page Number</u>	<u>Right- or Left-Hand Page</u>
Title page	None	Right
Previous Documents in Series	None	Left
Abstract	iii	Right

*Copies of these Manual Chapters can be obtained from the Division of Technical Information and Document Control, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

**See Glossary for definitions of Formal Staff and Contractor Reports.

<u>Element</u>	<u>Page Number</u>	<u>Right- or Left-Hand Page</u>
Back of Abstract Page (blank)	None	Left
Contents	v	Right
List of Figures	Small Roman (odd or even)	Right or left
List of Tables	Small Roman (odd or even)	Right or left
Preface (or Foreword)	Small Roman (odd)	Right
Acknowledgments	Small Roman (odd)	Right
Nomenclature	Small Roman (odd)	Right
Executive Summary	First page unnumbered, but considered Arabic 1. Numbered consecutively thereafter in Arabic numerals.	Right
Introduction	Continue consecutive numbering with Arabic numerals.	Right
Text	Continue consecutive numbering with Arabic numerals.	Right
References	Continue consecutive numbering with Arabic numerals.	Right
Bibliography	Continue consecutive numbering with Arabic numerals.	Right or left
First and Subsequent Appendices	Continue consecutive numbering with Arabic numerals.	Right for first; right or left for secondary
Glossary	Continue consecutive numbering with Arabic numerals.	Right
Index	Continue consecutive numbering with Arabic numerals.	Right

New chapters or major subdivisions may begin on a new left- or right-hand page. Assign odd numbers to right-hand pages and even numbers to left-hand pages.

3. FRONT MATTER

3.1 Cover (Formal Reports)

The cover, made of heavy, protective paper, should contain (1) the title of the document, (2) the author's name(s), (3) the type of document (for example, draft, final, task force), and (4) the NRC report number. (See MC 3201, 3202, and 1102 for additional information and sample covers.)

3.2 Title Page (Formal and Interim Reports)

The title page should include (1) the title of the document, (2) the author's name(s), (3) the date of submission and publication, (4) document and contract numbers, (5) a status statement (if applicable), (6) the authorization (that is, the division ordering the work to be done), (7) the NRC division or office sponsoring the document, and (8) the NRC FIN number, if applicable. (See MC 3201, 3202, and 1102 for additional information and sample title pages for formal and interim reports.)

3.3 Previous Documents in Series

If the document being prepared is one in an ongoing series, list all previous documents in the series. Include document numbers and issuance dates. Place this list on the back of the title page.

3.4 Abstract

Prepare an abstract of 200 words or less for each formal document (draft and final) and place it on a separate page between the list of previous documents in the series and the contents pages. The abstract should address the major points of the document, including the investigations the document covers, and any findings, conclusions, and recommendations. The first sentence of the abstract should state the subject of the document.

Be concise; do not use words and ideas that are either repetitious or unnecessary. Take care, however, to include articles (a, an, the) and transitional words important to the document's readability (for example, moreover, nevertheless, however, but).

3.5 Contents

In the contents, list the title and page number of each section of the document. Carry subheadings to at least the second degree of subordination. The subheadings serve essentially as an outline of the document. In the absence of an index, information retrieval is greatly enhanced by including the highest degree of subordination in the contents that appears in the text. (See contents of this document as an example.) Ensure that the page numbers and wording of chapter and section titles are identical with those in the text.

3.6 List of Figures

Include a separate page listing figures if there are five or more figures in the document. The figure numbers and captions should correspond to those in the text. A list of figures is unnecessary for conference proceedings or symposium compilations.

3.7 List of Tables

Include a separate page listing tables if there are five or more tables in the document. The table numbers and titles should correspond to those in the text. Such a list is unnecessary for conference proceedings or symposium compilations.

3.8 Preface (or Foreword)

A preface is an optional introductory statement about a document written by the author. A foreword is an introductory statement written by someone other than the author. A preface highlights the relationship of the work to the NRC program. If a preface or foreword is not included, place this optional material in the introduction (see Section 4.3).

3.9 Acknowledgments

The document may include a section giving credit to any persons or groups who assisted in preparing the report. If the acknowledgment is not lengthy, it may be included as part of the preface; otherwise acknowledgments should appear separately, following the preface. If the document does not contain a preface, place the acknowledgment page immediately preceding the text.

3.10 Nomenclature

3.10.1 Abbreviations and Symbols

When reference to a list of abbreviations and symbols would be useful to your audience, list the abbreviations and symbols in a separate section. Such a list is particularly helpful to the reader of a large document because, even if the abbreviation or symbol is explained the first time it appears in the text, it is easier for the reader to find it in a listing than to find the first place it appears in the text. See Appendix B for guidelines on the preparation of such lists.

The nomenclature list, labeled as such, should appear as the last section of the front matter, on a new right-hand page. Abbreviations and symbols commonly used in NRC documents appear in Appendix B. Less familiar words and terms may also be abbreviated in the text if the abbreviation is explained where it first occurs. When you are uncertain about how to abbreviate a word, write it out. Be aware that some abbreviations stand for more than one term; A, for example, represents both ampere and angstrom. If the context makes such overlapping abbreviations intelligible, use them; otherwise, spell out those terms that have identical abbreviations if they occur in the same report.

Note these rules for abbreviations. Abbreviate units of measure, quantity, and time only when they are preceded by a numeral; use the percent symbol (%) only with numerals. An abbreviation is the same whether singular or plural (3 kg, 25 kg) unless it is in all-capital form such as RV, "reentry vehicle," which becomes "RVs." Abbreviate "accelerations of gravity" to "gs" to distinguish it from "g" for "grams."

Do not use double prefixes. Write ns, not μ s, for nanosecond; GW, not kW, for gigawatt; and pF, not μ F, for picofarad. Use μ m for micrometer; micron (μ) should not be used.

When a prefix is placed before the symbol of a unit, the combination may be regarded as a single symbol that can be raised to a positive or negative power without using brackets; thus, mm^3 , and μs^{-1} . Remember that mm^3 means $(0.001 \text{ m})^3$, not 0.001 m^3 , and that μs^{-1} means $(10^{-6}\text{s})^{-1}$, not 10^{-6}s^{-1} .

Further guidance on the proper use of abbreviations and symbols is presented in the U.S. Government Printing Office Style Manual, Chapters 9 and 10.

3.10.2 Definitions of Variables

A separate list should be included in the nomenclature section to define by name and unit of measure all variables used in mathematical expressions in the document. This list is particularly helpful to the reader of a large document because, even if the variable is properly defined in the text when first used, it is easier for the reader to find in a listing of variables than to find the first place it is defined in the text.

3.10.3 Acronyms and Initialisms

List acronyms and initialisms in alphabetical order in the abbreviations and symbols list. An acronym is a pronounceable term formed from the initial letters or parts of a compound expression, such as rem (roentgen equivalent man), and FORTRAN (formula translation). An initialism is an unpronounceable abbreviation formed from the initial letters of a compound expression, such as FFTF (Fast Flux Test Facility) or ac (alternating current). To be sure that readers will recognize the acronym or initialism, enclose it in parentheses after the expression to which it refers. Thereafter, use the acronym or initialism only. When it is first used in the document abstract, reidentify an acronym in its first appearance. Acronyms for computer programs and many acronyms not adopted into the language as words are written in full capitals. For a listing of acronyms and initialisms common to nuclear engineering, see NRC's "A Handbook of Acronyms and Initialisms" (NUREG-0544).

3.10.4 Chemical Elements

Spell out the names of elements used as modifiers, such as "beryllium spacers" and "copper coating." Do not capitalize the initial letter when spelling out the element name.

Use element symbols when giving an exact chemical formula (H_2SO_4) or alloy composition. Use "Uranium-238" at the beginning of a sentence; otherwise, use

" Ca^{40} ." Do not place a period after a symbol unless it appears at the end of a sentence.

Indexes placed around the symbol indicate mass number (upper left), atomic number (lower left), state of ionization or nuclear excited state (upper right), and number of atoms (lower right). Usually the atomic number may be omitted; for example, ^{12}C may be written ^{12}C . Indicate the ionic charge by a superscript plus or minus sign following the symbol of the ion. For multiple charges, a superscript Arabic numeral precedes the plus or minus sign, for example, Co^{2+} , Hg^{2+} , Pu^{2+} . Show a metastable state by the upper left index, for example, $^{110\text{m}}\text{Ag}$. To show an electronic excited state, use an upper right asterisk, He^* .

4. TEXT

4.1 Title of Document

Since the title of your document is the first thing your reader sees, it should indicate the specific topic and suggest the document's scope and objective. Titles that are either too vague or unnecessarily long prevent efficient information retrieval by researchers and librarians, who often have only a title on which to decide whether or not to obtain a document.

Too Vague: "Approved Category A Task Action Plans"

Preferred: "Plans for Resolving Unresolved LWR Safety and Environmental Issues"

Too Wordy: "Office of Nuclear Reactor Regulation Technical Report on Operating Experience with BWR Pressure Relief Systems"

Preferred: "Operating Experience with BWR Pressure Relief Systems"

Announcing the NRC program office in the title is unnecessary because that information will appear elsewhere on the report cover.

If the report covers a specific period of time (quarterly, annual), identify this fact in a subtitle.

OCCUPATIONAL RADIATION EXPOSURE Annual Report for 1978

Do not use "Report on ..." or "Technical Report on ..." in the title, since that information will be self evident.

Avoid abbreviations in report titles, especially if the abbreviations come from fields outside of nuclear engineering.

Confusing: "LEA Response Capabilities"

Preferred: "Local Law Enforcement Agency Response Capabilities"

Center the title of the document at the top of the first page of the text, like an appendix or chapter title.

4.2 Executive Summary

Documents (other than short summary reports) should include a 500- to 1000-word executive summary of major findings, conclusions, and recommendations (if any) of the document. The summary states the purpose and nature of the investigation. It also provides a brief account of the procedures used and a concise overview for persons in management positions. Although more complete than an abstract, the summary should not contain a detailed description of the work upon which the findings, conclusions, and recommendations are based. The summary section immediately follows the title of the document on the first text page. (See Manual Chapter 1102.)

4.3 Introduction

4.3.1 Objective

The introduction should state the goals and objectives of the work done. This statement should answer two questions: What was the objective of the study, and why was the study done?

4.3.2 Scope and Limitations

The introduction should define the scope and limitations of the study, and specify boundary conditions explicitly. The reader should be able to ascertain quickly what the study does and does not investigate.

4.3.3 Organizational Paragraph

The introduction may include a paragraph that expresses the relationship of each chapter or appendix to the overall study objective.

4.4 Body

4.4.1 General Requirements

4.4.1.1 Audience

Documents directed toward a technical audience should be written on a level understandable by an individual with a basic knowledge of nuclear engineering principles. Documents directed toward a general audience should be written for the educated layman.

Include explanatory statements that provide background information on specialized subjects, unless lengthy, in the document. If longer than one or two pages, include such statements in an appendix. (See Section 4.4.1.3, Length of Text.)

4.4.1.2 Transition

Use transition as a means of linking ideas in a document so that their relationship to one another is clear. Use of transitional words and phrases leads the reader smoothly from idea to idea throughout the text.

Certain words and expressions are inherently transitional:

hence, therefore, consequently, for example, specifically,
furthermore, also, however, accordingly, in summary, to conclude

You can use these and similar expressions to achieve transition between sentences and paragraphs, as in this example (where transitional words and phrases are underlined):

XYZ, Inc., continued to provide support for the communication analysis effort during this quarter. In December, XYZ final reports entitled "Transportation Safeguards System and Network Analysis Model II" and "Evaluation of Transportation Safeguards" were received at the laboratory. These reports present the results of analysis for Task II, Task III, and Task IV of the five-task XYZ contract. A briefing on the Task III and Task IV results was given to laboratory representatives by the XYZ staff on 15 November. At that time, a decision was made to present these results to NRC at the beginning of the next quarter.

Communication analysis for next quarter, however, will focus on....

4.4.1.3 Length of Text

The text should focus on the report's stated objective. Place ancillary or essential background information, such as lengthy tables and derivations, in an appendix, especially if the explanations are longer than two pages.

4.4.1.4 Overall Consistency

When several different authors write sections of final documents, assign one overall editor to integrate the material and leave a document with a consistent writing style.

4.4.2 Content

4.4.2.1 Method

This section should describe the method chosen to carry out the study, the advantages of this method, and how the stated objectives are met.

4.4.2.2 Assumptions

Include a complete list of the assumptions used and the justification for using them. Discuss any alternative assumptions that were evaluated but dismissed and give the reasons for their dismissal. Describe the effect of assumptions on the applicability of the study or the level of confidence of

the results. Describe nontrivial mathematical operations in detail and provide an explanation of the methodology used and why it was chosen.

4.4.2.3 Results

State results objectively. Show how they follow from the study objectives and methodology. Point out unexpected results both in the results section and in the summary section of the report.

4.4.2.4 Analysis and Conclusions

Describe the method used to interpret the results. The conclusions should state the significance of the results in relation to the stated problem. In presenting the conclusions, include a statement on the level of confidence in the conclusions. Make clear where the use of subjective judgment or expert opinion was used. Clearly identify speculative or nonsubstantiated assertions.

4.4.2.5 Recommendations

Indicate the course of action recommended based on the interpretation of the study results. Include in the recommendations, if appropriate, suggested methods for obtaining additional information and a justification for obtaining such information.

4.4.3 Chapters

Include a title and an introductory paragraph for each chapter (or major section). Indicate in the introductory paragraph what material is covered in the chapter and the relationship of the material covered in the chapter to the overall document.

Place references at the end of the whole report in a separate section or at the end of sections or chapters if the document is lengthy.

4.4.4 In-Text Referencing

Should more than one section of the same document require in-text referencing, give the proper reference notation in the text at the point where the reference is made (see Appendix A). Use references both to give proper credit for previous work and to guide the reader to sources. When directing readers to information in appendixes or other sections of the document, place such direction in parentheses, such as (see Appendix A). The reference should be as specific as possible and include page number(s) if necessary.

4.4.5 Incorporating Quoted Material in the Text

Material quoted word for word from another document can be incorporated into the text in one of two ways. To highlight quoted information because of its significance, set it off from the text by indenting five spaces from the left margin and five spaces from the right margin and by double spacing above and below the passage. Inset quoted passages are single spaced and are not enclosed in quotation marks. Quoted passages that do not require highlighting are "run in" to the text and are enclosed in quotation marks.

Lacking other guidance, use the following rule of thumb for when to and when not to indent. Incorporate quotations of five lines or fewer into the text, enclosing them in quotation marks. Set off quotations longer than five lines; do not enclose them in quotation marks.

4.5 Pagination

Paginate all documents as indicated in Section 2, General Format, of this style guide.

4.6 Identification of Equations and Artwork

Uniquely identify all artwork and important or referenced equations.

4.6.1 Equations

Number displayed equations sequentially by chapter, such as (1-1), (1-2), . . . (2-1), (2-2), . . . , at the right margin aligned with the equation or the last line of the equation and refer to them in the text as Eq. 1-1, Eq. 1-2, etc. . . . Number equations in appendixes (A-1), (A-2), . . . at the right margin and refer to them in the text as Eq. A-1, Eq. A-2. . . . Appendix C of this style guide contains additional information on displaying mathematical equations.

If there are no numbered chapters, equations may be numbered sequentially (1, 2, 3, . . .) and referred to in text as Eq. 1, Eq. 2, . . .

4.6.2 Artwork

Section 6 and Appendix D of this style guide contain information on the identification of artwork (figures, photographs, etc.) and on the preparation of such material.

4.7 Footnotes

Use footnotes in the body of the document only for explanatory material. If the material is extensive, place it in a separate appendix rather than in a footnote. Cite literature used in the preparation of a document and referred to in the text in the reference section. (See Appendix A for reference guidelines.)

Place footnotes at the bottom of the text page between the last line of text and the page number; that is, the last line of the footnote should be on the bottom line of the image area. (Based on an 8½ x 11-inch page size, the allowable image area would be 6½ x 9 inches.) Double space between the last line of text and the first line of the footnote. A 1¼-inch or 20-space line should appear above the first footnote on each page.

Use single, double, or triple asterisks or daggers to mark footnotes in the text and at the bottom of the page.

Use footnotes in tables and graphs for explanations of individual items in the table. Use symbols (a, f) or lower-case letters, rather than numbers, to key

footnotes where numbers could be mistaken for tabulated information. Orient footnote symbols from left to right and from top to bottom.

4.8 Computer Material

Technical documents include two general categories of computer material: computer program descriptions and computer output. Computer program descriptions explain either how a program is developed or how a program is used in an analysis. Computer output presents the results of an analysis.

4.8.1 Computer Program Description

4.8.1.1 Explanation of Program Development

Present the explanation of program development in the text of a document. Clearly identify the approach, assumptions, scope, and limitations of the program. The approach includes topics such as numerical solution techniques, basic theory, mathematics, and approximations (for example, curve fitting). Give a clear explanation of why a particular approach was used. Present long derivations in appendixes.

4.8.1.2 Explanation of Program Use

Include the following information when using an already-existing program to provide input to a document:

- (1) An explanation of how and why the program was used (in text).
- (2) The scope and limitations of the program (in text).
- (3) A program summary (in one appendix for all the program summaries).
- (4) Documentation (either as an appendix or as a reference to an available document).

4.8.2 Computer Output

When computer output is used in a document, clearly label the output and provide a high-quality copy (that is, a reproducible copy). Include with the copy an explanation of the program used to generate the output (see Section 4.8.1.2) and an explanation or listing of the inputs used to generate the output.

4.9 Report Mechanics

Appendix E of this style guide contains information on the following:

- (1) Chapter (or section) dividers
- (2) Paper
- (3) Appearance
- (4) Pagination
- (5) Spelling
- (6) Preferred usage

5. BACK MATTER

5.1 References

Cite references that are accurate and pertinent to the subject. Do not list references with which you are not personally familiar. Ensure that all references used in a document are properly credited, and that the references are complete enough to allow a reader to locate the sources. (See Appendix A for specific guidelines.)

Do not cite explanatory material as a reference. Present such materials in a footnote or appendix or incorporate them into the text.

Consult Chemical Abstracts Service Source Index (CASSI) or the Bibliographic Guide for Editors and Authors for abbreviations and spelling of journal names. (See Section 8, Bibliography, for full references to these works.)

5.1.1 Format

Number citations of source documents consecutively in the order in which they appear in the text. Identify references by Arabic numerals in parentheses, such as (Ref. 1). Cite references in tables or figures completely. Do not cite references in titles or abstracts, however. Type multiple-line citations single spaced, and double space between citations. Type the second and subsequent lines of an entry flush with the same margin as the first line, so that the reference number stands out. (See Appendix A for guidelines on how to cite specific references.)

To re-cite a reference in the text, simply repeat its text reference number. Appendixes that cite references should have their own reference lists. Spell out "reference" when you identify a specific source in a text sentence: "The data in Reference 3 include ..." Abbreviate "reference" when it appears in text parenthetically (Ref. 3).

5.1.2 Availability Requirement

The provisions of 10 CFR § 2.740 and 10 CFR § 9.4 require that source material in NRC regulatory and technical documents be readily available to the public in the NRC Public Document Room (PDR) or available from a public library. Accordingly, present references in a format recognizable by a librarian. References to information not available in the open literature should state where the document can be purchased or copied. Do not use sources that are not publicly available, such as "unpublished data," "personal communications," or "internal documents." If such a source is pertinent and necessary, include information from it in a brief paragraph in the text, in a footnote, or in an appendix. (See Appendix A for guidelines.)

5.1.3 Proprietary and Classified Documents

When using nonproprietary or unclassified (or declassifiable) information contained in proprietary or classified documents as source material, insert the information in the body of the text or in a footnote to the text, copy and

place the information in an appendix, or abstract and make the information available for inspection and copying for a fee at the NRC Public Document Room and then cite it as a reference to the text.

Citing classified or proprietary documents is strongly discouraged; in some instances, however, reference to classified or proprietary documents cannot be avoided because they are the only source for certain information. Even though the documents must be withheld from the public, make the public aware that such documents served as the bases for the information. Accordingly, reference proprietary and classified documents when necessary. (Omit the title if the title is classified.) This type of reference should include a statement such as the following: "This document is not publicly available because it contains proprietary or national security information."

5.1.4 Copyrighted Material in NRC Publications

To quote from copyrighted material in an NRC publication to be made available to the public, you must obtain permission from the copyright holder. (The copyright holder is usually the publisher of the book or journal.) Permission is usually granted if the usage will not harm the author or prejudice sale of the copyrighted material. If permission is not granted, or if you cannot determine who holds the copyright, contact the Patent Counsel of the Office of the Executive Legal Director.

To obtain permission, send the copyright holder either a copyright release form or a brief note. (Copyright release forms are available from the Policy and Publications Management Branch of the Division of Technical Information and Document Control.) If the copyright release must be obtained quickly, secure permission over the telephone. Upon approval, confirm the release by sending the holder a copyright release form that should be signed and sent back to the NRC office making the request.

When permission to reproduce the work has been obtained, cite the copyright holder in a source or credit line where the information is referenced. If the holder does not request a particular credit line, use the following:

Permission to use this copyrighted material was granted by [name of copyright holder].

5.2 Bibliography

List citations of other documents pertinent to the subject but not referenced in the text in a bibliography. Arrange bibliographic entries alphabetically by personal or corporate author name. In general, most NRC documents need not have bibliographic sections unless the study required a literature search.

The bibliography, labeled as such, should follow the last reference section in the text and begin on a new page, either right or left. (See Appendix F for a sample bibliography.)

5.3 Appendices

The appendices should comprise information that is supplemental to the report. The types of material to be placed in the appendices are (1) explanations too long for footnotes but helpful to the reader seeking further assistance or clarification, (2) passages from documents or laws that support or illustrate the text, or (3) long charts, tables, or computer printouts.

Place the first appendix on the first right-hand page directly after the reference section or bibliography. Begin each additional appendix on a new page, either right or left. Identify each appendix by an appendix heading and title (for example, Appendix B, Nomenclature in a Report). When there is more than one appendix in a document, sequence them in the order in which they are referred to in the text. A reference to Appendix B, for example, should not precede the first text reference to Appendix A.

The contents of each appendix should be identifiable without referring back to the body of the document. An introductory paragraph describing the appendix contents is therefore necessary for many appendices, including those containing computer printouts, data tables, or similar information. Outline lengthy appendices or those containing information on several topics in the table of contents (see front matter of this document). If several symbols or abbreviations are used in the appendix (as in a mathematical derivation), identify them in a nomenclature section following the introduction of the appendix. When only a few symbols or abbreviations are used, identify them where they are used in the body of the appendix. Compile and list materials cited in an appendix at the end of the appendix in a separate reference section.

5.4 Glossary

Include a glossary if the document contains many terms that might be unfamiliar to the intended audience. Arrange terms alphabetically, with each new entry beginning on a new line. Definitions should follow the term on the same line, dictionary style. Place the glossary, labeled as such, directly after the appendix, beginning on a new right-hand page, or before the nomenclature or the introduction section, beginning a new page.

5.5 Index

A report index lists, in alphabetical order, all pertinent topics discussed in a report and cites the page number(s) where the topic can be found within the report text. The index, labeled as such, should appear as the last section of a report and begin on a right-hand page.

The main purpose of an index is to make a report more useful by allowing the reader to look up a topic or topics alphabetically. The key to creating a useful index is to choose those terms that best represent the report's pertinent topics.

To create an index, select the pertinent terms from the final version of the document manuscript. Enter each term on a 3x5-inch index card and arrange the cards in alphabetical order. Each time a term appears in the text, enter

its page number on the index card. When you have completed this process, have the index section typed from this set of cards.

Index entries are divided into headings that concisely specify a particular subject discussed within the text and their page references. A complete entry consists of the principal entry, subentries and cross-references, if any, as indicated in the following example:

Monitoring programs, 27-49	<u>Heading</u>	
aquatic, 42		
ecological, 40		
meteorological, 37	<u>Subheading</u>	
radiological, 30		
terrestrial, 41, 43-44		
thermal, 27		
staff evaluation and recommendations, 45-49		<u>Sub-subheading</u>

Each subentry in the index appears on a separate line, indented from the main entry to which it refers. Sometimes a sub-subentry is needed and is indented from the preceding subentry.

Cross-references are devices inserted at appropriate places in the index to guide the reader to the complete information in the text. They consist of two general kinds - "see" references and "see also" references. "See" references are used when the indexer has chosen among several key words:

Economic costs. See benefit-cost analysis.

when the subject has been treated as a subentry to a principal entry:

Radiological impacts. See environmental effects of station operation, radiological impacts.

or when reference is from a popular or shortened form of a term to the "official," scientific or full form:

China syndrome. See reactor core meltdown.

"See also" references are used when additional information can be found in another entry or subentry.

Ecological programs, 40-49. See also monitoring programs.

The index in this style guide is an example of the indented style, where each subentry begins a new line and is indented from the left. The indented style is recommended for detailed subjects because the indentations allow the reader to scan a column quickly for pertinent subentries.

6. TABLES AND ILLUSTRATIONS

The primary purpose of including tables and illustrations in your writing is to increase your reader's understanding of what you are saying in ways that words alone cannot. Pictures show shapes and relationships in space far

better than even the most skillful description. Graphs show trends and mathematical relationships in ways that are immediately grasped. Tables allow easy comparisons between large numbers of statistics that would be difficult to understand written in sentence form. Many of the qualities of good writing - simplicity, clarity, conciseness, directness - are equally important in creating and using illustrations and tables.

Copyrighted graphics information cannot be reproduced in NRC publications without written permission from the copyright holder. To secure permission from the copyright holder, obtain a copyright release form from the Policy and Publications Management Branch of the Division of Technical Information and Document Control.

When permission to reproduce the work has been granted, cite the person or organization that holds the copyright in a source or courtesy note. (See Table D.1, Appendix D for an example of a source line.)

8.1 Tips for Creating Tables and Illustrations

The following general guidelines apply to most visual materials. Detailed guidelines for specific types of illustrations are given with the discussion of each type:

- (1) Keep the information as brief and simple as possible.
- (2) Try to present only one type of information in each illustration.
- (3) Label or caption each illustration clearly.
- (4) When necessary, include a key that identifies all symbols.
- (5) When appropriate, specify the proportions used, or include a scale of relative distances.
- (6) Keep terminology consistent. Do not refer to something as a "proportion" in the text and as a "percentage" in the illustration.
- (7) Allow enough white space around and within the illustration for easy viewing.
- (8) Position the illustration as close as possible to the text that refers to it; however, an illustration should never appear ahead of the first text reference to it.
- (9) Be certain that the significance of each illustration is clear from the text.
- (10) If several illustrations or tables are used, number the illustrations or tables consecutively.
- (11) If more than five illustrations or tables appear in a formal report, list them, together with figure and page numbers, under a separate heading

following the table of contents, labeled "List of Figures" or "List of Tables."

If presented with clarity and consistency, illustrations can help the reader focus on key portions of the report. Even the best illustration only supplements the text, however. The writing team provides the context for the illustration and point out its significance. Appendix D provides detailed guidance on the creation of tables and illustrations.

6.2 Availability of Existing Graphics Works at NRC

Standardized graphics works on many technical and regulatory topics already exist in camera-ready form for use in publications and in the preparation of Yu Graphs. Check with your branch chief, with the Special Projects Branch (OHPA), or with the Printing and Graphics Branch for the availability of pertinent maps, tables, graphs, photographs, organizational charts, and the like.

7. MATHEMATICS

7.1 writing Numbers

Authors must often decide whether to use numerals or to spell out a number. Appendix C provides rules based on the principle that readers comprehend numerals more readily than spelled-out numbers. Some rules, however, are based on typographic appearance.

7.2 Typing Mathematical Material

Type all mathematical material. For more specific information dealing with equations, refer to Appendix C (Section 4, Displayed Equations).

8. BIBLIOGRAPHY

Brusaw, C. T., G. J. Alred, and W. E. Olfu. Handbook of Technical Writing. New York: St. Martin's Press Inc., 1976. Available from St. Martin's Press, Inc., 175 Fifth Avenue, New York, NY 10010.

Chemical Abstracts Service. Bibliographic Guide for Editors and Authors, Biosciences Information Service of Biological Abstracts. American Chemical Society, 1974. Available from public and technical libraries.

Chemical Abstracts Service. Chemical Abstracts Service Source Index (CASST), 1907-1974 Cumulative, 2 vols. American Chemical Society, 1974. Available from public and technical libraries.

U.S. Government Printing Office. Style Manual. Washington, DC: U.S. Government Printing Office, January 1973. Available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

U.S. Nuclear Regulatory Commission. "A Handbook of Acronyms and Initialisms." USNRC Report NUREG-0544, March 1979. Available for purchase from the National Technical Information Service, Springfield, VA 22161.

U.S. Nuclear Regulatory Commission. "Manual Chapter 3201, Publication of Unclassified NRC Staff-Generated Regulatory and Technical Documents." Washington, DC: U.S. Nuclear Regulatory Commission, June 27, 1977. Available from NRC Division of Technical Information and Document Control, Document Management Branch.

U.S. Nuclear Regulatory Commission. "Manual Chapter 3202, Publication of Unclassified Regulatory and Technical Documents Prepared by NRC Contractors, Including Reports Prepared Under or Pursuant to Interagency Agreements." Washington, DC: U.S. Nuclear Regulatory Commission, January 25, 1978. Available from NRC Division of Technical Information and Document Control, Document Management Branch.

U.S. Nuclear Regulatory Commission. "Manual Chapter 1102, Procedure for Placement of Work with the Department of Energy." Washington, DC: U.S. Nuclear Regulatory Commission, to be issued. Available from NRC Division of Technical Information and Document Control, Document Management Branch.

APPENDIX A
EXAMPLES OF REFERENCE CITATIONS

1. INTRODUCTION

This appendix provides guidelines for the preparation of reference citations. For references requiring the same availability statement, place the statement(s) at the bottom of the page in a footnote rather than repeating the statement in each pertinent reference.

2. EXAMPLES OF REFERENCE CITATIONS

2.1 Correspondence

References to letters or memoranda should clearly indicate originator and the recipient.

Letter from D. B. Blackman, Georgetown Municipal Utility, to R. A. Gilbert, NRC, Subject: Answers to NRC Questions on Docket 50-625, dated January 31, 1975. Available in NRC PDR for inspection and copying for a fee.

Memorandum from D. F. Ross and D. G. Eisenhut, NRC, to D. B. Vassallo and K. R. Goller, "Interim Safety Evaluation Report on the Effects of Fuel Rod Bowing on Thermal Margin Calculations for Light Water Reactors," December 8, 1976. Available in NRC PDR for inspection and copying for a fee.

2.2 Internal Papers

Do not reference internal papers, such as technical notes and minutes of meetings, unless they are already available in the NRC Public Document Room (PDR) or will be made available in the PDR before issuance of the report. For a technical note, list author (if any), title, and date, and state that it is "available in the NRC PDR for inspection and copying for a fee." The same format is applicable to minutes of meetings. Do not reference calculations and working papers. If the information in them is pertinent to the text of the report, make it part of the report as text, footnote, or appendix.

2.3 Personal Communications, Private Communications, Notes on Visits

Do not cite references of the following type.

J. G. Facer, ERDA Grand Junction Office, personal communication to M. B. Sears, Oak Ridge National Laboratory, December 16, 1975.

Staff visit to the Exxon mine waste dump, Converse County, Wyoming, April 12, 1972.

In both instances, place these remarks directly in the text (or as a footnote) because they do not represent any retrievable information.

2.4 Procedures Manuals

Do not reference procedures manuals unless the manuals are available for inspection and copying by the public. Give sufficient information in the citation to indicate where they can be obtained. If specific procedures are pertinent, repeat them in the text without reference to specific documents.

2.5 Federal Agency Documents and Drafts that Have Been Made Available to the Public for Comment

When referencing specific pages, insert volume and page numbers following the title; for example, Vol. 4, pp. 10-20, 500-730.

For draft reports:

U.S. Nuclear Regulatory Commission. "Review and Assessment of Package Requirements (Yellowcake) and Emergency Response to Transportation Accidents," USNRC Draft Report NUREG-0535, March 1979. Single copies are available from USNRC Division of Technical Information and Document Control, Washington, DC 20555.

For final reports:

U.S. Nuclear Regulatory Commission, "Reactor Safety Study - An Assessment of Accident Risks in U.S. Commercial Nuclear Power Plants," Executive Summary, WASH-1400 (NUREG-75/014), October 1975. Available for purchase from National Technical Information Service, Springfield, Virginia 22161.

U.S. Nuclear Regulatory Commission, "Final Generic Environmental Statement on the Use of Recycle Plutonium in Mixed Oxide Fuel in Light Water Cooled Reactors," USNRC Report NUREG-0002, Vols. 1-5, August 1976. Available for purchase from National Technical Information Service, Springfield, Virginia 22161.

R. O. Meyer, "The Analysis of Fuel Densification," p. 48, USNRC Report NUREG-0085, July 1976. Available for purchase from National Technical Information Service, Springfield, Virginia 22161.

For NRC Safety Standard Review Plan:

U.S. Nuclear Regulatory Commission, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants - LWR Edition," USNRC Report NUREG-75/087, Section 2.3.1, "Regional Climatology," Rev. 1. Available for purchase from National Technical Information Service, Springfield, Virginia 22161.

References to Regulatory Guides should carry neither the date of issuance nor the revision number. The basic format for draft Regulatory Guides is as follows:

U.S. Nuclear Regulatory Commission. Draft Regulatory Guide, Task OH 717-4. "Radiation Protection Training for Light-Water-Cooled Nuclear Power Plant Personnel." Single copies are available from the USNRC Division of Technical Information and Document Control, Washington, D.C. 20555.

The basic format for active Regulatory Guides is as follows:

U.S. Nuclear Regulatory Commission, Regulatory Guide 1.31, "Control of Ferrite Content in Stainless Steel Weld Metal." Copies are available from U.S. Government Printing Office, Washington, D.C. 20402. ATTN: Regulatory Guide Account.

2.6 NRC Contractor Reports and Reports Prepared on Intergency Agreements

For formal reports:

R. J. Bruns, F. P. Roberts, and U. L. Upson, Battelle Pacific Northwest Laboratories, "Considerations for Sampling Nuclear Material for SMH Accounting Measurements," USNRC Report NUREG/CR-6087, May 1978. Available for purchase from National Technical Information Service, Springfield, Virginia 22161.

For interim reports:

G. L. Sordner and others, "Pretest Analysis SLSF In-Reactor Experiment 62," USNRC Accession No. 771090001, prepared for NRC by Argonne National Laboratory, October 1976. Available in NRC PDR for inspection and copying for a fee.

2.7 NRC Applicant Documents

Exxon Nuclear Corporation, "Preliminary Safety Analysis Report, Nuclear Fuel Recovery and Recycling Center," Vol. 3, p. 5.4-3, Docket 50-860, June 1976. Available in NRC PDR for inspection and copying for a fee.

2.8 Project Documents

For project documents, use the format given in Section 2.7 and replace the docket number with the project number.

2.9 Licensee Documents

For licensee documents, use the format given in Section 2.7 for applicant documents and use the docket number or the license number.

2.10 Congressional Hearings, Reports, Acts, and Testimony

To cite legal references, follow examples set forth in A Uniform System of Citation, Harvard Law Review Association, Cambridge, Massachusetts, 1976, 12th edition. (Reference copies are available from the NRC Law Library.)

2.11 Federal Register Notices

U.S. Nuclear Regulatory Commission, "Licensing Procedures for Geologic Repositories for High-Level Radioactive Wastes," Federal Register, Vol. 43, No. 223, Nov. 17, 1978, 53869-53872.

2.12 ~~Notes~~

S. Glasstone, Sourcebook on Atomic Energy, p. 155, D. Van Nostrand Co., Inc. New York, 1974.

When a book consolidates various articles as chapters in the book, use the following reference format.

K. A. Gschneidner, Jr., and J. T. Waber, "Principles of the Alloying Behavior of Rare-Earth Metals," in The Rare Earths, F. H. Spedding and A. M. Deane, Eds. (John Wiley and Sons, Inc., New York, 1961), Chap. 17, pp. 386-427.

2.13 Conference Papers

Do not reference unpublished conference papers. Incorporate the information being used in the text and give credit to the originator in the text or in a footnote. If the originator can supply a paper, place it in an appendix and mention it in the text. (For further information on conference documentation, refer to Manual Chapter 3207, Conferences and Conference Proceedings, Ref. 2.)

Reference published conference papers as follows:

E. B. Norris and J. S. Perrin, "Determination and Evaluation of the Mechanical Properties of Specimens in Commercial LWR Pressure Vessel Surveillance Programs," Vols. 3, p. 1113 in Proceedings of the Second ASTM-EURATOM Symposium on Reactor Dosimetry: Dosimetry Methods for Fuels, Cladding, and Structural Materials, USNRC Conference Proceeding NUREG/CP-0004, Vol. 3, Oct. 1977. Available for purchase from the National Technical Information Service, Springfield, VA 22161.

2.14 Journal, Magazine, and Newspaper Articles

S. D. Shoarer and C. W. Still, "Evaluation of Atmospheric Radon in the Vicinity of Uranium Mill Tailings," Health Physics 17, 77-88 (1976). Available in public technical libraries.

"Why the Nuclear Power Race Worries the U.S.," p. 68, Business Week, August 23, 1976. Available in public libraries.

"Argentina Says It Has Atom Fuel to Triple Its Electrical Capability," p. 53, The New York Times, August 31, 1976. Available in public libraries.

2.15 University Theses

J. J. Jacobs, "Programming Language 1 for the Varian PLCU," Master's Thesis, p. 70, North Carolina University, 1971.

2.16 Foreign Reports

P. M. S. Jones, "The Physical Stability of Metal Tritides, Lithium Tritide, and Deuterotritides." Atomic Weapons Research Establishment report AWRE-O-27/67, Aldermaston, England (June 1967).

2.17 Encyclopedia Articles

S. P. Johnston, "Airplane," Encyclopaedia Britannica (1968).

(Because the articles are arranged alphabetically, volume and page numbers are unnecessary. If the entry does not list an author, begin the reference with the article title.)

2.18 Translations

V. L. Bouche-Bruvich, Electronic Theory of Heavily Doped Semiconductors (American Elsevier, 1966, translation), 131 pp.

2.19 Codes and Standards

"American National Standard Requirements for Collection, Storage and Maintenance of Quality Assurance Records for Nuclear Power Plants," ANSI N43.2.9-1974. Available from American National Standards Institute, 1430 Broadway, New York, NY 10018, Copyrighted.

"American National Standard Guidelines on the Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants," ANSI/ANS-1.4-1977. Available from American National Standards Institute, 1430 Broadway, New York, NY 10018, Copyrighted.

2.20 Patents

N. J. Entdecker, "Autoheuristic Hypothesizer," US Patent No. 4 321 098, November 1970.

3. BIBLIOGRAPHY

U.S. Nuclear Regulatory Commission. "Manual Chapter, 3202, Publication of Unclassified Regulatory and Technical Documents Prepared by NRC Contractors, Including Reports Prepared Under or Pursuant to Interagency Agreements." Washington, DC: U.S. Nuclear Regulatory Commission, January 25, 1978. Available from NRC Division of Technical Information and Document Control, Document Management Branch.

U.S. Nuclear Regulatory Commission. "Manual Chapter 3207, Conferences and Conference Proceedings." Washington DC: U.S. Nuclear Regulatory Commission, September 12, 1978. Available from NRC Division of Technical Information and Document Control, Document Management Branch.

APPENDIX B

NOMENCLATURE IN A REPORT

1. INTRODUCTION

This appendix provides lists of symbols, abbreviations, and acronyms commonly used in NRC reports. If your document requires the use of uncommon terms, compile this type of information in a nomenclature list. Include in the list only those abbreviations, symbols, or acronyms actually used in the report, arranged alphabetically.

2. ABBREVIATIONS, SYMBOLS, AND ACRONYMS

Use the abbreviation for a unit of measure only when it is preceded by a numeral. Do not start a sentence with an abbreviation. Use periods following abbreviations only as shown in this section or when the abbreviation forms a word. "A Handbook of Acronyms and Initialisms" (NUREG-0544), listing the information commonly used in NRC reports, is available from NRC's Division of Technical Information and Document Control.

absolute.....	abs
acceleration of gravity.....	g (plural, gs)
alpha (prompt multiplication rate).....	α (gen/us)
alternating current.....	ac
altitude.....	alt
azegat.....	spell out
ampere.....	A
ampere per meter.....	A/m
ampere-turn per meter.....	At/m
amplitude modulation.....	AM
angstrom.....	Å
antilogarithm.....	antilog
antilogarithm, natural.....	antiln
appendix (appendixes).....	App. (Apps.)
approximate, approximately.....	approx
approximately equal to.....	\approx
atmosphere (unit).....	atm
atomic demolition unit.....	ADM
atomic mass units.....	amu
atomic number.....	Z, at. No.
atomic units.....	a.u.
atomic weight.....	a, at. wt
audiofrequency (adj.).....	af
average.....	av
bar.....	spell out
barn.....	b
basic assembly.....	BA
becquerel.....	Bq
billion electron volts.....	GeV, BeV
biot.....	Bi
body-centered cubic.....	bcc
Bohr.....	spell out

Bohr magneton..... μ_B
 boiling point.....bp
 Brinell hardness number.....Bhn
 British thermal unit.....Btu
 calculated.....calc
 calorie.....cal
 candela.....cd
 candela per square meter..... cd/m^2
 capacitance.....C
 cathode-ray tube.....CRT
 Celsius.....C
 center of gravity.....c.g.
 centigram.....cg
 center of mass.....c.m.
 centimeter.....cm
 centimeter-gram-second (unit system).....cgs
 centimeter per second.....cm/s
 centipoise.....cP
 chapter.....Chap.
 chemically pure.....cp
 coefficient.....coeff
 cologarithm.....colog
 complex conjugate.....c.c.
 concentrated, concentration.....conc
 constant.....const
 contact potential difference.....cpd
 continued.....cont.
 continuous wave.....cw
 coulomb (A·s).....C
 counts per minute.....counts/min
 counts per second.....counts/s
 cubic.....cu
 cubic centimeter..... cm^3 (not cc)
 cubic meter..... m^3
 cubic millimeter..... mm^3
 curie.....Ci
 cycle.....spell out
 cycles per second.....Hz
 day.....spell out
 debye.....D
 decibel.....dB
 degree..... $^\circ$, deg
 degree Celsius..... $^\circ\text{C}$
 density.....p, d
 Department of Energy.....DOE
 derivative.....deriv
 diameter.....diam
 difference, is similar to.....~
 direct current.....dc
 disintegration per second.....dis/s
 drawing number.....Dwg No.
 dyne.....dyn
 east.....E

edition(s), editor(s).....Ed. (Eds.)
 efficiency.....eff
 electromagnetic pulse.....EMP
 electromagnetic units.....emu
 electromotive force.....emf
 electron.....e
 electron paramagnetic resonance.....EPR
 electron spin resonance.....ESR
 electron units.....e.u.
 electron volt.....eV
 electrostatic units.....esu
 entropy unit.....eu
 equation(s).....Eq. (Eqs.)
 equivalent.....equiv
 erg.....erg
 erg second.....erg-s
 error function.....erf
 error function complement.....erfc
 experiment(s).....expt(1)
 exponent, exponential.....exp
 face-centered cubic.....fcc
 Fahrenheit.....F
 farad (A-s/V).....F
 femtometer.....fm
 Fermi (10⁻¹⁵ meters).....F
 figure(s).....Fig. (Figs.)
 fissions per second.....f/s
 freezing point.....fp
 frequency.....freq
 high.....hf
 low.....lf
 medium.....mf
 superhigh.....shf
 ultrahigh.....uhf
 very high.....vhf
 very low.....vlf
 frequency modulation.....FM
 full width at half maximum.....FWHM
 function, hyperbolic
 cosecant.....cosh
 cosine.....cosh
 cotangent.....coth
 secant.....sech
 sine.....sinh
 tangent.....tanh
 function, trigonometric
 cosecant.....csc
 cosine.....cos
 cotangent.....cot
 coversine.....covers
 exsecant.....exsec
 haversine.....hav
 secant.....sec

sine.....	sin
tangent.....	tan
versine.....	vers
gauss.....	G
Geiger-Mueller (or Muller).....	G-M
generations per microsecond.....	gen/us
gigaelectron volts.....	GeV, BeV
gigahertz.....	GHz
gigawatt.....	GW
gram.....	g
gram-atom.....	g-at.
gram-calorie.....	g-cal
gram-molecular volume.....	g·m ³
grams per cubic centimeter.....	g/cm ³
grams per liter.....	g/liter
gray (J/kg).....	Gy
henry (V·s/A).....	H
hertz (cycle/s).....	Hz
hexagonal close-packed.....	hcp
high voltage.....	hv
hour.....	h
hyperfine structure.....	hfs
inductance-capacitance.....	LC
inductance, mutual.....	M
inductance, self.....	L
infrared.....	ir
inside diameter.....	i.d.
International Critical Tables.....	ICT
International System of Units.....	SI
joule (N·m).....	J
joule per Kelvin.....	J/K
joule per kilogram Kelvin.....	J/(kg·K)
Kelvin (never use ° with K).....	K
kilobar.....	kbar
kilocalorie.....	kcal
kilocalories per mole.....	kcal/mol
kilocurie.....	kCi
kilocycles per second.....	kHz
kiloelectron volt.....	keV
kilogauss.....	kG
kilogram.....	kg
kilogram-force.....	kgf
kilogram-meter.....	kg·m
kilogram per cubic meter.....	kg/m ³
kilohertz.....	kHz
kilohm.....	kΩ
kilojoule.....	kJ
kilometer.....	km
kilometers per second.....	km/s
kilo-oersted.....	kOe
kilovolt.....	kV
kilovolt-ampere.....	kVA
kilowatt.....	kW

kilowatt-hour.....	kWh
kilowatt of electrical energy.....	kWe
kilowatt of thermal energy.....	kWt
kinetic energy.....	KE
knot, knots.....	spell out
laboratory (system).....	lab
lambert.....	L
latitude.....	lat
lethal dose (superscript denotes percent).....	L ₅₀
limit.....	lim
liter, liters.....	L, or spell out
liter per second.....	L/s
local thermodynamic equilibrium.....	LTE
logarithm.....	log
logarithm, natural.....	ln
lumen (cd·sr).....	lm
lumens per watt.....	lm/W
lux (lm/m ²).....	lx
magnetomotive force.....	mmf
maximum.....	max
maximum permissible concentration.....	MPC
maxwell.....	Mx
mean free path.....	mfp
measured.....	meas
megabar.....	Mbar
megacurie.....	MCi
megahertz.....	MHz
megavolt.....	MV
megavolt-ampere.....	MVA
megawatt.....	MW
megawatt-hour.....	MWh
megohm.....	MΩ
melting point.....	mp
meter.....	m
meter-kilogram-second (unit system).....	mks
meter per second.....	m/s
meter per second squared.....	m/s ²
micro.....	spell out
microampere.....	μA
microcoulomb.....	μC
microcurie.....	μCi
microequivalent.....	μeq
microfarad.....	μF
microgram.....	μg
microhenry.....	μH
microliter.....	μL
micrometer.....	μm
microohm.....	μmho
micromole.....	μmol
microsecond.....	μs
microvolt.....	μV
microwatt.....	μW
mil (for electrical wire).....	spell out

milliamperes.....mA
 millibar.....mbar
 millibarn.....mb
 millicurie.....mCi
 milliequivalent.....meq
 millifarad.....mF
 milligram.....mg
 millihenry.....mH
 millilambert.....mL
 milliliter.....mL
 millimass units.....mamu
 millimeter.....mm
 millimeter of mercury.....mm Hg
 millisho.....mshc
 millimole.....mmol
 million electron volts.....MeV
 million gallons (geological use only).....Mgal
 million volts.....MV
 million years (geological use only).....Myr
 milliradian.....mrad
 millirem.....mrem
 millisecond.....ms
 millivolt.....mV
 milliwatt.....mW
 minium.....min
 minute.....min
 mole.....mol, or spell out
 mole percent.....spell out
 molecular weight.....mol wt
 month.....spell out
 motor generator.....e.g.
 nanometer.....nm
 nanosecond.....ns
 nautical mile.....spell out
 neutron.....n
 neutrons per square centimeter.....n/cm²
 Nevada Test Site.....NTS
 newton (kg·m/s²).....N
 normal (concentration).....N
 north.....N
 northern conjugate.....NC
 nuclear magnetic resonance.....NMR
 nuclear magneton.....μN
 nucleon.....N
 number(s).....No. (Nos.)
 observed.....obs
 oersted.....Oe
 ohm (V/A).....Ω
 optical density.....OD
 outside diameter.....o.d.
 oxygen-free, high-conductivity.....OFHC
 page(s).....p. (pp.)
 parts per million.....ppm

pascal (N/m²)..... Pa
 pascal-second..... Pa·s
 percent..... (See Section 3.10.1)
 phot (=10⁶ lux)..... Ph
 photomultiplier tube..... PM
 picofarad..... pF (no % μF)
 picogram..... pg
 poise..... P
 potential difference..... PD
 potential energy..... PE
 pressure, volume, temperature..... PV
 probable error..... pe
 proton..... p
 Public Document Room..... PDR
 pulses per second..... pps
 quality factor..... QF
 radian..... rad
 radian per second..... rad/s
 radian per second squared..... rad/s²
 radiochemical..... RC
 radiofrequency (adj.)..... rf
 real part (of x)..... Re(x)
 reciprocal meter..... (wave)/m
 reciprocal ohm..... mho
 reference(s)..... Ref. (Refs.)
 relative biological effectiveness..... RBE
 (of radiation)
 relative humidity..... RH
 relative ionospheric opacity meter..... riometer
 relative percent..... spell out
 relative standard deviation..... RSD
 revolutions per second..... rps
 Roentgen..... R
 Roentgen equivalent man..... rem
 root mean square..... rms
 second..... s
 section(s)..... Sec. (Secs.)
 siemens (A/V)..... S
 sign..... sign
 silicon-controlled rectifier..... SCR
 soluble..... sol
 solution..... soln
 south..... S
 specific activity..... sp act.
 specific gravity..... sp gr
 specific heat..... sp ht
 specific volume..... sp vol
 speed of light..... c
 square..... sq
 square centimeter..... cm²
 square kilometer..... km²
 square meter..... m²
 square meter per second..... m²/s

square millimeter.....mm²
 standard.....std
 standard deviation.....std dev
 standard temperature and pressure.....STP
 steradian.....sr
 stokes.....St
 tap (1 dyn-s/cm²).....spell out
 temperature.....temp
 tesla (Wb/m²).....T
 theoretical.....theoret
 thermocouple.....TC
 thermoluminescent detector.....TLD
 thin-layer chromatography.....TLC
 trace.....Tr
 transverse acoustic.....TA
 transverse optic.....TO
 triton.....t
 tuballoy.....spell out
 ultraviolet.....uv
 velocity.....v
 versus.....vs
 Vickers diamond hardness.....Vdh
 volt (W/A).....V
 volt-ampere.....VA
 volt per meter.....V/m
 volts, alternating current.....Vac
 volts, direct current.....Vdc
 volume.....vol
 volume percent.....spell out
 volume per volume.....v/v
 watt (J/s).....W
 watt per meter kelvin.....W/(m-K)
 watt per steradian.....W/sr
 weber.....wb
 week.....wk
 weight.....wt
 weight percent.....spell out
 weight-to-volume ratio.....W/V
 weight-to-weight ratio.....W/W
 west.....W
 year.....yr

3. ELEMENT ABBREVIATIONS

Name	Symbol	Name	Symbol
actinium	Ac	bismuth	Bi
aluminum	Al	boron	B
americium	Am	bromine	Br
antimony	Sb	cadmium	Cd
arsenic	As	calcium	Ca
astatine	At	californium	Cf
barium	Ba	carbon	C
berkelium	Bk	cerium	Ce
beryllium	Be	cesium	Cs

<u>Name</u>	<u>Symbol</u>	<u>Name</u>	<u>Symbol</u>
chlorine	Cl	oxygen	O
chromium	Cr	palladium	Pd
cobalt	Co	phosphorus	P
copper	Cu	platinum	Pt
curium	Cm	plutonium	Pu
dysprosium	Dy	polonium	Po
einsteinium	Es	potassium	K
erbium	Er	praseodymium	Pr
europium	Eu	promethium	Pm
fermium	Fm	protactinium	Pa
fluorine	F	radium	Ra
francium	Fr	radon	Rn
gadolinium	Gd	rhenium	Re
gallium	Ga	rhodium	Rh
germanium	Ge	rubidium	Rb
gold	Au	ruthenium	Ru
hafnium	Hf	samarium	Sm
helium	He	scandium	Sc
holmium	Hm	selenium	Se
hydrogen	H	silicon	Si
indium	In	silver	Ag
iodine	I	sodium	Na
iridium	Ir	strontium	Sr
iron	Fe	sulfur	S
krypton	Kr	tantalum	Ta
lanthanum	La	technetium	Tc
lawrencium	Lr	tellurium	Te
lead	Pb	terbium	Tb
lithium	Li	thallium	Tl
lutetium	Lu	thorium	Th
magnesium	Mg	thulium	Tm
manganese	Mn	tin	Sn
mendelevium	Md	titanium	Ti
mercury	Hg	tungsten	W
molybdenum	Mo	uranium	U
neodymium	Nd	vanadium	V
neon	Ne	xenon	Xe
neptunium	Np	ytterbium	Yb
nickel	Ni	yttrium	Y
niobium	Nb	zinc	Zn
nitrogen	N	zirconium	Zr
nobelium	No		
osmium	Os		

4. THE GREEK ALPHABET

<u>Greek Letter</u>	<u>Lower Case</u>	<u>Upper Case</u>	<u>Greek Letter</u>	<u>Lower Case</u>	<u>Upper Case</u>
alpha	α	Α	nu	ν	Ν
beta	β	Β	xi	ξ	Ξ
gamma	γ	Γ	omicron	ο	Ο
delta	δ	Δ	pi	π	Π
epsilon	ε	Ε	rho	ρ	Ρ
zeta	ζ	Ζ	sigma	σ	Σ
eta	η	Η	tau	τ	Τ
theta	θ	Θ	upsilon	υ	Υ
iota	ι	Ι	phi	φ	Φ
kappa	κ	Κ	chi	χ	Χ
lambda	λ	Λ	psi	ψ	Ψ
mu	μ	Μ	omega	ω	Ω

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APPENDIX C
MATHEMATICS IN A REPORT

1. INTRODUCTION

This appendix is an expansion of Section 7 of the style guide. It provides guidance for the use of numbers and metric units in a report.

2. WRITING NUMBERS

2.1 When to Use Numerals

2.1.1 Units of Measure

Express units of measure or time in numerals. Never begin a sentence with a numeral, however.

1. Measure

7 m	3.5 L, 3.5 liters, or 3.5 L*
1.5 kg	10 A
3 MeV	50 m/s
36 K	13.5° (angle)
17.5 s	50 000 units (but 5000 or 5 000 units; see also Section 3.4.4.4 in this appendix)

2. Mathematical expressions

multiplied by 3
divided by 14
a factor of 5
integrated from 0 to 1
f-values of 1, 2, and 3

3. Decimals

Put a zero before the decimal point in numbers less than one, but omit zeros and the decimal point unless there are significant digits to follow the decimal point.

0.25 mm, 1.25 mm
specific gravity, 0.9547
gauge height, 10 m, but 10.25 m

*The National Bureau of Standards has adopted the capital L as the abbreviation for liter; NRC finds this usage acceptable.

4. Percentages

Use a percent symbol only when it is preceded by a numeral.

5. Proportions

1 to 4
1:62 500
1/3/5 of powder/alcohol/water

6. Times

6 h
3955 s
20 min
10 yr
90 days

but: four centuries
three decades
statistics of any one year
in a year or two

7. Clock times and dates

0600
1400
4:30 p.m.
10 o'clock or 10 p.m. (not 10 o'clock p.m.)
12 m. (noon), 12 p.m. (midnight)
July 4, 1976, not July 4th 1976
the 1st (day) of the month.

but: the 1st of April or the first of May
(not referring to specific days)
January 31, 1976, but January 1976 (no comma)
31 January 1976 (also acceptable)

2.1.2 Sentence Containing Only One Number

If a sentence contains only one number, one that is not discussed in Section 2.1.1, use a numeral if it is 10 or more; spell it out if it is less than 10. (EXCEPTION: Always spell out a number when it is the first word of a sentence; see also Sections 2.1.3 and 2.1.4 in this appendix.)

...saw seven men...
...drove 24 horses...

but: Seventeen students took the test.
Twelve 2-kg packages were stacked on each pallet.

2.1.3 Sentences With Two or More Numbers

If a sentence contains two or more numbers (not units of measurement) of which at least one number is 10 or greater, use numerals for all of them. Otherwise, spell them all out. (Note that the sentence is the unit within which to reconcile the conflicting rules for numbers as large as and smaller than 10.) For example:

Each of 15 major commodities, 9 metal and 6 nonmetal, was available.

Each of nine major commodities, five metal and four nonmetal, was available.

Petroleum came from 16 fields, of which 3 were discovered in 1956.

Petroleum came from nine fields, of which eight were discovered in 1956.

Numerals that express units of measurement or time do not affect the handling of other numbers within a sentence. (See preceding Section 2.1.1.) For example:

Each of the five trucks traveled an average of 75 miles.

Each of the 15 trucks traveled an average of 75 miles.

2.1.4 Ordinal Numbers

Spell out ordinal numbers (first, second, third) if they are single words; write them as numerals if they are not.

He represented the second and ninth wards.

He served in the 95th congress.

Be consistent in expressing ordinal and cardinal numbers that appear together in a sentence. For example:

The fourth group contained three items.

The fourth group contained 12 items.

The eighth and ninth groups contained 9 and 12 items, respectively.

2.2 When to Spell Out Numbers

Spell out any number that appears at the beginning of a sentence or heading. If this causes conflict with other rules given here, rephrase the sentence or heading to avoid beginning with a number.

Five years ago
Five-year plans are lagging.
Four hundred and fifty men are employed.
(Consider changing to: Employees number 450.)
Sixty-six horses, twenty-nine men, and nine guns
were captured. (Consider changing to: Losses
were 66 horses, 29 men, and 9 guns.)

Do not repeat a spelled-out number as a numeral in parentheses.

Spell out numbers less than 100 that precede a compound modifier containing a numeral.

twelve 2-kg packages
ninety-three 5-s-wide crates
five 2400-L/s pumps

Spell out rounded and approximate numbers.

a hundred people
less than a million
about a million dollars (but \$2 million)

2.3 Hyphenation of Numbers

Hyphenate between numbers and words that combine to form a unit modifier preceding the word that is modified. (See also Section 7.1 of Appendix E.)

1-mm diam
10-mm-diam rod (but a rod 10 mm in diameter)
6-m-long board (but a board 6 m long)
five-member panel
10-fold increase (but threefold, ninefold)

When two or more hyphenated compounds in series have a common base element that is omitted in all but the first or last one, retain the hyphen to indicate suspension.

2- to 5-mm-thick sheets
2- or 3-mm tubing, not 2 or 3-mm tubing
2- by 4-mm sheets, but sheets 2 by 4 mm in cross section
8-, 10- and 16-s beams

Hyphenate between the elements of spelled-out compound numbers from 21 to 99.

twenty-one
thirty-seven
eighty-two
ninety-nine

Hyphenate between the numerator and denominator of a spelled-out fraction, except when one or the other already contains a hyphen.

one-half
 two-thirds - -
 one-hundredth
 two one-thousandths or two-thousandths

In listings, hyphenate, and use in the singular, unit modifiers following and reading back to the item modified.

motor: ac, three-phase, 60-cycle, 115-V,
 not motor: ac, three phases, 60 cycles, 115 V
 glass jars: 5-L, 2-L, 250-ml
 belts: 2-w, 30-mm, 40-mm

Do not hyphenate a modifier consisting of a number followed by a possessive noun such as 2 months' layoff, 1 day's pay, or seven men's labor.

3. METRIC UNITS

3.1 International System (SI) of Units

The NRC will eventually convert to predominant, but not necessarily exclusive, use of the modernized metric system--the International System of Units (SI). Some NRC components (Office of Standards Development and Division of Site Safety and Environmental Analysis, NRR) have already established policies for the use of SI units by members of their staffs. In the absence of an established policy, the use of dual units (with the SI unit first followed by the conventional unit in parentheses) or SI units alone is encouraged. SI radiological units, however, should not be used alone until they have been adopted in NRC regulations.

The standard authority on SI units is National Bureau of Standards Special Publication 330, "The International System of Units (SI)." The American Society for Testing and Materials publication ASTM E 380-76, "ASTM/IEEE Standard Metric Practice," is recommended as a source of rules on style and use of SI units, conversion and rounding, handling of tolerances, etc. (Both of these publications are listed in the bibliography at the end of this appendix.)

Standard SI prefixes are given in the following list. The prefixes hecto-, deka-, deci-, and centi- are not recommended except for expressing area and volume.

<u>Exponent</u>	<u>Prefix</u>	<u>SI Symbol</u>	<u>Exponent</u>	<u>Prefix</u>	<u>SI Symbol</u>
10 ¹⁸	exa	E	10 ⁻¹	deci	d
10 ¹⁶	peta	P	10 ⁻²	centi	c
10 ¹²	tera	T	10 ⁻³	milli	m
10 ⁹	giga	G	10 ⁻⁶	micro	μ
10 ⁶	mega	M	10 ⁻⁹	nano	n
10 ³	kilo	k	10 ⁻¹²	pico	p
10 ²	hecto	h	10 ⁻¹⁵	femto	f
10	deka	da	10 ⁻¹⁸	atto	a

3.2 Base and Supplementary Units

<u>Quantity</u>	<u>Unit</u>	<u>SI Symbol</u>
Base Units		
Length	meter	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Amount of substance	mole	mol
Luminous intensity	candela	cd
Supplementary Units		
Plane angle	radian	rad
Solid angle	steradian	sr

3.3 Derived Units

<u>Quantity</u>	<u>Unit</u>	<u>SI Symbol</u>	<u>Formula</u>
absorbed dose	gray	Gy	J/kg
acceleration	meter per second squared		m/s^2
activity (radioactive)	becquerel	Bq	s^{-1}
activity (radioactive)	disintegration per second		dis/s
angular acceleration	radian per second squared		rad/s^2
angular velocity	radian per second		rad/s
area	square meter		m^2
density	kilogram per cubic meter		kg/m^3
dose equivalent	sievert	Sv	J/kg
electric capacitance	farad	F	$A \cdot s/V$
electrical conductance	siemens	S	A/V
electric field strength	volt per meter		V/m
electric inductance	henry	H	$V \cdot s/A$
electric potential difference	volt	V	W/A
electric resistance	ohm	Ω	V/A
electromotive force	volt	V	W/A
energy	joule	J	$N \cdot m$
entropy	joule per kelvin		J/K
force	newton	N	$kg \cdot m/s^2$
frequency	hertz	Hz	s^{-1}
illuminance	lux	lx	lm/m^2
luminance	candela per square meter		cd/m^2
luminous flux	lumen	lm	$cd \cdot sr$

<u>Quantity</u>	<u>Unit</u>	<u>SI Symbol</u>	<u>Formula</u>
magnetic field strength	ampere per meter		A/m
magnetic flux	weber	Wb	V·s
magnetic flux density	tesla	T	Wb/m ²
magnetomotive force	ampere	A	
power	watt	W	J/s
pressure	pascal	Pa	N/m ²
quantity of electricity	coulomb	C	A·s
quantity of heat	joule	J	N·m
radiant intensity	watt per steradian		W/sr
specific heat	joule per kilogram-kelvin		J/kg·K
stress	pascal	Pa	N/m ²
thermal conductivity	watt per meter-kelvin		W/m·K
velocity	meter per second		m/s
viscosity, dynamic	pascal-second		Pa·s
viscosity, kinematic	square meter per second		m ² /s
voltage	volt	V	W/A
volume	cubic meter		m ³
wave number	reciprocal meter		(wave)/m
work	joule	J	N·m

3.4 Style and Usage

3.4.1 General

Avoid use of mixed units, especially those compounded from different systems. For example, use kilogram per cubic meter (kg/m³), not kilogram per gallon (kg/gal), and use 0.1709 rad or 10.25 deg. not 10 deg 15 min.

3.4.2 Application of Prefix

3.4.2.1 General

Use metric prefixes to indicate orders of magnitude, thus eliminating insignificant digits and decimals and providing a convenient substitute for writing powers of 10 as generally preferred in computation. For example, 12 300 m or 12.3x10³ m becomes 12.3 km and 0.0123 μA or 12.3x10⁻⁶ A becomes 12.3 nA.

3.4.2.2 Selection

Use multiple and submultiple prefixes representing steps of 1000. For example, show force in mN, N, and kN and length in mm, m, km, etc. When expressing a quantity by a numerical value and a unit, try to choose prefixes such that the numerical value lies between 0.1 and 1000, except where certain multiples or submultiples have been agreed to for particular use. The same unit, multiple, or submultiple is used for tabular values even though the series exceeds the preferred range 0.1 to 1000.

3.4.2.3 Double Prefixes

Do not use double prefixes. For example, use GW (gigawatt), not kmW, use pF (picofarad), not μ F, and use Gg (gigagram), not Mkg.

3.4.2.4 Compound Units

Use only one prefix in forming a compound unit. Normally the prefix should be attached to a unit in the numerator. An exception occurs when one of the units is the kilogram.

3.4.2.5 Higher Order Metric Units

With metric units of higher order such as m^2 and m^3 , raise the prefix to the same order (that is, km^2 is $10^6 m^2$ not $10^3 m^2$).

3.4.3 Use of SI Units

3.4.3.1 Length

Nominal dimensions merely name the item, and no SI equivalent of the name is required.

Nominal Size (in.)	Outside Diameter [in. (mm)]	Wall Thickness [in. (mm)]		
		Sch 40	Sch 80	Sch 160
1	2.315 (58.40)	0.133 (3.38)	0.179 (4.55)	0.250 (6.35)

Likewise, the name "2 by 4" refers only to the approximate dimensions in inches of a rough-sawed, green piece of timber, the finished dimensions of which are considerably smaller. A 1/4-20 UNC screw thread should continue to be so identified. However, the controlling dimensions of the part, such as the pitch and major and minor diameters of a screw thread, should be converted to SI values. Convert threads per inch to millimeter pitch.

When a dimension such as wire diameter or sheet thickness is expressed by a gauge number, give the appropriate gauge system (for example, American Wire Gauge or AWG) and the corresponding SI value.

Convert surface finish expressed in microinches to micrometers (μ m).

3.4.3.2 Temperature

The SI temperature scale is the International Thermodynamic Temperature Scale, and the unit used for expressing temperature and temperature intervals is the Kelvin. However, the degree Celsius has wide use, particularly in engineering and in non-scientific areas, and it is permissible to use the Celsius scale where considered necessary. The Celsius scale (formerly called the centigrade scale) is related directly to the Kelvin scale as follows:

One degree Celsius equals one degree Kelvin, exactly.
A Celsius temperature ($^{\circ}\text{C}$) is related to a Kelvin
temperature (K) as $K = 273.15 + ^{\circ}\text{C}$, exactly.

3.4.3.3 Time

The SI unit for time is the second. This unit is preferred and should be used when practicable. In other cases, use minute, hour, day, etc.

3.4.3.4 Angles

The SI unit for plane angle is the radian. Use the arc degree and its decimal submultiples when the radian is not a convenient unit. Express solid angles in steradians.

3.4.3.5 Stress and Pressure

The SI unit for pressure and stress is the pascal (newton per square meter).

3.4.4 Style

3.4.4.1 Capitalization

Do not capitalize symbols for SI units unless the unit is derived from a proper name; thus, Hz for H. R. Hertz, but m for meter. Do not capitalize unabbreviated units such as hertz, newton, and kelvin. Do not capitalize numerical prefixes and their symbols, except for the symbols M, G, T, P, and E.

3.4.4.2 Plurals

Unabbreviated SI units form their plurals in the usual manner. Always write SI symbols in singular form; for example,

50 newtons is 50 N, and
25 grams is 25 g.

3.4.4.3 Punctuation

Do not use periods after SI unit symbols except at the ends of sentences.

3.4.4.4 Number Grouping

To facilitate reading numbers of four or more digits, place the digits in groups of three separated by spaces instead of commas, counting both to the left and to the right of the decimal point. When there are four digits, the spacing is optional. This style also avoids confusion caused by the European use of commas to express decimal points. For example, the following samples show the preferred usage:

1 532 or 1532 instead of 1,532
132 541 816 instead of 132,541,816
933 769.816 78 instead of 983,769.81678

3.4.4.5 Derived Units

In derived unit symbols, use the center dot or a space to indicate multiplication and a slash to indicate division. Symbols to the left of the slash are in the numerator and those to the right are in the denominator. Only one slash should be used unless parentheses are included to avoid ambiguity. If typing a center dot creates problems, a hyphen may be used instead.

4. EQUATIONS

4.1 Units of Measure Within Equations

When U.S. customary units appear in equations, omit the SI equivalents. Instead of inserting the SI equivalents in parentheses as in text or small tables, restate the equations using SI quantities or add a sentence, paragraph, or footnote stating the factor to be used to convert the calculated result in U.S. units equivalent to the preferred SI units.

4.2 Displayed Equations

Type mathematical equations, rather than write by hand, for simplicity and clarity in the reproduction process. Equations may be typed centered on the page, tabbed in from the left margin, or flush left with the rest of the text. If mathematical symbols and Greek letters are not available with the typing equipment, use commercially produced press-on letters and symbols. If press-on material is unavailable, handprint letters and symbols preferably with ink. Allow sufficient space within a basic typewritten equation to accommodate any press-on or handwritten symbols or letters.

Align a series of equations (not separated by text) by equality signs and place them to give the appearance of being centered as a whole (Ref. 4) or tab in and align by equality signs. Consider the following sample:

$$C_{d1} = \frac{\lambda_1}{b} [\exp(bu) - 1] \exp(-au) \quad (1)$$

where

$$a = \lambda_1/\lambda_2$$

$$b = a - K_2/K_1$$

$$u = \lambda_2 K_1 x/V$$

λ_i = decay constant for parent ($i=1$) or daughter ($i=2$) (yr^{-1})

K_i = sorption coefficient

x = aquifer path length (1,000 m)

V = aquifer velocity (100 m/yr)

-- Note that the equation number (enclosed by parentheses) is displayed on the same line as the main line of the equation and is placed flush with the right margin. Also note that punctuation is not necessary with displayed equations.

There are occasions when short equations or formulas can be run in the text to save space. However, take care to prevent superscript or subscript letters or numbers from running into preceding or following text. A half-line of space can also be used preceding and following a text line including an equation to prevent any overrunning of text or equation components.

When a line of equations is wider than a full line of text, break it at the equality sign or an operation sign. In chemical formulas, break the lengthy line at the arrow.

5. BIBLIOGRAPHY

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APPENDIX D

GUIDELINES FOR CREATING TABLES AND GRAPHICS

1. INTRODUCTION

This appendix presents a brief description of how tables and figures should be prepared for reports. Examples of report tables and figures are also included.

2. TABLES

A table is useful for showing large numbers of specific, related statistics in a brief space. A table can present data in a more concise form than is possible in the text and a table is more accurate than graphic presentations because it provides numerous facts that a graph cannot convey. A table makes comparisons between figures easy because of the arrangement of the figures into rows and columns, although overall trends about the information are more easily seen in charts and graphs. (See Table D.1 for a sample format.)

2.1 Guidelines for Creating Tables

2.1.1 Table Number

If you are using several tables, assign each a specific number; position the number and title above the table. The numbers are usually Arabic, and they should be assigned sequentially to the tables throughout the text. Refer to tables in the text by table number rather than by direction ("Table 4" rather than "the above table"). If there are more than five tables in your report or paper, list them, their captions, and their table and page numbers on a separate page immediately after the Table of Contents, labeled "List of Tables."

2.1.2 Caption

The caption, centered above the table, should describe concisely what the table represents.

2.1.3 Boxhead

The boxhead carries the column headings. These should be kept concise but descriptive. Units of measurement, where necessary, should be specified either as part of the heading or enclosed in parentheses beneath the heading. Avoid vertical lettering where possible.

2.1.4 Stub

The left-hand vertical column of a table is the stub. It lists the items about which information is given in the body of the table, and carries a boxheading only if identification is necessary.

2.1.5 Body

The body comprises the data below the boxhead and to the right of the stub. Within the body, arrange columns so that the terms to be compared appear in

Sample Table and Its Parts

Caption
Table Number

Table D.1 Recreational fresh-water angling by water body type and geographical region (in thousands of anglers)*

Boxhead	Geographical Regions	Reservoirs	Man-Made Ponds	Natural Lakes & Ponds	Rivers & Streams	Farm Ponds	Column Captions
	New England	130	40	570	410	410	Body
	Middle Atlantic	710	250	780	1200	630	
	East North Central	1200	760	3100	1600	1300	
Stub	West North Central	810	550	1200	970	980	
	South Atlantic	1100	60	640	1500	1600	
	East South Central	890	630	190	670	1200	
	West South Central	1700	610	430	880	1300	
	Mountain	820	50	280	600	230	
	Pacific	950	200	820	1400	470	
Rule	Totals 8300 3900 8000 9200 7800						

Footnote → *Anglers who fished in more than one water body or region are represented in more than one category.

Source Line → Source: U.S. Department of the Interior

adjacent rows and columns. Where no information exists for a specific item, leave a blank space.

2.1.6 Rules (Lines)

These are the lines that separate the table into its various parts. Horizontal lines are placed below the title, below the body of the table, and between the column headings and the body of the table. They should not be closed at the sides. The columns within the table may be separated by vertical lines if they aid clarity.

2.1.7 Footnotes

Footnotes are used for explanations of individual items in the table. Symbols (N,F) or lower-case letters rather than numbers are ordinarily used to identify table footnotes because numbers might be mistaken for data in a numerical table.

2.1.8 Source Line

The source line, which identifies where the data were obtained, appears below any footnotes, when appropriate.

2.1.9 Continuing Table

When a table must be divided so that it can be continued on another page, repeat the boxhead and give the table number at the head of each new page with a "continued" label (Table 3, continued).

3. GRAPHS

Graphs, like tables, present numerical data in visual form. Graphs have several advantages over presenting data in tables or within the text, however. Trends, movements, distributions, and cycles are more readily apparent in graphs than they are in tables. By providing a means for ready comparisons, a graph often shows a significance in the data not otherwise immediately apparent. Be aware, however, that although graphs present statistics in a more comprehensible form than tables do, they are less accurate. For this reason, they are often accompanied by tables giving exact figures. The kinds of graphs most commonly used in NRC reports are line graphs, bar graphs, and pie graphs.

3.1 Line Graphs

The line graph, most widely used of all graphs, shows the relationship between two sets of numbers by means of points plotted in relation to a vertical and horizontal axis drawn at right angles. Once plotted, the points are connected to one another to form a continuous line, thus making the relationship between the two sets of figures easy to see.

3.1.1 Tips on Preparing Line Graphs

- (1) Give the graph a title that describes the data clearly and concisely.
- (2) Assign a figure number if your report includes more than five illustrations.

- (3) Include a key that lists and explains symbols when necessary. At times a label will do just as well, as in Figure D.1.
- (4) Indicate the zero point of the graph (the point where the two axes meet). If the range of data shown makes it inconvenient to begin at zero, insert a break in the scale as in Figure D.2.
- (5) Divide the vertical axis in equal portions from the least amount at the bottom to the greatest amount at the top, unless it is a log scale. Place the caption for this scale either at the upper left or vertically along the axis.
- (6) Divide the horizontal axis in equal units from left to right. If a caption is necessary, center it directly beneath the scale.
- (7) Divide the vertical and horizontal scales so that they give an accurate visual impression of the data, since the angle at which the curved line rises and falls is determined by the scales of the two axes. A curve can be kept free of distortion if the scales maintain a constant ratio with each other.

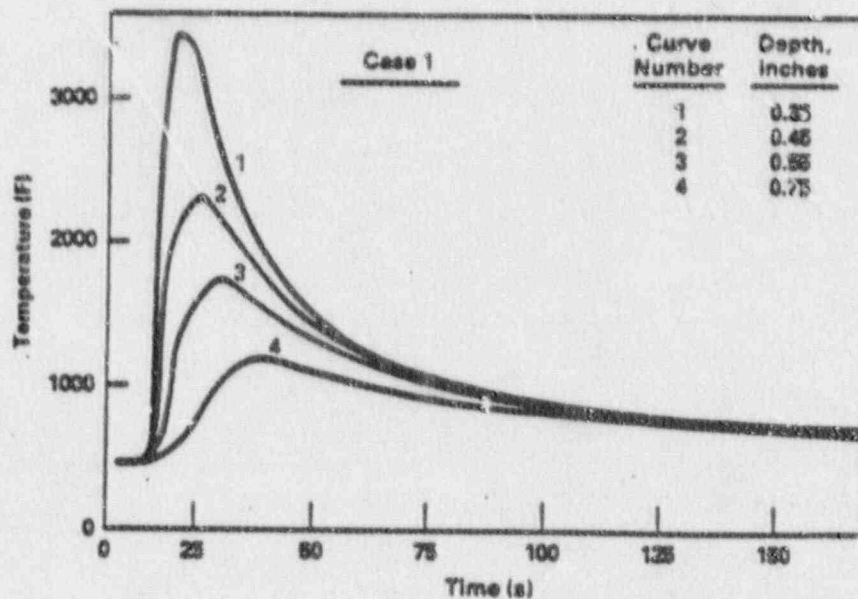


Figure D.1 Temperature histories of various depths below the weld torch for case 1.

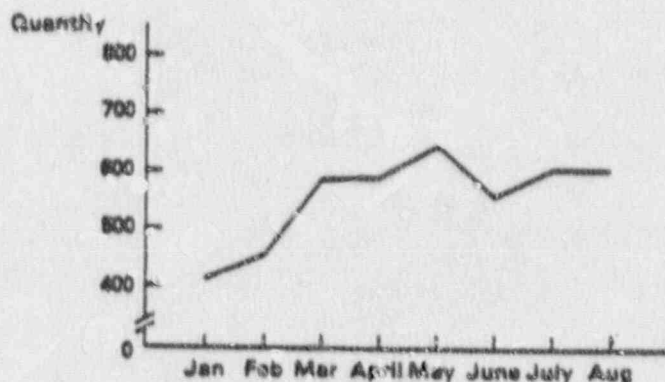


Figure D.2 Widget production for January-August 1979.

- (8) Keep grid lines to a minimum so that curved lines stand out. Since precise values are usually shown in a table of data accompanying a graph, detailed grid lines are unnecessary.
- (9) If the information comes from another source, include a source line below the graph.
- (10) Place explanatory footnotes directly below the figure number.

3.2 Bar Graphs

Bar graphs consist of horizontal or vertical bars of equal width but scaled in length to represent some quantity. They are commonly used to show (1) quantities of the same item at different times, (2) quantities of different items for the same time period, or (3) quantities of the different parts of an item that make up the whole.

If the bar is not labeled, the different portions must be marked clearly by shading or crosshatching. Include a key that identifies the various subdivisions, as in Figure D.3.

Bar graphs can also show the different portions of an item that make up the whole. The bar is then equivalent to 100 percent. It is then divided according to the appropriate proportions of the item sampled, as Figure D.4. This type of graph can be constructed vertically or horizontally and can indicate more than one whole where comparisons are necessary, as Figure D.5.

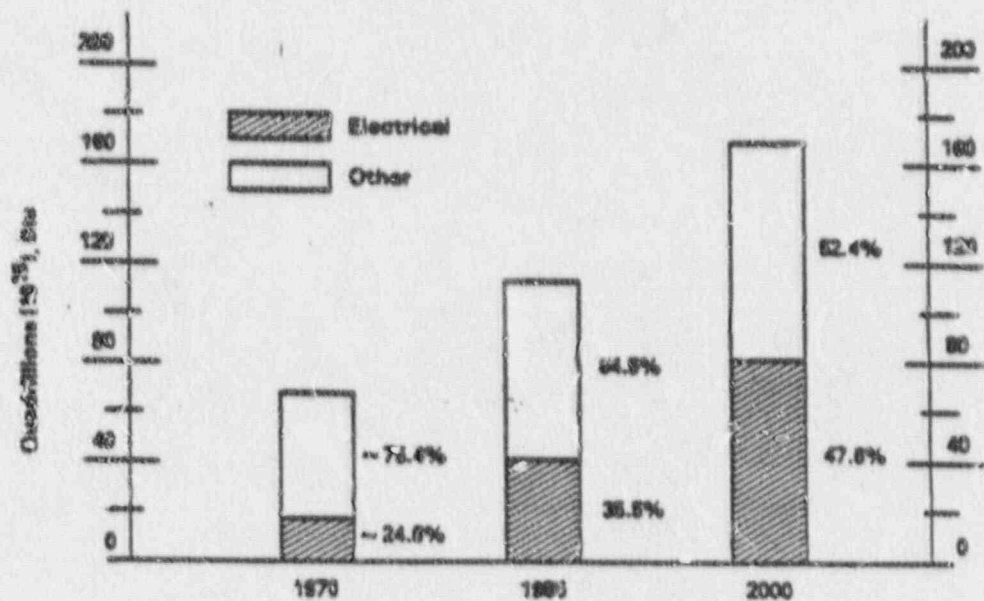


Figure D.3 Total U.S. energy requirements for 1970, 1985 and 2000.

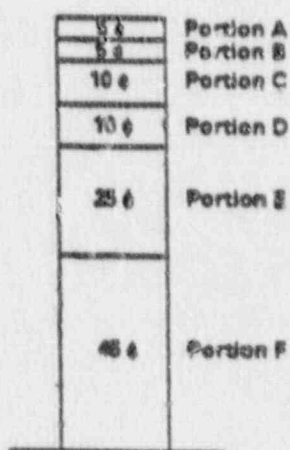


Figure D.4 Your energy dollar.

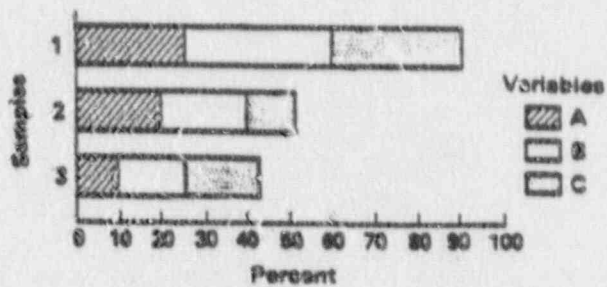


Figure D.5 Example of 100-percent bar graph showing proportions of three variables in three samples.

3.3 Pie Graphs

A pie graph presents data as wedge-shaped sections of a circle. The circle equals 100 percent, or the whole, of some quantity (a tax dollar, personnel, the hours of a working day), with the wedges representing the various ways in which the whole is divided. In Figure D.6, for example, the circle represents NRC funds for FY 1979. It is divided into units equivalent to the percentage of funds allocated to major program offices and advisory groups.

Pie graphs provide a quick, easy-to-read way of presenting information compared with tables; in fact, a table often accompanies a pie graph with a more detailed breakdown of the same information.

When you construct a pie graph, keep the following things in mind.

- (1) The complete 360° circle is equivalent to 100 percent; therefore, each percentage point is equivalent to 3.6°.
- (2) To make the relative percentages as clear as possible, begin at the 12 o'clock position and sequence the wedges clockwise, from largest to smallest.
- (3) If you shade the wedges, do so clockwise and from light to dark.
- (4) Keep all labels horizontal and, most important, give the percentage values of each wedge.
- (5) Finally, check to see that all wedges, as well as percentage values given for them, add up to 100 percent.

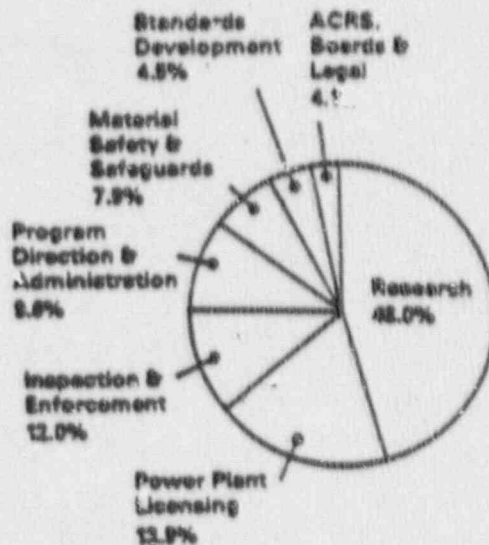


Figure D.6 NRC funds for FY 1979 - \$331 million.

Although pie graphs have strong visual impact, they also have drawbacks. If more than five or six types of information are presented, the graph looks cluttered. Also, since pie graphs usually present information in percentages, they must often be accompanied by a table listing the figures used to calculate the percentage amounts. Further, unless percentages are labeled on each section, the reader cannot compare the values of the sections as accurately as with a bar graph.

4. MAPS

Maps can be used to show the specific geographic features of the area represented (roads, mountains, rivers, etc.) or to show information according to geographic distribution (population, housing, manufacturing centers, etc.). (See Figure D.7.)

Bear these points in mind as you create maps for use with your text.

- (1) Label the map clearly.
- (2) Assign the map a figure number if you are using enough illustrations to justify use of figure numbers.

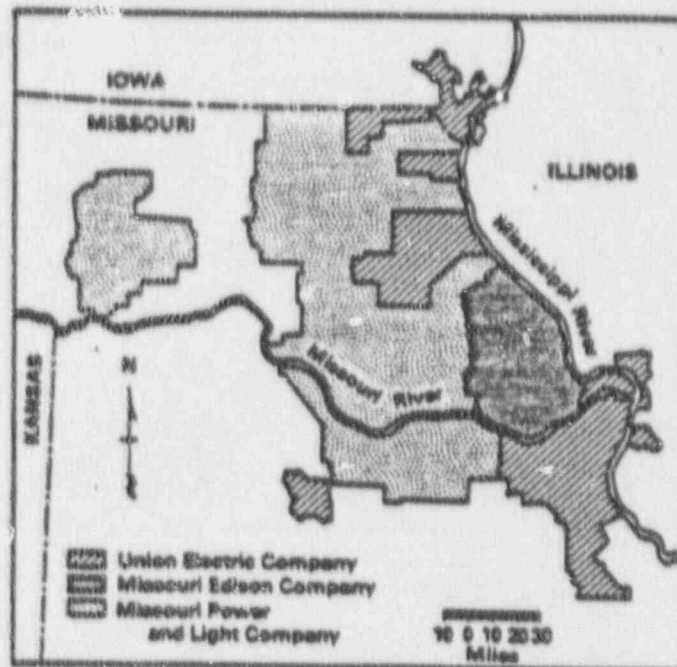


Figure D.7 Location of service area of three utilities.

- (3) Make sure all boundaries within the map are clearly identified. Eliminate unnecessary boundaries. - -
- (4) Eliminate unnecessary information from your map. For example, if population is important, do not include mountains, roads, rivers, etc..
- (5) Include a scale of miles or feet to give your reader an indication of the map's proportions.
- (6) Indicate which direction is north.
- (7) Show the features you want emphasized by shading, dots, crosshatching or use of appropriate symbols when color reproduction cannot be used.
- (8) If you use only one color, only three shades of a single color will show up satisfactorily.
- (9) Include a key telling what the different colors, shadings, or symbols represent.
- (10) Place maps as close as possible to the portion of the text that refers to them.

5. DRAWINGS

A drawing is useful when you wish to focus on details or relationships that a photograph cannot capture. A drawing can emphasize the significant piece of a mechanism, or its function, and omit what is not significant. However, if the precise details of the actual appearance of an object are necessary to your report or document, a photograph is essential. Tips for creating and using drawings follow:

- (1) Give the drawing a clear title and a figure number, both of which should be centered below the drawing.
- (2) Place the source line, if necessary, in the lower left corner.
- (3) Show the equipment from the point of view of the person who will use it.
- (4) When illustrating a subsystem, show its relationship to the larger system of which it is a part.
- (5) Draw the different parts of an object in proportion to one another, unless you indicate that certain parts are enlarged.
- (6) Where a sequence of drawings is used to illustrate a process, arrange them from left to right.
- (7) Label parts in the drawing so that text references to them are clear.
- (8) Depending on the complexity of what is shown, labels may be placed on the parts themselves, or the parts may be given letter or number symbols, with an accompanying key. (See Figure D.8.)

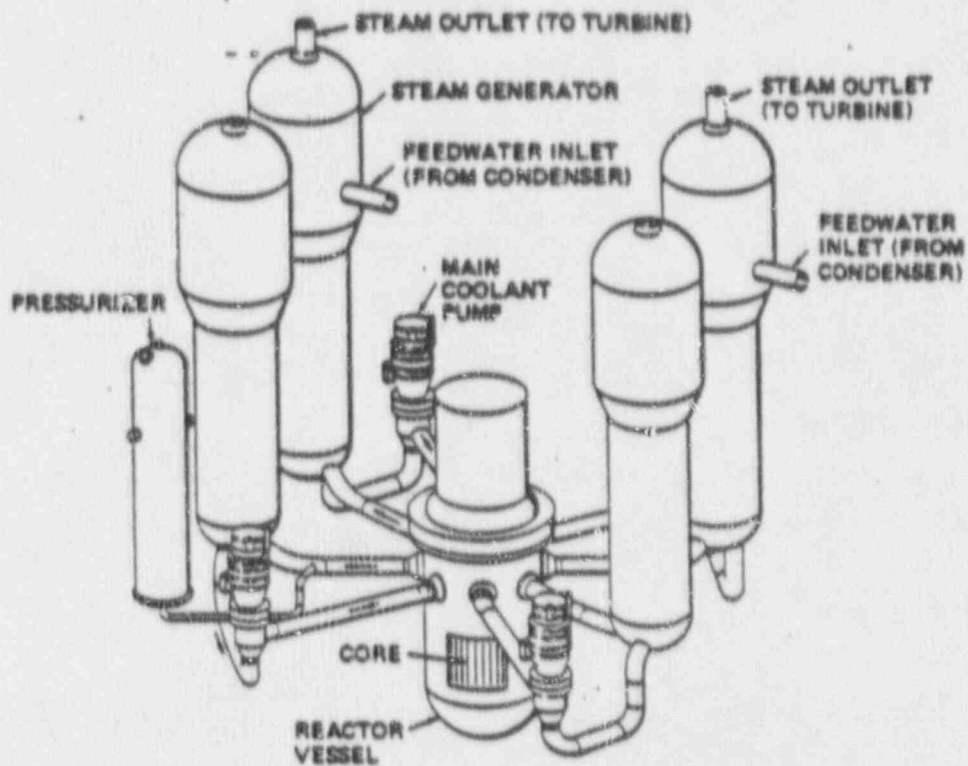


Figure D.8 Reactor coolant system for PWR.

6. FLOWCHARTS

A flowchart is a diagram of a process that involves stages, with the sequence of stages shown from beginning to end. Figure D.9 illustrates the cooling cycles of a PWR.

When creating flowcharts, observe the following guidelines:

- (1) Title the flowchart clearly.
- (2) Label each step in the process, or identify it with a conventional symbol. Steps can also be represented pictorially or in captioned blocks.
- (3) Use arrows to show the directions of flow.

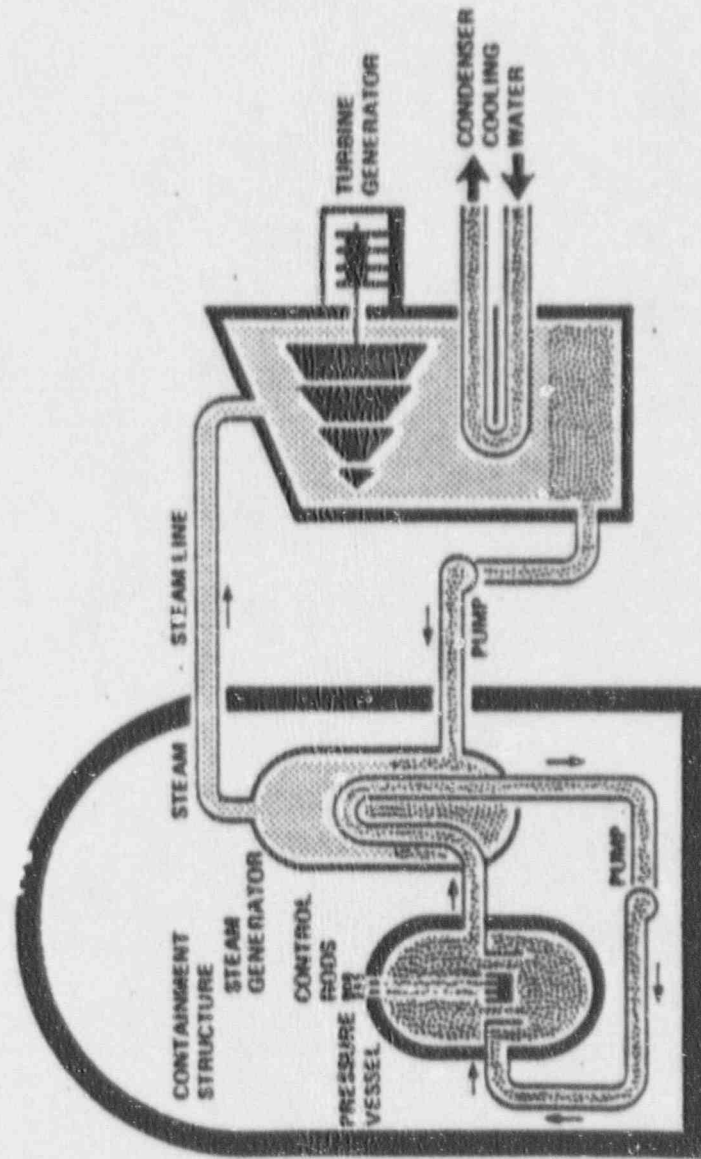


Figure D.9 Pressurized water reactor (PWR) cooling cycles.

- (4) Include a key if the flowchart contains symbols your reader may not understand.
- (5) Leave adequate white space on the page. Do not position your steps and directional arrows too close together.
- (6) As with all illustrations, place the flowchart as close as possible to that portion of the text that refers to it.
- (7) Assign a figure number if the report contains more than five illustrations.

7. PHOTOGRAPHS

Photographs are useful for showing objects or phenomena that are new or unusual, that are at a particular stage of development, that exhibit wear, damage, or the significance of a particular setting, etc. As you create or select photographs, consider the camera angle carefully so that the photograph shows only what is essential. When submitting photographs with the report manuscript, keep the following guidelines in mind:

- (1) Submit high-contrast glossy black and white photographs only. Do not submit color photographs.
- (2) Provide a figure number and caption. Photographs are considered figures and are therefore given figure numbers in sequence with the other illustrations in a report.
- (3) Mount photographs on white bond paper with rubber cement and provide ample margins.
- (4) If the photograph is the same size as the report page, type the caption, figure and page numbers and any labels for important points on pieces of paper and glue them to the photograph with rubber cement.
- (5) If the orientation of the photograph is not obvious at a glance, position the figure number and caption so that they can be read while the photograph is being viewed from the proper orientation.
- (6) Place a familiar object, such as a ruler or other scale, in the foreground to show relative size.
- (7) On photomicrographs, show a scale (____ mm) or give the true magnification in the caption. Photomicrographs whose magnification is given in the caption should not be reduced.
- (8) If the photograph must be cropped, mark the crop lines at the edges of the photograph. Do not draw a line directly across a photograph.
- (9) Do not use paper clips directly on a photograph. Protect the photographs with heavy paper or light cardboard.
- (10) Do not fold or crease photographs.

8. SPECIAL GRAPHICS

Use oversized illustrations, such as engineering drawings, only when no acceptable substitutes for them are available. Such illustrations are difficult and expensive to reproduce. When they must be used, assign them figure numbers and captions as you would any other illustration.

For instructions about their use and special handling, contact the Policy and Publications Management Branch of the Division of Technical Information and Document Control.

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APPENDIX E
REPORT MECHANICS

1. INTRODUCTION

This appendix provides guidance on chapter dividers, type of paper to be used, document appearance and page numbering, and preferred spelling and usage. Attention to details such as these provides another degree of consistency in NRC documents.

2. APPEARANCE

2.1 Typing Instructions

Type paragraphs single spaced, flush left in block style (no paragraph indentations). Double space between paragraphs and double space before and after headings. This document is typed in block style.

2.2 Margins (Image Area)

The contents of the document should be printed within the image area of each page. The image area is the area on the page bound by the margins on each edge of the paper. The top, bottom, and right-hand margins should each be one-inch wide. The right and left-hand margins should be one and one-fourth inches wide.

2.3 Photocopied Text

In the event that duplicate copies of the report are made, each copy should have qualities similar to those of the original; that is, the copied characters should be complete, with no light patches on the page. Pages reproduced by photocopying machines are not acceptable as camera-ready material. Photographically reproduced pages (using photographic print paper) are acceptable.

3. PAGINATION

Number all pages of draft and final reports. Paginate consecutively throughout, with small Roman numerals for all front matter and Arabic numerals for the text, the reference section, bibliography, appendixes, etc. If the organization of a document is clarified by pagination within each section of the text, number the front matter pages with small Roman numerals and text pages with arabic numerals using the double-numbering method (for example, 1-4 or 5-25). Final reports are printed on both sides of the paper; therefore, all left-hand pages must carry even numbers, and all right-hand pages, odd numbers.

New chapters may begin on a new left- or right-hand page. Page numbers should be centered one-half inch above the bottom of the typing guide.

4. PAPER

Use plain, white, bond paper without company or agency letterhead or logo.

5. CHAPTER DIVIDERS

The use of colored paper or heavier weight paper as chapter dividers for final documents is discouraged. Although there are several ways of incorporating separating devices in a bound text, the most reasonable divider (least costly in time of preparation as well as money) is a margin thumb index in which a solid printed mark (much like a tab) bleeds* to the outside edge of the paper. This type of index is often keyed on the back of the outside cover of a publication. If this be the case, the bleeding margin index is printed on the left margin of a left-hand page of the divider area or sheet.

6. SPELLING

The authorities used by NRC for spelling, usage, and word division are Webster's Third New International Dictionary and the GPO Style Manual.

7. PREFERRED USAGE

7.1 Compounding and Hyphenation

Compound words are combinations of two or more words that are written either as one word or hyphenated: man-year, greenhouse, light-year. To determine whether a compound word should or should not be hyphenated, check a recent edition of an office dictionary. For a concise discussion of general rules for compounding, see the GPO Style Manual, Chapters 6 and 7.

When applying the general rules for compounding to nuclear engineering, the following terms are not usually hyphenated: critical heat flux, fast flux test facility, nuclear steam supply system, or radioactive waste disposal classification system. However, chemical elements used in combination with numbers (uranium-235) or chemical formulas (Cr-Ni-Mo) require hyphens. A hyphen is also required with elements of technical compound units of measurement, such as kilowatt-hour, volt-ampere, centimeter-gram-second.

Be careful to distinguish between compound words and unit modifiers. Use hyphens in unit modifiers: gas-cooled reactor, full-scale test, loss-of-coolant accident.

7.2 Word Usage

This section provides guidance to the correct use of frequently misused words and expressions.

accuracy, precision

Accuracy is the agreement between the true value and the result obtained by measurement.

*The ink is intentionally printed to the outside edge of the paper, thus providing easily visible divider marks.

Precision is the agreement among repeated measurements of the same quantity.

activate, actuate

Both words mean "to make active," although actuate is usually applied only to mechanical processes.

Example: The relay actuates the trip hammer.

Activate has a wide range of applications to chemical processes, all of which apply to nuclear science: to make (something) radioactive, luminescent, photosensitive, photoconductive, more adsorptive, etc.

effect, effect

Affect is a verb that means to influence.

Example: The Commission's decision affected all licensees.

Effect can function either as a verb that means to bring about or to cause, or as a noun that means a result.

Examples: The Chief effected several changes in the Branch that had a good effect on morale.

Avoid using effect as a verb. A less pompous-sounding substitute, like made, is preferable.

alternate, alternative

To alternate (verb) is to occur in successive turns.

An alternative (noun) is a choice among mutually exclusive objectives or courses of action.

analyze, determine, identify

To analyze is to separate into parts so as to determine the nature of the whole.

To determine is to ascertain definitely, as after an investigation or calculation.

To identify is to name a thing, to ascertain its origin, nature, or characteristics.

and/or

Avoid this expression. State your meaning exactly.

Change: Submit X and/or Y with your application, as appropriate.

To: Submit X or Y or both with your application, as appropriate.

Example: Since all of the inspections proved the plant to be operable, the proposed startup schedule was approved.

compose, comprise, consist, include

Compose means "to create" or "to make up" of something.
Parts compose (make up) a whole

Example: Cement, aggregate, and water (the parts) compose concrete (the whole).
Concrete is composed of cement, aggregate, and water.

Comprise means "to embrace" or "to include." The whole comprises the parts.

Example: A botanical garden (the whole) comprises trees, flowers, and other plant life (the parts).

Consist means that all parts making up a whole are listed, but include does not.

Examples: Concrete consists of cement, aggregate, and water.

Concrete includes cement and aggregate.

conclude, decide, determine

To conclude is to decide or judge after careful consideration.

To decide is to make up one's mind, as after doubt or debate.

To determine is to establish or ascertain definitely.

continual, continuous

Continual means intermittent or repeated at intervals.

Continuous means without interruption in time, or of unbroken extent in space.

data

Although data is sometimes used as a singular noun, the plural construction is the more appropriate in technical reports. Used as a plural, data must be referred to by plural pronouns and modifiers: those, many, few.

Do not use data generically when a more specific term, such as compilation, list of values, physical dimensions, experimental observations, or numerical results would be more precise.

The singular form of data, datum, is seldom used except in surveyor's terms like datum line and datum plane.

apt, liable, likely

Apt means exactly suitable, to the point, appropriate.

Liable means "legally subject to" or "responsible for" and connotes legal responsibility.

Likely means probable.

as, like

As (conjunction) means to the same degree or quantity that; it is often used to indicate a correlative.

Like (preposition) is used to mean possessing the characteristics of something or resembling closely. It is not appropriate to use like as a conjunction in formal language and especially written language.

assure, ensure, insure

Assure, ensure, and insure all mean "to make secure or certain."

Assure refers to persons, and it alone has the sense of setting a person's mind at rest.

Example: The health physicist assured the concerned public that there was no risk of exposure to radiation from the normal operation of the proposed plant.

Both ensure and insure mean "to make secure from harm." However, only insure has the connotation of guaranteeing life or property against risk and should be reserved for use only in this sense.

Example: A closely followed inspection schedule will ensure proper operation of the monitoring instruments.

balance, remainder

Balance means both "a state of equilibrium" and "the amount remaining in a bank account after balancing deposits and withdrawals."

Remainder always means "what is left over." Use remainder to mean "what is left over" outside of bookkeeping contexts.

because, since

Because is the strongest and most specific connective used to state a causal relationship.

Example: He was kept under observation because his dosimeter indicated exposure to radiation.

Since is a weak substitute for because when expressing cause. It is, however, the appropriate connective when the emphasis is on circumstances or conditions rather than on cause and effect.

definite, definitive

Definite means unmistakable, precise, or having certain limits.

Definitive refers to something complete or authoritative.

due to, because of

Due to in the sense of "caused by" is acceptable in phrases following a verb form of "to be."

Example: His fall was due to carelessness.

Due to is not acceptable when it follows a noun or verbs and is used to mean "because of."

Change: He fell due to carelessness.
To: He fell because of carelessness.

etc.

A series introduced by the words "includes" or "such as" should not be followed by etc. because the phrases, taken together, are redundant. (Etc., when used in text, is followed by a comma except when it ends a sentence.)

factor

Factor has a precise mathematical meaning. Do not use it unnecessarily even in mathematical contexts, however. The expression "to increase by a factor of 3" means simply to triple--use triple.

farther, further

Farther refers to distance.

Further indicates additional degree, time, or quantity.

Example: As you go farther away, your ability to hear is further decreased.

fewer, less

Fewer refers to units or individuals.

Less refers to mass or bulk.

Example: With the use of less powder, fewer particles result.

foreword, forward, preface

Forward is very often confused with the word foreword. Even though forward describes a position of something located toward the front, it is not the correct word to describe introductory material in a report. The term foreword usually applies to a statement about a book or report written by someone other than the author. A preface is usually a statement by the author that describes the purpose, background, or scope of a book or report. (See the preface of this guide for an example.) The terms foreword and preface are often used interchangeably.

i.e., e.g.

i.e. means "that is."

e.g. means "for example."

Note: Their English equivalents are preferable to avoid misuse, overuse, and pompousness.

impact, impacted

Impact used as a noun means the actual striking of one body against another, or the impression of one thing on another.

Impact used as a verb means to cause to strike forcefully.

Impacted is an adjective that is often misused when the word impact should apply.

imply, infer

Imply indicates by association or consequence rather than by direct statement.

Example: The neatness of the report implies that the typist is proud of her work.

Infer derives a conclusion from facts or premises.

Example: We infer that the hyphenation is correct.

interpolate, extrapolate

You interpolate (meaning estimate) between two known values.

You extrapolate (meaning infer or predict) from the values of a known series.

mutual, common

Mutual refers to two persons or things, and means reciprocally exchanged.

Common means shared by all.

on the order of

Do not use on the order of to mean about or approximately. If you mean "within an order of magnitude," say so.

only

Place only immediately before the word or phrase it modifies. Note the difference in meaning caused by the word's location in the following sentences:

Examples: He was the only engineer.

He was only the engineer.

opposed to, compared to

Do not use opposed to unless you mean in literal opposition; use compared to instead.

Examples: Force a is opposed to force b, and is stronger.

Force a compared to force b is several times greater.

order of magnitude

Use this phrase to express measurements in powers of 10 only, not to mean "approximately."

Example: The earth's mass is about 10^{24} kg; that of the sun, 10^{30} kg. Their masses differ by about six orders of magnitude.

parameter, property

A parameter is an arbitrary constant or an independent variable through functions of which other functions may be expressed.

Examples: The parameters for the first test were 6 to 12 V.

Four parameters, three in space and one in time, are needed to specify an event.

A property is an explicit value or characteristic.

Example: One of the most important properties of iodine is its low temperature of sublimation.

practical, practicable

Practical means useful in actual practice.

Practicable means capable of being put into practice.

presently, currently

Presently means in a short time, soon, directly. It does not mean now or at this time. To denote now, use currently.

principal, principle

As a noun, principal means head or chief; as an adjective, it means highest or best.

Principle means basic truth, law, or assumption.

prior, before

Prior is an adjective meaning earlier in time or order.

Before as an adverb means in advance; as a preposition it means in front of or preceding.

Example: He was hired according to prior agreement, an agreement reached before his arrival.

procure

Procure is an overworked word. We prefer buy, get, or purchase.

proved, proven

Proved is preferred as the past participle of the verb to prove.

Example: He has proved his point.

Proven is better used as an adjective.

Example: He has a proven record of achievement.

providing, provided, if

Do not use providing in the place of provided or if.

Example: Providing jobs is difficult now, but will be easier provided (if) next year's budget is adequate.

that, which

That is appropriate to restrictive (defining) clauses that are not set off by commas.

Example: These frequencies, which increase exponentially with voltage, can cause perturbations that are self-propagating.

which is appropriate to nonrestrictive (nondefining) clauses that are always set off by commas.

via

Via is Latin for "by way of." Restrict its use to routing instructions.

Example: The package was sent to Bethesda via Region I.

Do not use via to mean through or as the result of outside of such contexts.

viz

Use namely or that is instead of viz when introducing examples, lists, or items.

whether, if

Whether implies a condition of doubt.

Example: He was not sure whether security was breached.

If implies no alternative.

Example: If it does not rain, we will move the equipment.

while, although, whereas

The noun while, when used in adverbial phrases, indicates a period of time (during or at the same time as). When used as a conjunction, while means "as long as" in reference to time. While should not be used in the place of although, whereas, and or but.

Although (conjunction) means regardless of the fact that or even though.

Whereas (conjunction) means in view of the fact that and is commonly used to indicate a comparison or contradiction.

7.2.1 Deadwood

The following unwieldy or repetitious word groups should be avoided.

Deadwood Expression

as far as our own observations
are concerned, they show
ascertain the location of

Clearer Substitute

we observed
find

Deadwood Expression

at that point in time
at the present time
at this point in time
be deficient in
close proximity
come to a conclusion
consensus of opinion
concerning this matter, it
 may be asserted that
conducted irradiation
 experiments on
due to the fact that
during the time that
elongate in length
equally as well
fewer in number
for the purpose of
for the reason that
give indication of
happen to be
if conditions are such that
in a manner similar to
initial prototype (model)
in the direction of
in the vicinity of
in view of the fact that
is in a position to
it is our opinion that
it is possible that
it was discovered
it would thus appear that
lenticular in character
necessitates the inclusion of
notwithstanding the fact that
null and void
of such hardness that
present in greater abundance
red in color
round in shape
rules and regulations

serves the function of being
subsequent to
the question as to
there can be little doubt that
two equal halves
utilize or utilization
with reference to
with the exception that

Clearer Substitute

then
now
now
lack
close (or proximate)
concluded
consensus

we assert

irradiated
because
while
elongate
as well, equally well
fewer
for
because
show, indicate
are
if
like
prototype
toward
near
because
can
we think
perhaps
I (we) discovered
apparently
lenticular
needs, requires
although
null, void (use one, not both)
so hard that
more abundant
red
round
rules, regulations (use one,
not both)
is/functions as
after
whether
probably
halves
use
about
except that

7.3 Sex-Neutral Language in NRC Publications

A Presidential Memorandum (August 1977) and numerous Federal guidelines urge the cooperation of all Federal agencies in eliminating gender-specific terminology from regulations, policy and program statements, correspondence, reports, and all other pertinent materials. These guidelines, in essence, ask that gender-specific references be avoided unless they are necessary.

The use of precise language will eliminate most gender-specific terms. References to him or his can be eliminated by referring instead to "licensee," "applicant," "operator," "administrator," etc. Detailed guidance on the use of sex-neutral language is provided in the following publications, which are available at NRC's Technical Library.

Office of the Federal Register. "Legal Drafting Style Manual."
(Interim Ed.) March 1978.

U.S. Commission on Civil Rights. "Sex Bias in the U.S. Code." April 1977.

U.S. Department of Labor. "Job Title Revisions to Eliminate Sex and Age Referent Language from the Directory of Occupational Titles."
3rd ed. 1975.

B. BIBLIOGRAPHY

U.S. Government Printing Office. Style Manual. Washington, DC: U.S. Government Printing Office, January 1973. Available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Webster's Third New International Dictionary of the English Language, Unabridged. Springfield, MA: G&C Merriam Co., 1971. Available from public and technical libraries.

APPENDIX F

TECHNICAL WRITING BOOKS AVAILABLE FROM NRC'S TECHNICAL LIBRARY

NRC's Technical Library maintains a collection of technical writing books for staff use. Consult them for further information on specific writing topics. This appendix lists the books currently available.

The American Institute of Biological Sciences. Conference of Biological Editors Style Manual. Washington, DC: American Institute of Biological Sciences, 1972.

The American Institute of Physics. The American Institute of Physics Style Manual for Guidance in the Preparation of Papers for Journals. New York: The American Institute of Physics, 1973.

Beress, R. Scientists Must Write. London: Chapman and Hall Ltd., 1978.

Brusaw, C. T., and G. J. Alred. Practical Writing: Composition for the Business and Technical World. Boston: Allyn and Bacon, Inc., 1973.

Brusaw, C. T., G. J. Alred, and W. E. Olfu. Handbook of Technical Writing. New York: St. Martin's Press, 1976.

Gilman, W. The Language of Science: A Guide to Effective Writing. New York: Harcourt, Brace and World, Inc., 1961.

Hicks, T. G. Writing for Engineering and Science. New York: McGraw-Hill Book Co., 1961.

Houp, K. W., and T. E. Pearsall. Reporting Technical Information. Beverly Hills, CA: Glencoe Press, 1968.

Jordan, S., ed. Handbook of Technical Writing Practices, 2 vols. New York: John Wiley and Sons, Inc., 1971.

Leggett, G., C. D. Mead and W. Chervatt. Handbook for Writers. 6th ed. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1974.

Morris, J. E. Principles of Scientific and Technical Writing. New York: McGraw-Hill Book Co., 1966.

Peterson, M. S. Scientific Thinking and Scientific Writing. New York: Reinhold Publishing Corporation, 1961.

Souther, J., and M. L. White. Technical Report Writing. 2nd ed. New York: John Wiley and Sons, Inc., 1977.

Turabian, K. A Manual for Writers of Term Papers, Theses and Dissertations. 4th ed. Chicago: University of Chicago Press, 1973.

Virkus, T. E. Communication and the Technical Man. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1972.

GLOSSARY

Contractor Document: A document prepared in accordance with the provisions of a contract or under or pursuant to an interagency agreement.

Formal Contractor Reports: Regulatory and technical documents that record the results of contractor or interagency agreement work at principal points in the program. Such documents may include, but are not limited to, quarterly and annual progress reports and final reports. Prior to publication, these documents shall have received the reviews and approvals required by NRC. Such reviews and approvals shall include, but not necessarily be limited to, patent review (if applicable) and security review (if applicable). These reports will carry NUREC designations as the prime identification.

Formal Staff Reports: Regulatory and technical documents prepared in support of regulatory investigations that become publicly available records.

Informal Contractor Documents: Regulatory and technical documents prepared in accordance with contract or interagency agreement requirements for recording plans and results during the course of the work. Such documents may include, but are not limited to, informal progress reports, quick-look reports, data reports, status summary reports, project descriptions, pre-test predictions, model verifications, experiment safety analyses, experiment operating procedures, facility certification reports, and test result reports.

Level of Confidence: Degree of certainty; for example, confidence level as used in statistics.

NRC Program Project Sponsor: The NRC individual responsible for the performance of a consultant or a contractor and his subcontractor or work performed under or pursuant to an interagency agreement.

Patent Review: Review by legal staff to assure protection rights in inventions.

Publicly Available: Available to the general public in the NRC Public Document Room (PDR) for inspection and copying for a fee or ordinarily available from a public library.

Regulatory and Technical Documents: Documents that have been prepared in support of regulatory investigations and are to become publicly available records. Such documents shall carry unique identification.

Unique Identification: NRC identification used on a document and its attachments, revisions, and supplements that is not used on any other document.

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