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Nuclear Weapon Detection
Categorization Analysis

DOE/OR/21400--7500

Special Projects Office
National Security Program Office

and

Defense Special Weapons Agency (DSWA)

December 1997

Prepared by:
National Security Program Office
Oak Ridge, Tennessee 37831
managed by
LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC05-84OR21400

Oak Ridge National Laboratory
managed by
LOCKHEED MARTIN ENERGY RESEARCH CORPORATION
for the
U.S. DEPARTMENT OF ENERGY
under Contract No. DE-AC05-96OR22464

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**STATEMENT OF WORK
FOR
OAK RIDGE NATIONAL LABORATORY
NUCLEAR WEAPON CATEGORIZATION ANALYSIS**

1.0 SCOPE:

This statement of work is for the Proof of Concept for nuclear weapon categories utility in Arms control. The focus of the project will be to collect, analyze and correlate Intrinsic Radiation (INRAD) calculation results for the purpose of defining measurable signatures that differentiate categories of nuclear weapons. The project will support START III negotiations by identifying categories of nuclear weapons. The categories could be used to clarify sub-limits on the total number of nuclear weapons.

1.1 BACKGROUND:

In the U.S. and Russia Presidents' Joint Statement on the Future Reduction of Nuclear Arms, dated 21 March 1997, the two President's agreed:

Once START II enters into force, the United States and Russia will immediately begin negotiations on a START III agreement, which will include, among other things, the following basic components:

Establishment, by December 31, 2007, of lower aggregate levels of 2,000 - 2,500 strategic nuclear warheads for each of the parties.

Measures relating to the transparency of strategic nuclear warhead inventories and the destruction of strategic nuclear warheads and any other jointly agreed technical and organizational measures, to promote the irreversibility of deep reductions including prevention of a rapid increase in the number of weapons.

The requirement to identify and inventory nuclear weapons in the START III environment encompasses several unique challenges. First is the ability to specifically assess characteristic signatures of a nuclear weapon or nuclear weapon component without divulging Critical Nuclear Weapons Design Information (CNWDI). The second is to categorize the nuclear weapon or component signatures into classes suited for START III application such that they are useful for nuclear accountancy.

INRAD calculations predict radiation signatures of U.S. nuclear weapons. The original purpose of these calculations was to ensure the safety of personnel working in the vicinity of the storage containers in connection with stockpile maintenance. The INRAD calculations provide the best source of information to study specific trends in radiation spectra or signatures of nuclear weapons. The intent of this project is to assess whether the signatures can be used to identify specific categories of nuclear weapons that can be applied to nuclear accountancy.

2.0 OBJECTIVE:

The mission need is to demonstrate the ability to uniquely and accurately identify nuclear warheads or their components. Such a capability is deemed necessary to implement potential future arms control regimes involving strategic and tactical nuclear weapons and/or weapons components. The future requirement for such tools or systems is clearly forecast in the U.S.-Russian Joint Summit Statements of September 1994 and May 1995 and amplified by President Clinton's Address to the 51st United Nations General Assembly, and most recently in the March 1997 Helsinki Summit "Joint Statement on Parameters on Future Reductions in Nuclear Forces."

3.0 TASKS

3.1 GENERAL:

This project will generate UNCLASSIFIED categories of U.S. nuclear weapons that can be used in establishment of sub-limits in a START III verification regime. INRAD calculations will be made available from Strategic Command J53 (STRATCOM/J53) based upon the projected composition of the U.S. stockpile.

3.2 Project Management and Oversight

3.2.1 Plan of Action and Milestones (POA&M)

This task requires ORNL to deliver a project schedule with milestones, cost and task description. ORNL shall modify and update this plan based on review by Field Command Defense Special Weapons Agency (FCDSWA). It will be used to track and report costs and project technical status monthly to FCDSWA. ORNL shall deliver the POA&M within 15 days of Interagency Cost Reimbursement Order (IACRO) acceptance.

3.2.2 Monthly Reports

Prepare Cost and Performance reports on a monthly basis. The reports shall be submitted by the 15th day of each calendar month to FCDSWA.

3.2.3 Support and attend the DSWA Arms Control Conference.

3.2.4 Support project reviews and status meetings to assess progress.

3.3 Develop an unclassified categorization scheme(s)

3.3.1 Obtain and consolidate information regarding the composition of the future U.S. stockpile from Strategic Command (STRATCOM/J53).

3.3.2 Evaluate information obtained under Task 3.3 and analyze the data for the purpose of defining unique signatures or trends which can be used to establish an UNCLASSIFIED categorization scheme. Delineate the associated level of confidence for each.

3.3.3 Prepare and submit a final report detailing the findings of the project effort and the categorization scheme developed. Include the methodology used to evaluate the INRAD calculations. List factors used in defining the categories. Include the specific radiation spectra data from the INRAD calculations. A summary of the projected U.S. stockpile weapons listed by category shall be included.

4.0 TRAVEL

ORNL is expected to travel for the project and will travel on project dollars. For planning purposes ORNL shall plan for 1 two-person trip to Washington DC, one, two-person trip to the FCDSWA, Kirtland, AFB, NM, and one, two-person trip to the DSWA Arms Control Conference tentatively to be held in Chicago.

5.0 SCHEDULE

This project is expected to complete within 11 months of IACRO acceptance. The following schedule is provided for guidance. This schedule assumes IACRO acceptance by 30 December 1997.

Task	Description	Date
3.2.1	Plan of action and milestones	30 Dec 97
3.2.2	First Monthly Report	15 Jan 98
3.2.2	Subsequent monthly reports	15th of the month
3.2.3	DSWA Arms Control Conference	June 98
3.3.1	Obtain Stockpile Information	Dec 97
3.3.2	Evaluate INRAD data	June 98
3.3.3	Final report	Sep 98

6.0 DELIVERABLES

6.1 Plan of Actions and Milestones.

6.2 Monthly Cost and Performance Reports.

6.3 Final Report.

7.0 PROGRAM MANAGEMENT:

This project is part of the nuclear warhead accountancy program at DSWA Verification Technology Strategic Arms Control Division. Project Management will be out of Field Command Defense Special Weapons Agency, Verification Technologies Branch (FCDSWA/FCICV).

8.0 PROJECTED PERSONNEL

Program Manager	Mike Maston	NSPO
Principal Investigators	Robert Uhrig	ORNL
	Richard Wood	ORNL
Technical Contributors	Support Staff	ORNL

9.0 ESTIMATES - Includes Overhead

Overall: FY 1998 1.20 FTEs \$300,000 Material/Labor

DEPARTMENT OF ENERGY (DOE)
OAK RIDGE OPERATIONS OFFICE (ORO)
ADMINISTRATIVE REQUIREMENTS FOR INTERAGENCY ACQUISITIONS

TABLE OF CONTENTS

I.	<u>Authority</u>	2
	1. <i>DOE Procedures:</i>	2
	2. <i>Task Limitations:</i>	2
II.	<u>Stop Work Procedures/Terminations</u>	2
	1. <i>Project Modification</i>	2
	2. <i>Disputes</i>	2
III.	<u>Funds Management</u>	3
	1. <i>Funds Obligation</i>	3
	2. <i>Work Performance</i>	3
	3. <i>Full Funding</i>	3
	4. <i>Sample Statement</i>	3
	5. <i>Financial Policy</i>	4
IV.	<u>Invoicing Procedures</u>	4
	1. <i>Billing Agent</i>	4
	2. <i>Reimbursement to DOE</i>	4
V.	<u>Intellectual Property Rights</u>	4
VI.	<u>Conduct of Classified Projects</u>	4
VII.	<u>Project Close Out</u>	5
	1. <i>Construction Activities</i>	5
	2. <i>Equipment Disposition</i>	5
VIII.	<u>Organizational Conflicts of Interest</u>	5
	1. <i>DOE Contractual Safeguards</i>	5
	2. <i>Open Competition</i>	5
IX.	<u>Audits of Projects</u>	5
X.	<u>Environmental, Safety, and Health Compliance</u>	5
XI.	<u>Points of Contact</u>	6

**DEPARTMENT OF ENERGY (DOE)
OAK RIDGE OPERATIONS OFFICE (ORO)
ADMINISTRATIVE REQUIREMENTS FOR INTERAGENCY ACQUISITIONS
DOE-ORO PROPOSAL No. (2216-M110-A1)**

I. Authority

1. *DOE Procedures:*

All work will be performed in accordance with DOE Order 481.1, subject: "Work For Others (Non-Department of Energy Funded Work)" and assigned to Lockheed Martin Energy Systems, Inc., under DOE Management and Operating (M&O) Contract No. DE-AC05-84OR21400, and/or Lockheed Martin Energy Research Corporation, under DOE M&O Contract No. DE-AC05-96OR22464, hereafter referred to as M&O Contractor(s).

2. *Task Limitations:*

All interagency acquisitions accepted by DOE-ORO will be executed under DOE project management and financial management procedures. The work will be performed on a best effort basis and neither DOE, the M&O Contractor(s), nor persons acting on their behalf will be responsible for failure to:

- a. perform their services, or
- b. furnish the materials or information hereunder,

at any particular time or in any specific manner. Furthermore, DOE and the M&O Contractor(s) hereby specifically disclaim any and all warranties, express or implied, including any warranty of merchantability or fitness for any purpose.

II. Stop Work Procedures/Terminations

1. *Project Modification:*

This project may be modified by mutual consent of both the Defense Special Weapons Agency (DSWA) and DOE at any time or may be terminated by either agency upon a thirty day (30) advance written notice to the other. In the event DOE chooses to unilaterally terminate this project, DOE will attempt to mitigate closeout costs. In the event of termination of the project or a task(s) under the project by either agency, DOE will be reimbursed by the DSWA for costs required to terminate the task(s) activities, to include shipping of materials, software, hardware, etc.

2. *Disputes:*

In the event of a dispute between the DSWA and DOE or the M&O Contractor(s), no authorized final decision will be issued without the concurrence of the contracting officers of both the DSWA and DOE. If the dispute cannot be resolved, the contracting officers will agree upon a third-party forum to settle the dispute.

III. Funds Management

1. *Funds Obligation:*

The Treasury appropriation account symbol must be added to the funding authorization, along with the obligational expiration date and the date the appropriation closes for payment purposes. Funds shall be considered obligated upon DOE's acceptance of the funds and issuance of direction by letter to the M&O Contractor(s). As DOE is obligating the funds for this project under contract with the M&O Contractor(s), it is recommended that no project expiration dates be added to the funding document and that any schedules or delivery dates be expressed in the project task description.

2. *Work Performance:*

Performance by DOE/M&O Contractor(s) shall continue until one or more of the following conditions are met:

- a. Completion of the Statement of Work and Task Closeout;
- b. Expenditures/commitments equal the amount authorized for this task;
- c. Task termination by either party to this project;
- d. Work completion date if specified in the funding document. DOE cannot accept work completion dates not mutually agreed to by both parties. (Work completion dates are not to be confused with obligation expiration dates.)

3. *Full Funding:*

Based on common Federal financial policy outlined in the Department of Treasury Financial Manual (and implemented in DOE Orders), work performed for other federal agencies shall be fully funded prior to commencement of work if the task(s) is to be completed within the current fiscal year. For a task(s) that transcends the fiscal year, full funding for the current fiscal year plus the first three months of the following year shall be required. If your agency is unable to provide full funding at this time due to internal budget allocation processes, you must submit a request to waive this full funding requirement to the DOE-ORO Work For Others Coordinator shown in Section XI.

4. *Sample Statement:*

DOE requires this statement or equivalent to be placed on the funding authorization document prior to accepting funds to perform work.

This agreement is entered into pursuant to the authority of the Economy Act of 1932, as amended, 31 USC §1535 [or, cite here another statutory reference], and adheres to Federal Acquisition Regulation (FAR) 6.002. To the best of our knowledge, the work requested will not place DOE and its contractor in direct competition with the domestic private sector. The DSWA recognizes that this work will be performed in accordance with the DOE-ORO Work For Others (WFO) Administrative Requirements for Interagency Acquisitions attached to DOE-ORO Proposal Number 2216-M110-A1.

5. Financial Policy:

The DOE executes its financial management accountability for billing and reimbursement procedures in accordance with Titles 2 and 4 of General Accounting Office Manual for Guidance of Federal Agencies and Volume I, Part 6, Chapter 8000 of the Treasury Financial Manual. DOE will account for and control funds by individual funding document as specified by the DOE Accounting Handbook, Chapter 13, unless specific written instructions to the contrary are received from a certifying official of the DSWA.

IV. Invoicing Procedures

1. Billing Agent:

Billing will be performed on behalf of DOE by the M&O Contractor(s) Accounts Receivable Department to the billing address indicated on each funding authorization. Billing is performed monthly for the costs recorded during the previous month on an SF 1080 to reimburse the DOE appropriation for actual cost incurred.

2. Reimbursement to DOE:

The DSWA cannot withhold or delay reimbursement to DOE. The Economy Act of 1932, as amended, (31 USC §1535), states, "*Payment shall be made promptly by check on the written request of the agency or unit filling the order. Payment may be in advance or on providing the goods and services ordered and shall be for any part of the estimated or actual cost as determined by the agency or unit filling the order. A bill submitted or a request for payment is not subject to audit or certification in advance of payment. Proper adjustment of amounts paid in advance shall be made as agreed to by the heads of the agencies or units on the basis of the actual cost of goods or services provided.*"

V. Intellectual Property Rights

Inventions made in performance of this work may fall within the DOE-issued Class Patent Waiver to the M&O Contractor(s) and the M&O Contractor(s) may elect to retain title to such inventions subject to retention by the Federal Government of march-in-rights and a non-exclusive, non-transferrable, irrevocable, paid-up license to practice or have practiced for or on behalf of the U.S. the invention throughout the world.

VI. Conduct of Classified Projects

Security requirements to be followed in performance of the work will be in accordance with applicable DOE Orders. If classified work or access to classified information of the sponsor is involved, the DSWA is required to provide to DOE applicable classification guidance and any new guides/updates as they are developed. Before work begins or classified matter is received or transmitted, a classified mail and/or shipping channel shall be established and approved by the appropriate DSWA certifying official. Failure to provide classification guidance will result in DOE performing the work in a completely unclassified mode.

VII. Project Close Out

1. *Construction Activities:*

Title of permanent construction on DOE Sites will pass to DOE upon completion of construction and acceptance by DOE.

2. *Equipment Disposition:*

If equipment is acquired as part of the project, such equipment will be accounted for and maintained during the term of the project in the same manner as DOE property. When the project ends or is terminated, disposition of the equipment will be as previously agreed to or as instructed by the requesting agency. This equipment may be delivered to the requesting agency's location, transferred to DOE, or declared as excess. The DSWA will be responsible for costs of shipping any items.

VIII. Organizational Conflicts of Interest

1. *DOE Contractual Safeguards:*

The DSWA recognizes that the M&O Contractor(s) will perform the work assigned to DOE under this project pursuant to the "Related Services" provision of the DOE/M&O contract(s). The DOE approved internal procedure governing access to and flow of information between the M&O Contractor(s) and its affiliate organizations will apply to all work performed under the terms of this project. These procedures are subject to DOE audit at all times. In accordance with the Organizational Conflict of Interest terms of said contract, the M&O Contractor(s), including any of its officials who may acquire information as part of their management responsibilities, is prohibited from further disseminating any third-party proprietary data or government sensitive data/information, as indicated by restrictive markings identifying the data and information so protected, to its affiliated organizations.

2. *Open Competition:*

In view of the above, the sponsoring agency hereby agrees that affiliates of the M&O Contractor(s) shall not be restrained or restricted from competing for any related follow-on contracts or subcontracts to be awarded by the sponsoring agency which relate to work under this project.

IX. Audits of Projects

The Defense Contract Audit Agency (DCAA) audits DOE contractors and subcontractors including those who perform Work For Others projects. These audits may disclose a need for adjustments to overhead rates or other applicable charges. Should this occur, the DSWA would be responsible for any additional costs as a result thereof.

X. Environmental, Safety, and Health Compliance

All DOE work activities, including Work For Other Federal Agencies conducted by DOE and DOE M&O Contractor(s), shall comply with applicable environmental, safety, and health (ES&H) statutes, regulations, standards, etc. Associated costs for normal ES&H compliance as part of the routine project actions will be the responsibility of the DSWA.

XI. Points of Contact

Department of Energy, Oak Ridge Operations Office, Project Contacts:

R. N. Collier

Program Manager
Department of Energy
Y-12 Site Office
Post Office Box 2009
Oak Ridge, Tennessee 37831-8009
(423) 576-9254

Donna J. Phillips

Work for Others Coordinator
Department of Energy
Oak Ridge Operations Office
Post Office Box 2001
Oak Ridge, Tennessee 37831-8550
phone (423) 576-0395
fax (423) 576-2554

M&O Contractor Contact:

Mike Maston

Lockheed Martin Energy Systems, Inc.
Y-12 Site
National Security Programs Office
Post Office Box 2009
Building 9113, Mailstop 8206
Oak Ridge, Tennessee 37831-8206
phone (423) 576-0599

Defense Special Weapons Agency Project Contact:

Captain Phillip Hezeltine

Defense Special Weapons Agency
Field Command
1680 Texas Street, SE
Kirtland AFB, New Mexico 87117-5669
phone (505) 853-0654