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OFFICE OF AEROSPACE STUDIES (AFMC)
KIRTLAND AIR FORCE BASE, NM

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FROM: OAS/XRN
2350 Maxwell Street
Kirtland AFB NM 87117-6008

8 October 1992

SUBJ: HPRF Phase 2 Kickoff Meeting Minutes

TO: Distribution

1. Enclosed is the meeting minutes from the HPRF Phase 2 Kickoff Meeting held on 10-11 September 1992 at Phillips Laboratory in Albuquerque, NM.
2. Capt Lamb and I would like to thank all who participated in the meeting. We look forward to working with you on the Phase 2 study.
3. Attachment 2 contains Restricted Data/Critical Nuclear Weapon Design Information.
4. This letter is UNCLASSIFIED when separated from Attachment 2.

ROGER F. KROPF, Major, USAF
Chief, Nuclear Weapons Concept Div

- 2 Atch
1. Distribution List (U)
 2. HPRF Phase 2 Kickoff Meeting Minutes (U),
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High Power Radio Frequency (HPRF) Phase 2 Study

Kickoff Meeting Minutes (U)

30 September 1992



Captain William A Lamb

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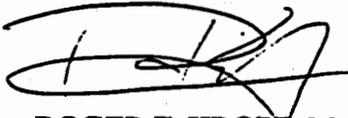
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Chief, Nuclear Weapons Concept Division



JERRY G. COLYER
Technical Director,
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30 September 1992

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ACKNOWLEDGEMENTS

(U) I would like to take this opportunity to thank Mr Sam Gutierrez of Phillips Laboratory who helped me during the HPRF Phase 2 Kickoff Meeting. His efforts prior to and during the meeting helped immensely and were greatly appreciated.

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(U) INTRODUCTION

(U) The Nuclear Weapons Concept Division of the Office of Aerospace Studies (OAS/XRN) conducted the kickoff meeting for the High Power Radio Frequency (HPRF) Phase 2 study on 10-11 September 1992. The meeting was held at Phillips Laboratory on Kirtland AFB, NM. The purpose of the meeting was to review the tasking for the phase 2 study, refine the working group structure, identify memberships in each working group, and discuss the organization and structure. The individual working groups met to finalize their structure, goals and memberships. The agenda for the meeting is contained in appendix A.

(U) These meeting minutes document the kickoff meeting and include copies of presentations. Additionally, a list of attendees is provided in appendix B. The meeting highlights are presented in the following paragraphs.

(U) ADMINISTRATION AND INTRODUCTIONS

(U) Major Kropf opened the meeting by welcoming all in attendance. He then presented an overview of the importance of the HPRF Phase 2 study. Each of the attendees then introduced themselves and their organizations. The Navy was represented in this meeting but only as observers.

(U) HPRF PHASE 2 TASKING AND REQUIREMENTS

AM LtCol Martin reviewed the draft Phase 2 Tasking Letter (see appendix C). Since there was no change to the tasking requirements presented in the planning meeting, LtCol Martin reviewed the contents of the finalized tasking. He reiterated the missions of interest that were not addressed in the phase 1 study and reemphasized the issues for phase 2. The approach to validation of lethality methodology must be reported to the Nuclear Weapons Council Standing Committee (NWCSC) within 90 days after the kick-off meeting. This will require reporting to the NWCSC by December 15th. Additionally, further examination of the delivery systems, packaging options, and damage expectancy with regards to mission effectiveness will be addressed.

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(U) PHASE 2 STUDY ORGANIZATION

(U) Capt Lamb proceeded to outline the working group structure for the Phase 2 study. Figure 1 shows the working group structure. Discussions centered around the need for a separate threat working group but a consensus was reached that there would be

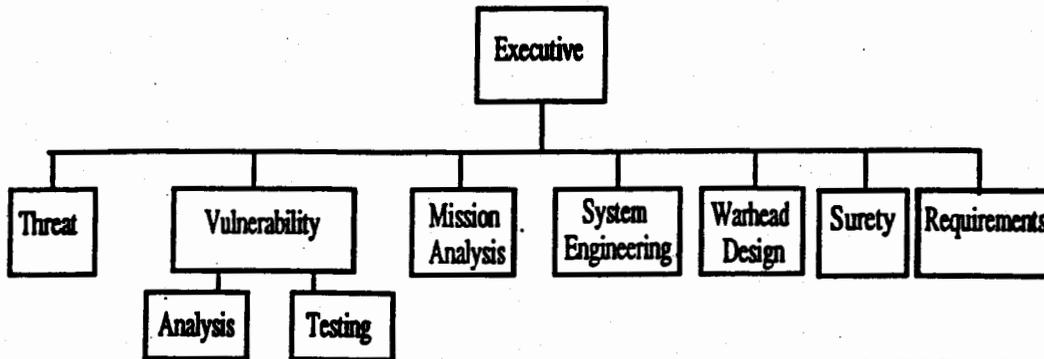
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enough information required from this area that the study would keep the working group. The chairs of each working group were presented with a list of members for each group taken from the attendees. The chair of each working group is presented in table 1. The lists of members are presented in appendix D

Working Group Structure



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Figure 1. (U) Working group structure

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(U) WARHEAD DESIGN INTRO

ASAM Dr Jas Mercer-Smith (LANL) presented his view of the work in the warhead design area. His slides are included in appendix E.

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AMM

The issue that will need to be addressed in the warhead design working group is the certification process of the warhead design. Without an underground test, how will the warhead be certified? This issue will be addressed during the phase 2 study.

(U) SYSTEM ENGINEERING INTRO

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(U) VULNERABILITY INTRO

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Appendix G includes his slides. He reiterated the work completed during phase 1 and how this plays to phase 2. The basic premise of the phase 2 work is to provide quantified vulnerability data to the mission analysis working group (MAWG). He stated the need to address three areas of vulnerability and fill in more data in those three areas when the data become available.

The prediction methods for determining vulnerabilities can then be verified and size of uncertainties reduced.

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Some concerns of the VWG are in post strike assessment and how it will be defined; and how collateral damage will be addressed.

(U) MISSION ANALYSIS INTRO

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(U) Future work will be very involved as it will require interactions between other working groups.

[Redacted]

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(U) SURETY INTRO

(U) The main emphasis will be on the use control and surety themes that are involved in a phase 2 study. The SWG will work closely with system engineering to ensure the missile interface is identified. The further emphasis of the SWG will be in the safety technology area.

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(U) REQUIREMENTS INTRO

[Redacted]

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HPRF phase 2 meeting.

Further information will be provided at the next

(U) THREAT INTRO

[Redacted]

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(U) WORKING GROUP MEETINGS

(U) Before breaking into individual working groups, Capt Lamb provided the breakout of the tasking and in which working group the specific tasking should be addressed. The breakout is provided in table 2. The remainder of the day was spent in working groups determining members, charters, and working group plans. The results of the meetings is contained in appendix I.

Table 2. (U) Specific tasking assignments.

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(U) EXECUTIVE WORKING GROUP

(U) Capt Lamb presented the proposed memberships for the executive working group of the HPRF Phase 2 study. The provide representation from each working group along with representation from each organization involved in the study. Table 3 presents the proposed executive working group members.

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(U) ACTION ITEMS

Table 4. (U) Action items from kickoff meeting.

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NOTE: Numbers 1-10 were not included in this list as they originated from the planning meeting and not from this meeting.

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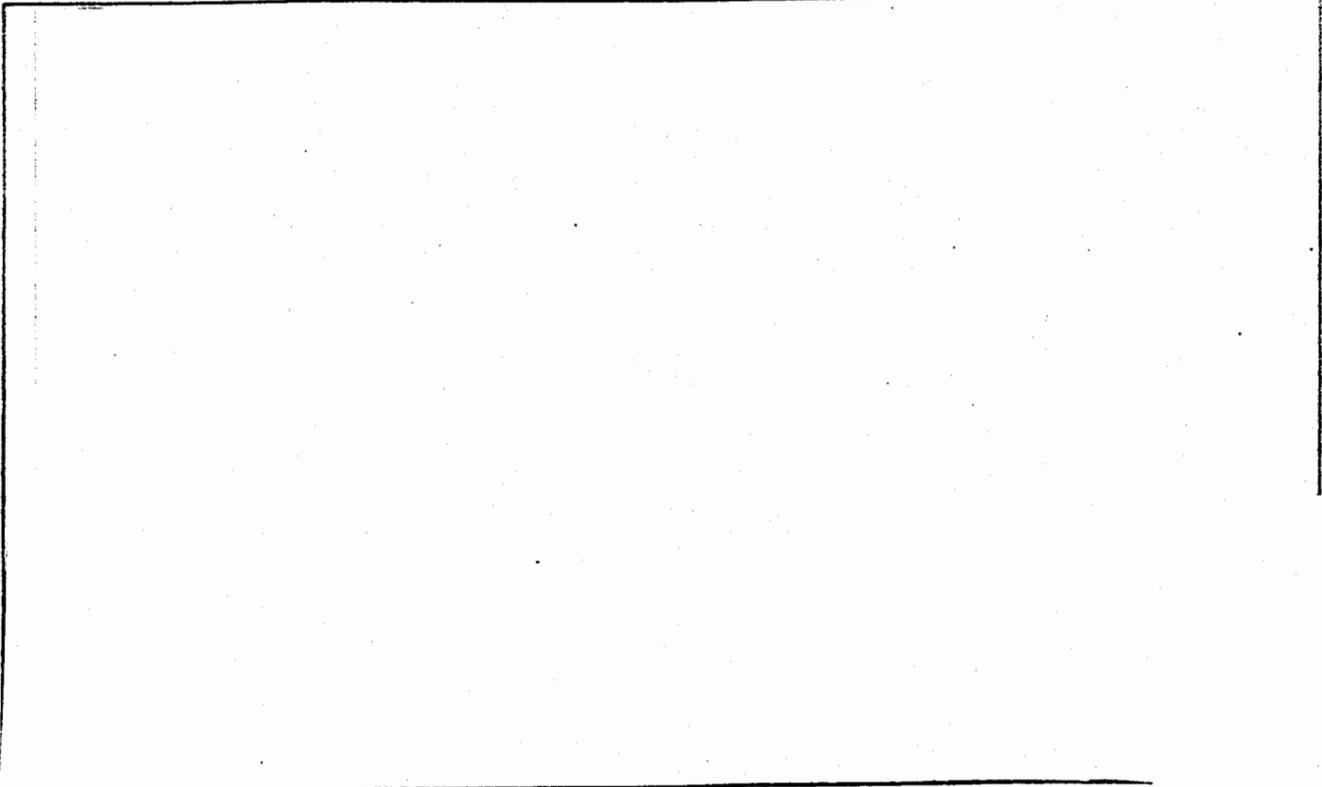
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APPENDIX A
(U) KICKOFF MEETING AGENDA

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Office of Aerospace Studies



Agenda - September 11, 1992

- | | | |
|------|-----------------------------|---------------|
| 0830 | Sign-In | ALL |
| 0845 | Administration | Capt Lamb/OAS |
| 0900 | Working Group Presentations | Chair |
| | - Charters | |
| | - Schedules | |
| | - Memberships | |
| | - Estimated Costs | |
| 1100 | Action Items | ALL |
| 1130 | Summary | Capt Lamb/OAS |

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APPENDIX B

(U) KICKOFF MEETING ATTENDANCE LIST

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10. <u>J. Philip Castillo</u>	<u>Logan RDA</u> <u>Pb Box 9377</u> <u>Albuquerque NM</u> <u>87119</u>	Com: (505) 942 8156 DSN: _____ FTS: _____ FAX: 525-242 4121
11. <u>Michael Blano</u>	<u>LLNL</u> <u>PO Box 808 L-153</u> <u>Livermore CA</u> <u>94550</u>	Com: (570) 422-9882 DSN: _____ FTS: _____ FAX: 510-423-5080
12. <u>DOUG HENSON</u>	<u>SNL 5371</u> <u>Box 969</u> <u>LIVERMORE, CA.</u> <u>94550</u>	Com: (510) 294-2729 DSN: _____ FTS: same FAX: -1015
13. <u>JERRY CUDERBIN</u>	<u>SNL 5161</u> <u>6500 5E20</u> <u>ALBUQUERQUE NM</u> <u>87185</u>	Com: (505) 944 8062 DSN: _____ FTS: 505 944 8063 FAX: _____
14. <u>Ronald W McFee</u>	<u>Los Alamos</u> <u>MS D220</u> <u>Los Alamos, NM</u> <u>87545</u>	Com: (505) 667-1112 DSN: _____ FTS: _____ FAX: _____
15. <u>Ed Whited</u>	<u>Los Alamos</u> <u>MS F602</u> <u>Los Alamos, NM</u> <u>87545</u>	Com: (505) 665-0038 DSN: _____ FTS: 555-0038 FAX: (505) 665-2017 <small>E-mail: whited@seneca.lanl.gov</small>
16. <u>LCDR ED ADE</u>	<u>FCDNA/FCPRW</u> <u>ATTN FCSAC</u> <u>ISRTLAND AFB</u> <u>NEW MEXICO 87115</u>	Com: (505) 846-8575 DSN: 246- FTS: _____ FAX: 846-8611
17. <u>JOHN A. ANDERSEN</u>	<u>SNL 5161</u> <u>132 NMA 87185</u>	Com: (505) 844 0391 DSN: _____ FTS: _____ FAX: _____
18. <u>Charles S. Chow</u>	<u>LLNL</u> <u>E-125</u> <u>Livermore, CA</u>	Com: (570) 422-4639 DSN: _____ FTS: 532-4689 FAX: FTS 532-8185
19. <u>JIM HOGAN</u>	<u>SNL 5371</u> <u>PO BOX 969</u> <u>LIVERMORE CA</u> <u>94550</u>	Com: (510) 294 2853 DSN: _____ FTS: _____ FAX: (510) 294-1015

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Attendance List (cont)

NAME	ORG./ADDRESS (for Classified Mailing)	PHONE #
20. <u>KEN CALAHAN</u>	<u>LANL/AT-9</u> <u>PO Box 1663</u> <u>MAIL STATION 5000</u> <u>LOS ALAMOS NM 87545</u> <u>ATTN: KEN CALAHAN, AT-9, MS H818</u>	Com: <u>(505) 665-4297</u> DSN: _____ FTS: _____ FAX: <u>667-8207 (UNCL)</u>
21. <u>Michael Bernardin</u>	<u>LANL / X-5</u>	Com: <u>(505) 667-1439</u> DSN: _____ FTS: _____ FAX: _____
22. <u>Carolyn Mangens</u>	<u>LANL/NWT</u> <u>Mail St. 5000</u> <u>P.O. Box 1663</u> <u>Los Alamos, 87545</u> <u>ATTN: C Mangens MS F633</u>	Com: <u>(505) 667-3460</u> DSN: _____ FTS: _____ FAX: <u>605-665-4833</u>
23. <u>Lt Col Charles R. Martin</u>	<u>SAF/AQOS(N)</u> <u>Pentagon</u> <u>Washington DC 20330</u>	Com: <u>(703) 693-6303</u> DSN: <u>2263-6303</u> FTS: _____ FAX: <u>(703) 697-7399</u>
24. <u>CPT M.L. Kie Tikang</u>	<u>DWJ HRAIC</u> <u>Joint Technical Staff</u> <u>Alexandria, VA</u> <u>22310</u>	Com: <u>(703) 325-1622</u> DSN: <u>221-1622</u> FTS: _____ FAX: <u>(703) 325-2225</u>
25. <u>Debra K. Johnson</u>	<u>LANL L-13</u> <u>PO Box 500</u> <u>Los Alamos NM</u> <u>87545</u>	Com: <u>(505) 423-7600</u> DSN: _____ FTS: _____ FAX: _____
26. _____	_____	Com: (____) _____ DSN: _____ FTS: _____ FAX: _____
27. _____	_____	Com: (____) _____ DSN: _____ FTS: _____ FAX: _____
28. _____	_____	Com: (____) _____ DSN: _____ FTS: _____ FAX: _____
29. _____	_____	Com: (____) _____ DSN: _____ FTS: _____ FAX: _____

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APPENDIX C

(U) HPRF PHASE 2 TASKING

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DEPARTMENT OF THE AIR FORCE
WASHINGTON DC



OFFICE OF THE ASSISTANT SECRETARY

SAF/AQQ
Pentagon Rm 4E342
Washington DC 20330-1000

AUG 31 1992

MEMORANDUM FOR AFMC/XR

SUBJECT: Phase 2 Warhead Feasibility Study of a Strategic High Power Radio Frequency (HPRF) Weapon (U) - ACTION MEMORANDUM

(U) Request the Office of Aerospace Studies (OAS) initiate and lead for the Air Force a joint DOD/DOE Phase 2 Warhead Feasibility Study to investigate the development of a Strategic High Power Radio Frequency (HPRF) weapon. The Study Group will complete the effort in 30 months. OAS should schedule a kickoff meeting within 30 days. In addition, within 90 days after the kickoff meeting, the Chairman of the Study Group will report to the Nuclear Weapons Council Standing Committee (NWCSC), through SAF/AQQS, on the study goals, strategy, and milestones. In particular, this report should address the plan for validating the lethality methodology.

(S) The NWCSC has approved the Air Force request for this study and asked the DOE to join the study. At the request of the Deputy Assistant Secretary of Defense (Policy), the study will consider possible SLTM delivery of the HPRF weapon. To accomplish this additional goal, the NWCSC has asked the Navy to join the study. We expect that the Navy will have a significant role in the study, and may designate a deputy chairman for the study group. This letter includes the NWCSC letters to DOE and the Navy as attachments.

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DOE,
USAF
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(U) The SAF/AQQ point of contact for this effort is Lt Col Charles R. Martin,
SAF/AQCS, DSN 223-6303 or (703) 693-6303.

Patrick P. Caruana

PAUL F. CARUANA, Major General, USAF
Director of Strategic, SOF, and
Airlift Programs
Assistant Secretary for Acquisition

- 3 Aich
- 1. NWCSC Letter to DOE (SFRD)
- 2. NWCSC Letter to Navy (SFRD)
- 3. Nominal Warhead Parameters (SFRD)

cc: OAS(AFMC)

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DEPARTMENT OF DEFENSE
AND
DEPARTMENT OF ENERGY

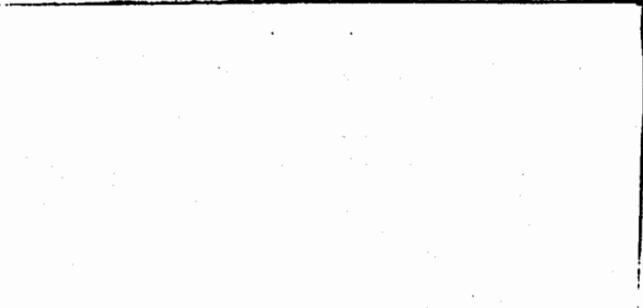


NUCLEAR WEAPONS COUNCIL
STANDING COMMITTEE
WASHINGTON, DC 20301-3050

11 AUG 1992

Rear Admiral W.G. Ellis
Deputy Assistant Secretary
for Military Application
Department of Energy
Washington, DC 20585

Dear Admiral Ellis:



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DOE, USAF,
DTRA

(U) I request the Phase 2 Study Group present its goals, strategy, and milestones to the NWSC within 90 days of initiation of

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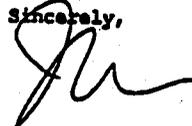
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the Phase 2. In addition, I request the Study Group report at least yearly to the NWCSC on their progress and conclusions.

b(3)

DOE, USAF
DTRA

Sincerely,



John H. Birely
Acting Chairman

Enclosure

cc:
SAF/AQQ
AF/XOO

→ USAF
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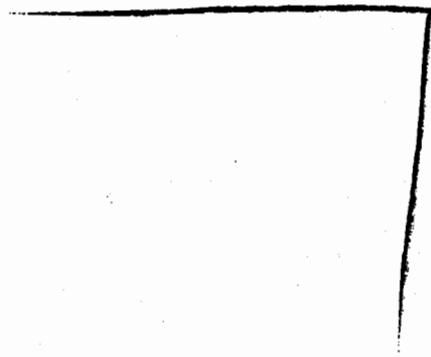
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UN
DEPARTMENT OF DEFENSE
AND
DEPARTMENT OF ENERGY
NUCLEAR WEAPONS COUNCIL
STANDING COMMITTEE
WASHINGTON, DC 20301-3030



11 AUG 1992

MEMORANDUM FOR CHIEF OF NAVAL OPERATIONS

USAF

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SUBJECT: High Power Radio Frequency (HPRF) Weapon Phase 2
Warhead Study

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DOE, USAF
DTRA

(U) For this reason, I request the Navy join the Air Force in the HPRF Phase 2 Feasibility Study so that the study group can investigate both the ICBM and SLBM basing options.

John H. Birely
John H. Birely
Acting Chairman

cc: SAF/ACQ
DAMO

Classified by: CG-W-3, Jan 84

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APPENDIX D
(U) WORKING GROUP MEMBERS

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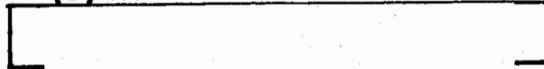
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APPENDIX E

(U) WARHEAD DESIGN INTRO



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September 9, 1992
THIS DOCUMENT CONSISTS OF 7 PAGE(S)
NO. 7 OF 3 COPIES, SERIES A

High Power Radio Frequency Phase 2 Study
Preliminary Kickoff Meeting



Warhead Design Introduction (2)

10 September 1992

USAF
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THERMONUCLEAR APPLICATIONS (X-2)

Los Alamos National Laboratory

DISTRIBUTION:
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Cy. 3A - X-2 (1992CD) Orig. File

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Page -2 -
September 9, 1992

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Phase 1 Study: Warhead Design Issues

The High Power Radio Frequency Phase 1 Study addressed many of the warhead design issues which will be important in the current Phase 2 Study. Notably, in the Phase 1 Study:

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THERMONUCLEAR APPLICATIONS (X-2)

Los Alamos National Laboratory

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September 9, 1992

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Page - 6 -
September 9, 1992

Phase 2 Study: Warhead Design Issues

The High Power Radio Frequency Phase 2 Study Warhead Design Working Group will concentrate on several key weapons issues, including:

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- Weapon certification in the absence of nuclear testing.

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APPLICATIONS (X-2)

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Page -7 -
September 9, 1992

Weapon Certification

- The Warhead Design Working Group will have to develop a methodology for certifying a special-purpose weapon in the absence of nuclear testing.

- Device certification may have a significant impact on the design of the physics package.

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APPENDIX F
(U) SYSTEM ENGINEERING INTRO

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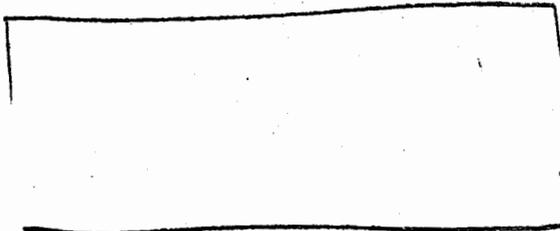
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System Engineering Working Group
Phase I Issues Review

*High Power Radio Frequency
Weapon*



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10 - 11 September 1992
Phillips Lab
Kirtland AFB, NM

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Major SEWG Issues

	Description of Issue	Agency	
I.	General Issues		
A.	Implications of the President's Initiatives	DoD	
B.	Implications of START	DoD	
C.	Human Intent Decision	DoD/DOE	
D.	Build Quantity (force structure issues)	DoD/DOE	
E.	ABM Assumptions	DoD	
F.	New MCs	DoD/DOE	
G.	Delivery Options	DoD	
H.	Other Mission Options	DoD	
II.	Delivery Requirements		
A.	Height of Burst	DOE	DOE 2/3
C.	Range Requirements	DoD/DOE	
D.	Targeting Requirements (w/h integration driver)	DoD	
III.	Warhead Packaging		
A.	External Case Options		
	1. Existing RVs	DoD	
	2. Optimized Case	DoD/DOE	
B.	Nuclear System Options	DOE	
C.	Usage Requirement and Design	DOE/DoD	
D.	Shielding Requirements	DOE	
E.	Degradation Concerns	DOE	
F.	Nuclear Surety		
	1. Enhanced Safety	DoD/DOE	
	2. Use Control	DOE/DOE	DOE 2/3
H.	Warhead Electrical System	DOE	
I.	LLCE	DoD/DOE	
J.	Mechanical & Electrical Interfaces	DoD/DOE	
K.	Maneuvering Capability	DoD/DOE	
IV.	Delivery Platform		
A.	Missile Interface		
	1. Mechanical	DoD/DOE	
	a. Static Loading		
	b. Dynamic Loading		
	c. External Usage Design		

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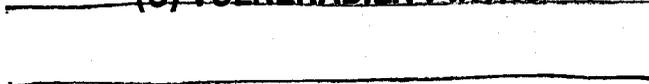
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| | 2. Electrical | DoD/DOE |
| | 3. Software | DoD |
| B. | Impacts of Platform Modifications | DoD |
| | 1. Singlet Conversion | |
| | 2. Mk21/Mk4-5 Conversion | |
| | 3. Guidance Electronics Upgrade (GEU) | |
| | 4. Others | |
| C. | Flight Performance | DoD |
| | 1. Range Capability | DoD |
| | 2. PVB Maneuvering Capability | DoD/DOE |
| | 3. Vehicle Stability | |
| | a. Critical HOB | |
| | b. Critical Vehicle Parameters | |
| | c. Tradeoffs | |

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APPENDIX G

(U) VULNERABILITY INTRO



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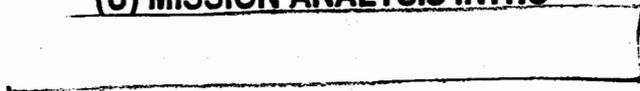
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APPENDIX H

(U) MISSION ANALYSIS INTRO



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MISSION ANALYSIS
INTRODUCTION

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MM

USER INTEREST

- SAC/XR LETTER, 18 APR 90
- SAC TNS, 10 SEP 91
- SAC/XO MESSAGE, JAN 92
- HQ ACC/DO LETTER TO USSTRATCOM J-5
- MNS - TBD

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WHAT WE NEED

- AGREEMENT ON MISSIONS OF INTEREST
- TARGET LIST FOR EACH MISSION
- MEASURE OF EFFECTIVENESS (MOEs)
- MOEs EVALUATION VIA SPECIFIC MODELING

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APPENDIX I
(U) WORKING GROUP PRESENTATIONS

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HPRF Phase 2 VAWG

Technical Objectives

1. **Develop Input Data for Mission Analysis Studies and Future Strategic Planning**
 - **Increase HPRF Effects Database on Specific System Vulnerabilities**
2. **Measure Effectiveness of HPRF Weapons to Cause Damage**
 - **Provide Empirical Data to Labs on Best Weapons Characteristics**
 - **Explore Parametric Variations**
 - **Verify MAWG Analysis Tools by Test & Analysis**
3. **Address Possible Effects on US & Friendly Forces**
4. **Provide Feedback on Possible Methods of Damage Assessment**

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HPRF Phase 2 VAWG

Working Group Structure

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HPRF Phase 2 VAWG

VTSG Questions

- Identify Past Tests
 - Applicability to HPRF Phase 2
 - Sufficiency of Data

- Identify of HPRF Phase 2 Testing
 - Funded
 - Planned but Unfunded
 - Other

- Testing Program Plan (Due in 90 days)
 - Time Schedule
 - Milestones
 - Costs/Funding

HPRF Phase 2 VAWG

VASG Questions

- Review of Target Lists
 - Which Systems are Completed?
 - Which Systems Need Work?

- Analysis Questions
 - Further Refinement of P_E Methodology
 - Further Generic Testing/Validation?

- How Validate MOE Predictions for MAWG?

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HPRF Phase 2 VAWG

Planned Test

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HPRF Phase 2 VAWG

Review Items

- 1. Charter**
- 2. Objectives**
- 3. Structure/Division of Responsibilities**
- 4. Membership/Participants**
- 5. Analysis Activities**
- 6. Test Activities**
- 7. Summary and Action Items**

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CHARTER FOR MISSION ANALYSIS
WORKING GROUP (MAWG)

MAWG ISSUES

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1. Identify Missions
2. Identify Potential Targets
3. Develop Credible Scenarios
4. Determine Measures of Effectiveness (MOEs)
5. Evaluate MOEs Through Modeling
6. Develop Mission Need Statement
7. Determine Post-Strike Assessment Methods with (VAWG)
10. Determine if Damage Expectancy can be used for mission effectiveness with VAWG
11. Identify Appropriate Model and Associated Cost
12. Assist VAWG to Define Test-Bed
13. Test Analysis Should be part of MAWG

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MAWG SCHEDULE

Last Week September Define Missions with USSTRATCOM
First Week October Identify VAWG Test-Bed

MAWG STRUCTURE

Mission Specific Subgroups

Subgroup members would identify targets, develop scenarios, determine MOE and conduct modeling to determine effectiveness.

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SURETY WORKING GROUP-PROPOSED CHARTER

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Charter for the
Warhead Design Working Group (WDWG)

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3	DOE/HQ, DP-251 Attn: Mr Joe Gazda, GTN P.O. Box A Germantown MD 20874	13	USSTRATCOM/J541 Attn: Mr Stan Gooch 901 SAC Blvd Offutt AFB NE 68113-6500
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6	FCDNA/FCPRW Attn: LtCol Walt Atchison Kirtland AFB NM 87115	16	OL-NS/ENN Attn: Ms Denise Fattor Kirtland AFB NM 87117
7	FCDNA/FCPRW Attn: LCDR Ed Ade, FCSAC Kirtland AFB NM 87115	17	USCENTCOM/CCSA Attn: Dr Earl Rubright MacDill AFB FL 33608-7001
8	PL/WSR Attn: Mr Bill Prather Kirtland AFB NM 87117-6008	18	PL/WST Attn: Lt Dave VanVeldhuizen Kirtland AFB NM 87117-6008
9	PL/WSM Attn: Mr William Walton Kirtland AFB NM 87117-6008	19	PL/WST Attn: LtCol Sam Squiller Kirtland AFB NM 87117-6008
10	PL/WSM Bldg 909 Attn: Mr Sam Gutierrez Kirtland AFB NM 87117-6008	20	PL/WSR Attn: Mr Robert Torres Kirtland AFB NM 87117-6008

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22	Sandia National Laboratories Attn: Mr Doug Henson Org 5371 P.O. Box 969 Livermore CA 94550	30	Los Alamos National Laboratory Attn: Dr Ken Calahan, AT-9, MS H818 Mail Station 5000 PO Box 1663 Los Alamos NM 87545
23	Sandia National Laboratories Attn: Dr Kazuo Oishi Org 5161 P.O. Box 588 Albuquerque NM 87185-5800	31	Los Alamos National Laboratory Attn: Dr Mickael Bernardin, X-5 Mail Station 5000 PO Box 1663 Los Alamos NM 87545
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25	Sandia National Laboratories Attn: Dr Dave Fordham Org 4113 P.O. Box 588 Albuquerque NM 87185-5800	33	Los Alamos National Laboratory Attn: Mr Ronald McFee, MS B220 Mail Station 5000 PO Box 1663 Los Alamos NM 87545
26	Sandia National Laboratories Attn: Mr John Anderson Org 5161 P.O. Box 588 Albuquerque NM 87185-5800	34	Lawrence Livermore National Laboratory Attn: Dr Joe Sefcik L-13 P.O. Box 808 Livermore CA 94550
27	Sandia National Laboratories Attn: Dr Jerry Cuderman Org 5161 P.O. Box 588 Albuquerque NM 87185-5800	35	Lawrence Livermore National Laboratory Attn: Dr Hriar Cabayan L-13 P.O. Box 808 Livermore CA 94550
28	Logicon/RDA Attn: Mr Phil Castillo PO Box 9377 Albuquerque NM 87119	36	Lawrence Livermore National Laboratory Attn: Dr Al Kaufman L-85 P.O. Box 808 Livermore CA 94550

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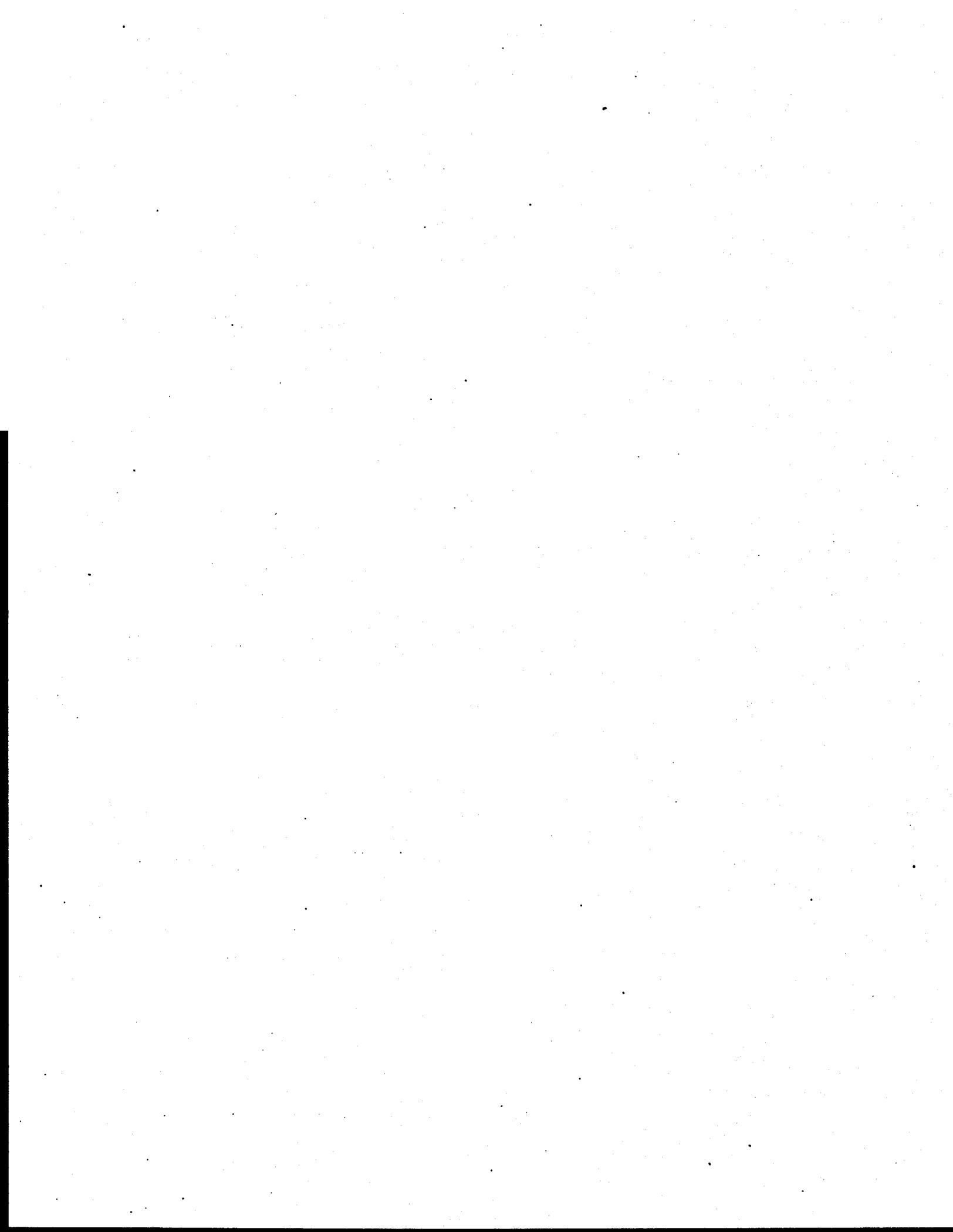
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PO Box 92500
Los Angeles CA 90009

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OFFICE OF AEROSPACE STUDIES (AFMC)

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Kirtland AFB NM 87117-6008

18 November 1992

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TO: Distribution

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W. A. Lamb

WILLIAM A. LAMB, Captain, USAF
Nuclear Weapons Concepts Division
HPRF Phase 2 Study Director

1 Atch
High Power Radio Frequency
(HPRF) Phase 2 Study, Meeting
#2 Minutes (U), OAS-MM-92-12,
13 Nov 92, (S-RD-CNWDI-NF-WN),
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High Power Radio Frequency (HPRF) Phase 2 Study

Meeting #2 Minutes (U)

13 November 1992

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Captain William A Lamb

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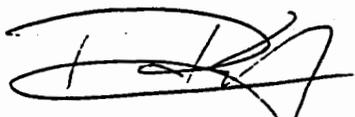
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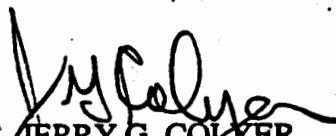


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ROGER F. KROPF, Major, USAF
Chief, Nuclear Weapons Concept Division



JERRY G. COLYER
Technical Director,
Office of Aerospace Studies

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(U) ACKNOWLEDGMENTS

(U) I would like to take this opportunity to thank Mr. Joseph Gazda of Headquarters Department of Energy, who helped me during the second meeting of the HPRF phase 2 Study. His efforts prior to and during the meeting helped immensely and were greatly appreciated.

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(U) INTRODUCTION

(U) The Nuclear Weapons Concept Division of the Office of Aerospace Studies (OAS/XRN) conducted meeting #2 for the High Power Radio Frequency (HPRF) Phase 2 Study on 21 & 22 October 1992. The meeting was held at the Department of Energy (DOE) Headquarters in Germantown, Maryland. The purpose of the meeting was to convene working groups, review working group progress, and update the program status. The individual working groups met during the first day of the meeting, while a general session was held on the second day. The agenda for the meeting is contained in appendix A.

(U) These meeting minutes document meeting #2 and include copies of presentations. Additionally, a list of attendees is provided in appendix B. The meeting highlights are presented in the following paragraphs.

(U) CLASSIFICATION AND SECURITY

~~SECRET~~ The study director, Capt Lamb, presented an overview of the classifications involved in the HPRF Phase 2 Study. Specifically, each individual involved in this study needs to be aware of the proper classification of the materials generated or produced. The classification guides for this study are listed on the front of this report.

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Information provided on the employment of such a device can also carry other caveats such as Not Releasable to Foreign Nationals (NOFORN) and Warning Notice - Intelligence Sources and Methods Involved (WNINTEL). Additionally, information concerning the nuclear design of the HPRF device most likely contains Critical Nuclear Weapon Design Information (CNWDI). It is imperative that all information that is classified be afforded the proper classification security protection. If there is any doubt as to the classification of any information, please take the time to investigate the classification guide or ask the proper knowledgeable individual. A request for information about classified material requires a need-to-know before access to the information can be provided. Make sure you have properly identified an individual's need to know. In regards to unclassified material associated with this program, please handle the information with care. Proper operation security (OPSEC) requires that the unclassified material not be released that can give uncleared individuals the required information to piece together classified information.

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(U) SURETY WORKING GROUP

The presentation slides are included as appendix C. The SWG met with the System Engineering Working Group (SEWG) during this meeting The

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information from both working groups is important to the SWG. The charter for the SWG was reviewed and agreed upon and memberships to the SWG were updated. The results of the HPRF phase 1 study were also reviewed. The SWG plans to develop an evaluation strategy and attend the SEWG and Warhead Design Working Group (WDWG) meetings until a viable candidate system is finalized by the WDWG and SEWG. By attending the other working group meetings, the SWG will have advance information about the design and be able to complete the evaluation work on schedule. A draft of the SWG report is included in the appendix. The action items from the SWG are included in the action item section of this report.

(U) SYSTEM ENGINEERING WORKING GROUP

These inputs are provided as appendix D. As stated in the previous paragraph, the SEWG met with the SWG during the working group session. During the SEWG meeting, working group members reviewed the charter and the memberships, recapped the phase 1 design result, reviewed the nuclear safety theme, and discussed SEWG requirements, including the major issues for their group and interactions with other working groups. The level of Navy participation will have a major impact on the work of the SEWG. The SEWG action items are included in the action item section of this report.

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(U) REQUIREMENTS WORKING GROUP

Her presentation is included as appendix E. Since this was the first meeting of the RWG, they reviewed their charter and memberships. It was noted that some organizations have not identified a representative for the RWG. The group then discussed draft military characteristics (MCs) as they applied to the HPRF Phase 2 Study. The draft MCs are included in appendix E. The HPRF Phase 2 Study also requires a stockpile-to-target (STS) sequence for the final report. The RWG will base their analysis of the STSs on the W78 STS until more information becomes available from the other working groups. The action items from the RWG are included in the action item of this report.

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(U) THREAT WORKING GROUP

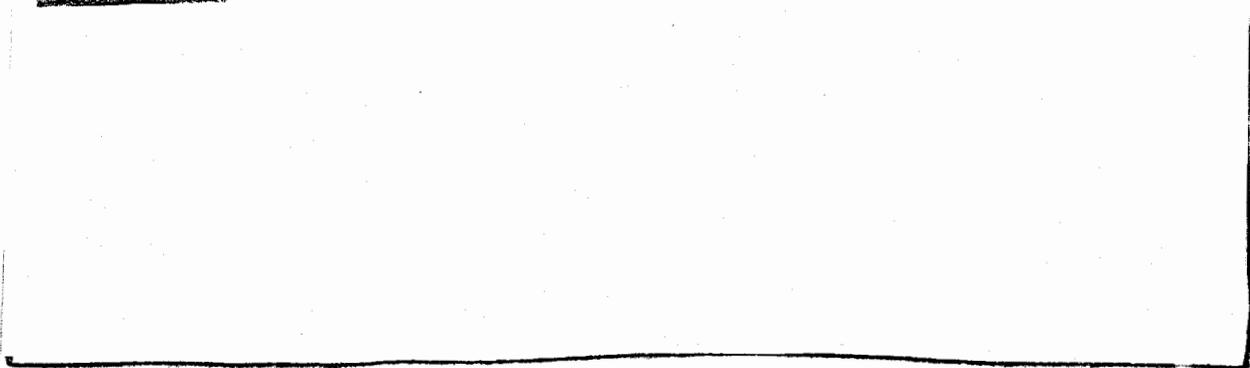
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(U) WARHEAD DESIGN WORKING GROUP

(S/RD) The WDWG met during the working group meeting portion of the meeting, in addition to a meeting held at Los Alamos National Laboratory during the previous week. Dr Joseph Sefcik presented the results of their meetings. His slides are provided in appendix F. Previously, warhead designs were certified with an underground test. With the testing moratorium, the ability to test this warhead configuration may not be available. Therefore, methodology for warhead certification will be the major issue for the working group. The WDWG is addressing this issue with a decision tree methodology that will include quality assurances using calculation predictions from other underground tests. This will certify the output of the device. Additionally, MCs of the HPRF device need to be identified as soon as possible so flexibility's in design can be identified.

(U) MISSION ANALYSIS WORKING GROUP



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(U) VULNERABILITY WORKING GROUP

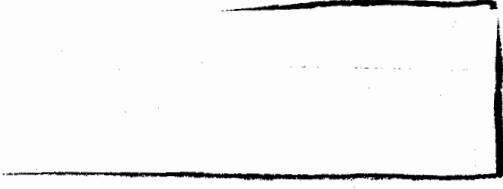
The slides are provided in appendix H. The VWG has continued with meetings to define the targets for the HPRF and to determine the objects to be used for testing and analysis. The present breakdown of testing programs among the organizations is included in the appendix slides. This preliminary list of test objects and organizational responsibilities will be updated as more information becomes available. Further investigations into test objects and the availability of these objects will be done over the next month. An updated test plan will be coordinated with the test directors prior to the next meeting. Each organization involved in the test program will provide the working group chairman with the results of the assigned action items.

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(U) ADDITIONAL PRESENTATIONS



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(U) ELECTRA Program

This program is an evaluation of the methodology to predict an effect on a test object. The first test object results have been generated and are undergoing an analysis to evaluate the predictive capability. Preliminary results show promise and have produced statistically significant data. The data are currently being analyzed. The final data analysis for the test object is scheduled to be reviewed in January. Results should be available during the first quarter of FY95.

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(U) ACTION ITEMS

(U) Table 1 provides the list of action items assigned during meeting #2. The action items assigned during the kickoff meeting are listed in table 2. Figure 1 shows major milestones for the study.

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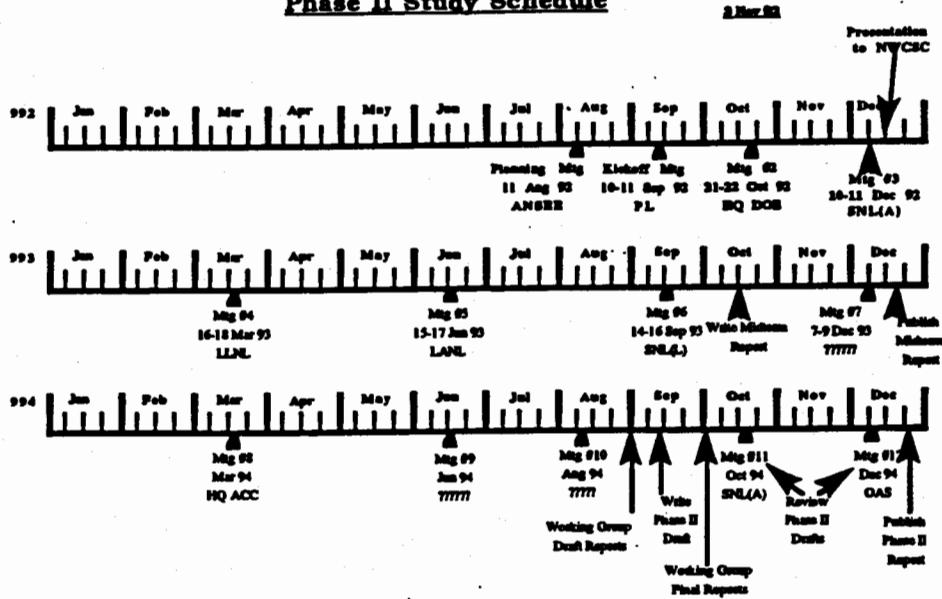
Table 2. (U) Action items from kickoff meeting.

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High Power Radio Frequency Phase II Study Schedule



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Figure 1. (U) HPRF Phase 2 Study Schedule

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APPENDIX A
(U) MEETING #2 AGENDA

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High Power Radio Frequency Phase 2 Study



Agenda - October 22, 1992

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APPENDIX B
(U) MEETING #2 ATTENDANCE LIST

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HPRF Phase 2 Study
Meeting # 2, 21 & 22 October 1992
Attendance List

<u>NAME</u>	<u>ORG./ADDRESS</u> (for Classified Mailing)	<u>PHONE #</u>
1. <u>WILLIAM LAMB</u>	<u>DAS/XRM</u> <u>2350 MAXWELL ST</u> <u>KIRTLAND AFB, NM</u> <u>87117-6008</u>	Com: <u>(505) 846-8233</u> DSN: _____ FTS: _____ FAX: <u>505 846-6668</u>
2. <u>CHARLES MO</u>	<u>LRDA</u> <u>6053 W. Century Blvd</u> <u>Los Angeles, CA</u> <u>90009</u>	Com: <u>(310) 645-1122</u> DSN: _____ FTS: _____ FAX: _____
3. <u>CDR Tom Walker</u>	<u>Field Command Defense Nuclear</u> <u>Agency (FCDA)</u> <u>Kirtland Air Force Base, NM</u> <u>87117-5000</u>	Com: <u>(505) 846-8883/45</u> DSN: <u>246</u> FTS: _____ FAX: <u>(505) 846-4244</u>
4. <u>CPT Mark Weitekamp</u>	<u>HQDNA/RAEE</u> <u>16801 Telegraph Rd</u> <u>Alexandria, VA</u> <u>22310-3558</u>	Com: <u>(703) 325-16122</u> DSN: <u>221-61022</u> FTS: _____ FAX: <u>X 2959</u>
5. <u>4 Col WALT ATKINSON</u>	<u>FCDNA/FCRA</u> <u>Kirtland AFB, NM</u> <u>87117-5000</u>	Com: <u>(505) 846-9584</u> DSN: <u>246-9584</u> FTS: _____ FAX: <u>846-9611</u>
6. <u>Capt Chris Powell</u>	<u>HQ ACC / DONM</u> <u>205 Dodd Blvd Site 101</u> <u>Langley AFB VA 23065</u>	Com: <u>(804) 764-6411</u> DSN: <u>574-6411</u> FTS: _____ FAX: <u>574-2088</u>
7. <u>Michael Bernardin</u>	<u>Los Alamos Nat'l Lab</u> <u>P.O. Box 1663 MS 8259</u> <u>Los Alamos, NM 87545</u>	Com: <u>(505) 667-1439</u> DSN: _____ FTS: _____ FAX: _____
8. <u>James R Hogan</u>	<u>SANDIA NSR LABS</u> <u>DEPT 5871</u> <u>LIVERMORE CA 94550</u> <u>PO Box 969</u>	Com: <u>(510) 294-2853</u> DSN: _____ FTS: _____ FAX: <u>(510) 294-1015</u>
9. <u>Deborah Wojtowicz</u>	<u>Lawrence Livermore Nat'l Lab</u> <u>PO Box 808 L-13</u> <u>Livermore CA 94550</u>	Com: <u>(510) 423-9000</u> DSN: _____ FTS: _____ FAX: _____

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NAME	ORG./ADDRESS (for Classified Mailing)	PHONE #
10. <u>JOSEPH A. SEPUK</u>	<u>LAWRENCE LIVERMORE</u> <u>NATIONAL LABORATORY</u> <u>P.O. BOX 808 LIVERMORE</u> <u>CA. 94550 L-13</u>	Com: <u>(510) 4230671</u> DSN: _____ FTS: _____ FAX: <u>(510) 4230925</u>
11. <u>PHILIP ANGELOTTI</u>	<u>CDR USARMY AIRMANCO</u> <u>Research Development & Engineering</u> <u>Center</u> <u>ATTN: SMCAR-FSS-E</u> <u>PICATINNY AIRFIELD NJ 07806-5000</u>	Com: <u>(201) 724 5451</u> DSN: <u>880 5451</u> FAX: <u>STATE 201-724-5451</u> <u>201-724-2996</u>
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13. <u>JOHN A. ANDERSON</u>	<u>SLN Dept 5161</u> <u>Box 5800</u> <u>ABW NM 87105</u>	Com: <u>(505) 844 0391</u> DSN: <u>244 0391</u> FTS: <u>505 844 0391</u> FAX: <u>844 8745</u>
14. <u>Hriau (Cubana)</u>	<u>LLNL</u> <u>Box 808, L86</u> <u>Livermore CA</u> <u>94550</u>	Com: <u>(510) 422-8871</u> DSN: _____ FTS: <u>532-8871</u> FAX: <u>510-422-5576</u>
15. <u>Marlin E. Morris</u>	<u>Sandia Nat. Labs</u> <u>Dept 2753</u> <u>P.O. Box 5800</u> <u>Albuquerque, NM 87185-5800</u>	Com: <u>(505) 845-8447</u> DSN: _____ FTS: <u>505-845-8447</u> FAX: <u>505-844-7057</u>
16. <u>Kenneth C Chen</u>	<u>Sandia Nat Labs</u> <u>Dept. 2753</u> <u>P.O. Box 5800</u> <u>Albuq NM 87185-5800</u>	Com: <u>(505) 844-8133</u> DSN: _____ FTS: _____ FAX: <u>(505) 844-7857</u>
17. <u>SAM GUTIERREZ</u>	<u>PHILLIPS LABORATORY</u> <u>PL/WSM</u> <u>KIRTLAND AFB NM</u> <u>87117-6008</u>	Com: <u>(505) 896-4823</u> DSN: <u>246-4823</u> FTS: _____ FAX: <u>505 896-7836</u>
18. <u>MICHAEL BLANO</u>	<u>LLNL</u> <u>P.O. Box 808 L-153</u> <u>LIVERMORE CA</u> <u>94550</u>	Com: <u>(510) 422-9882</u> DSN: _____ FTS: <u>8 532-9882</u> FAX: <u>510-423-5080</u>
19. <u>ARMEN E MARDIGUIAN</u>	<u>SAF/AQCS</u> <u>PENTAGON</u> <u>WASHINGTON DC</u> <u>20330-1000</u>	Com: <u>(703) 693-6303</u> DSN: <u>223-6303</u> FTS: _____ FAX: <u>703-697-7399</u>

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20. <u>WILLIAM J. TEDESCHI</u>	<u>SANDIA NAT'L LABS</u> <u>ORG. 5161</u> <u>P.O. BOX 5800</u> <u>ALBUQUERQUE, NM 87185</u>	Com: <u>(505) 845-9851</u> DSN: <u>245-9857</u> FTS: <u>505 845-9857</u> FAX: <u>(505) 844-8745</u>
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22. <u>David M. Fordham</u>	<u>Sandia National Labs</u> <u>Org 4113</u> <u>PO Box 5800</u> <u>Albuquerque, NM 87122</u>	Com: <u>(505) 844-9969</u> DSN: <u>244</u> FTS: _____ FAX: <u>(505) 844-2293</u>
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24. <u>James F. Solberg</u>	<u>Sandia Nat'l Labs</u> <u>Org. 2753</u> <u>P.O. Box 5800</u> <u>Albuq, N.M. 87185</u>	Com: <u>(505) 844-1135</u> DSN: <u>244</u> FTS: _____ FAX: <u>505-844-1857</u>
25. <u>DONALD HUIE</u>	<u>U.S. ARMY ARDEC</u> <u>SMCAR-FSN-N B354</u> <u>PICATINNY ARSENAL, NJ</u> <u>07806-5000</u>	Com: <u>(201) 724-2720</u> DSN: <u>880-2720</u> FTS: _____ FAX: <u>201-724-5461</u>
26. <u>Ed Whitted</u>	<u>LANL / A-5</u> <u>P.O. Box 5000 / MS 66L</u> <u>Los Alamos, NM</u> <u>87545-5000</u>	Com: <u>(505) 665-0038</u> DSN: _____ FTS: <u>855-0038</u> FAX: <u>(505) 665-2017</u> ; FTS: 855-0038
10/21 & 10/22 27. <u>Mike Haertling</u>	<u>LANL / WX-1</u> <u>P.O. Box 5000 / MS C936</u> <u>Los Alamos, NM 87545</u>	Com: <u>(505) 667-0592</u> DSN: _____ FTS: <u>N/A</u> FAX: <u>(505) 667-1878 (UNCL. ONLY)</u>
28. <u>Lyle Edwards</u>	<u>LANL / WX-1</u> <u>P.O. Box 5000 / MSC 936</u> <u>Los Alamos, NM</u> <u>87545</u>	Com: <u>(505) 667-6472</u> DSN: _____ FTS: _____ FAX: <u>(505) 667-1878</u>
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34. <u>Denise FATOR</u>	<u>OL-NS/ENVI</u> <u>1651 1st St SE</u> <u>Kirtland AFB NM</u> <u>87117-5617</u>	Com: <u>(505) 846-6767</u> DSN: <u>246-6767</u> FTS: <u>846-6767</u> FAX: <u>(505) 846-4620</u>
35. <u>Joe GAZDA</u>	<u>U.S Dept of Energy</u> <u>DP251, GTN</u> <u>P.O. Box A</u> <u>Germantown, MA 20374</u>	Com: <u>(301) 903-2984</u> DSN: _____ FTS: _____ FAX: <u>301 903-5658</u>
36. <u>CLIFF DE JURE</u>	<u>KAMM SCIENTIS</u> <u>PO Box 7163</u> <u>Com Spr. Co</u> <u>80333-7463</u>	Com: <u>(714) 591-1432</u> DSN: _____ FTS: _____ FAX: <u>(714) 591-1432</u>
37. <u>Charles R. Martin</u>	<u>SAF/AGRS</u> <u>Pentagon</u> <u>Washington DC</u> <u>20330</u>	Com: <u>(703) 693 6303</u> DSN: <u>223 6303</u> FTS: _____ FAX: <u>703 6977 399</u>
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39. <u>BILL STEINKAMP</u>	<u>DOE-HQ DP-251</u> <u>GTN P.O. Box A</u> <u>GERMANTOWN, MD 20672</u>	Com: <u>(301) 903-2988</u> DSN: _____ FTS: _____ FAX: <u>301-903-5658</u>

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41. <u>CLIFF DEJONIS</u>	<u>KANAW SCIENCES</u> <u>PO Box 7463</u> <u>COLUMBIA CO 80177</u>	Com: <u>(719) 511-</u> DSN: <u>-</u> FTS: <u>-</u> FAX: <u>-</u>
42. <u>Don Shover</u>	<u>TGW</u> <u>Dis Box 1310</u> <u>5701 BETHLEHEM CA</u> <u>92450</u>	Com: <u>(714) 352-6461</u> DSN: <u>570-6461</u> FTS: <u>-</u> FAX: <u>714-352-2857</u>

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APPENDIX C

(U) SURETY WORKING GROUP

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Surety Working Group Meeting Summary--Oct 21, 1992

The Surety Working Group (SWG) met jointly with the Systems Engineering Working Group and plans to continue doing so until systems and warhead designs are sufficiently defined that meaningful evaluation of the candidates can begin. During the Surety part of the Oct 21 meeting, the group charter was reviewed and the membership updated. The results of the HPRF Phase 1 surety study were reviewed, and possible approaches to the Phase 2 surety evaluation discussed. The present status is that several Phase 1 candidates have been proposed and evaluated by the Phase 1 Surety Working Group. Until new developments from the Systems Engineering and Warhead Design Working Groups are provided, the most productive SWG activity appears to be to develop an evaluation strategy and to attend SEWG and WDWG meetings as background for subsequent SWG efforts. Viewgraphs and handouts from the SWG meeting, including Action Items are attached. Requests for inputs from other working groups are included in the Action Items.

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AGENDA
SURETY WORKING GROUP MEETING
DOE/HQ
10-21-92

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PROPOSED SURETY WORKING GROUP APPROACH

- (1) Warhead Candidates not likely to be well defined for months.

- (2) Meanwhile Propose
 - SWG Members attend both System Engineering & Warhead Design working groups to understand candidates & their evolution
 - SWG determines evaluation approach - i.e., PRA, QFD, Other for evaluating Surety (safety, use control, security)

ACTION ITEMS

REQUEST	RESPONSIBLE PERSON/GROUP
• MC's and STS's	RWG
• SURETY THEMES	WDWG SEWG
• DASMA PHASE 1's USE CONTROL THEMES	CUDERMAN
• SWG INPUTS FOR 90 DAY REVIEW - SCHEDULE & MAJOR MILESTONES	CUDERMAN

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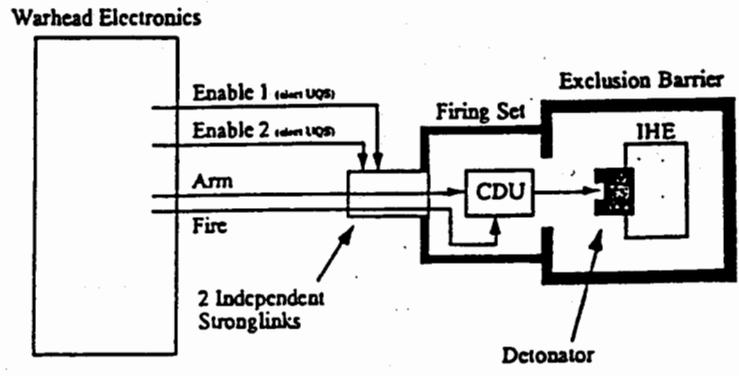
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Figure 11.C-2. Exclusion Region Concept

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APPENDIX D

(U) SYSTEM ENGINEERING WORKING GROUP

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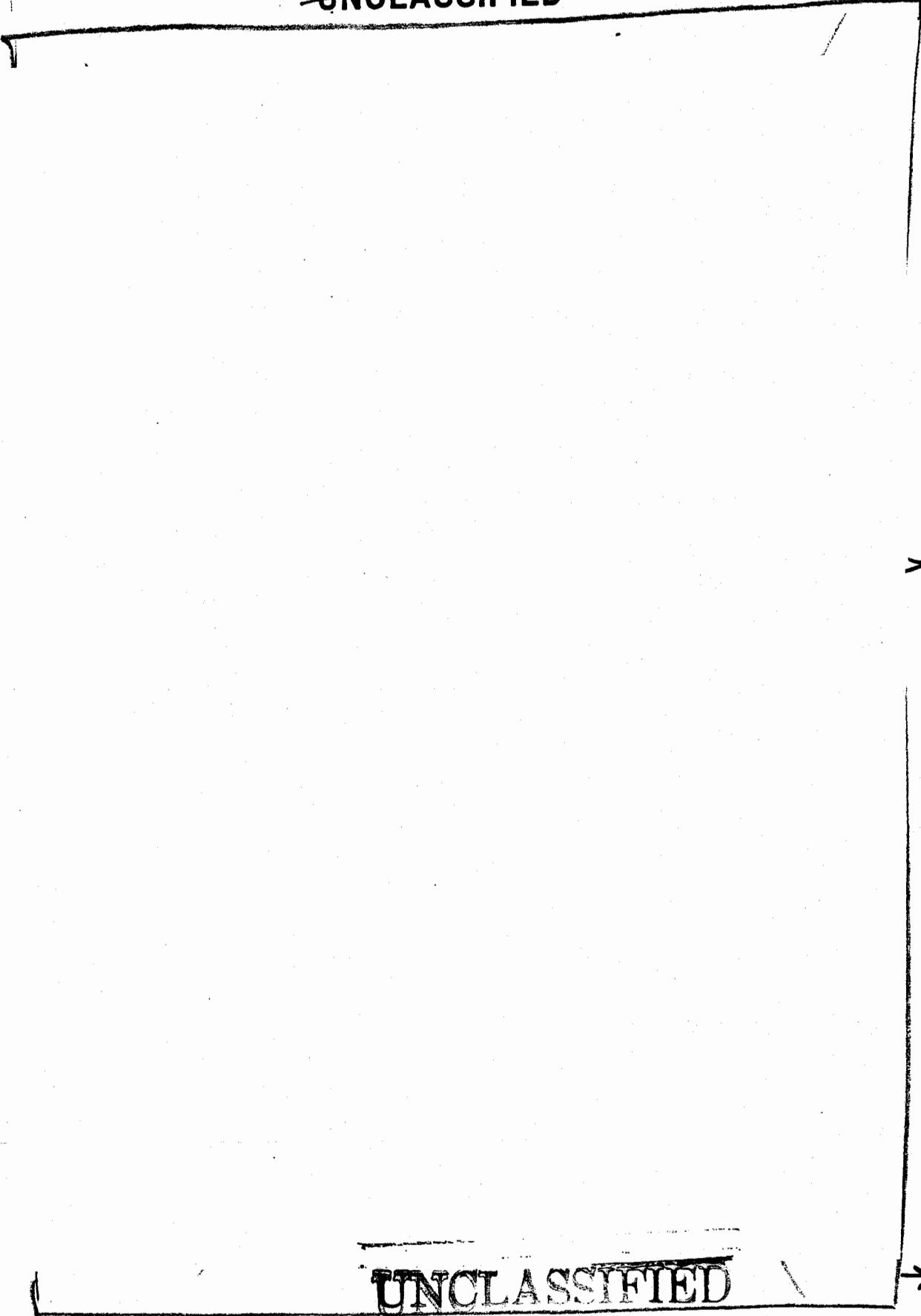
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APPENDIX E

(U) REQUIREMENTS WORKING GROUP

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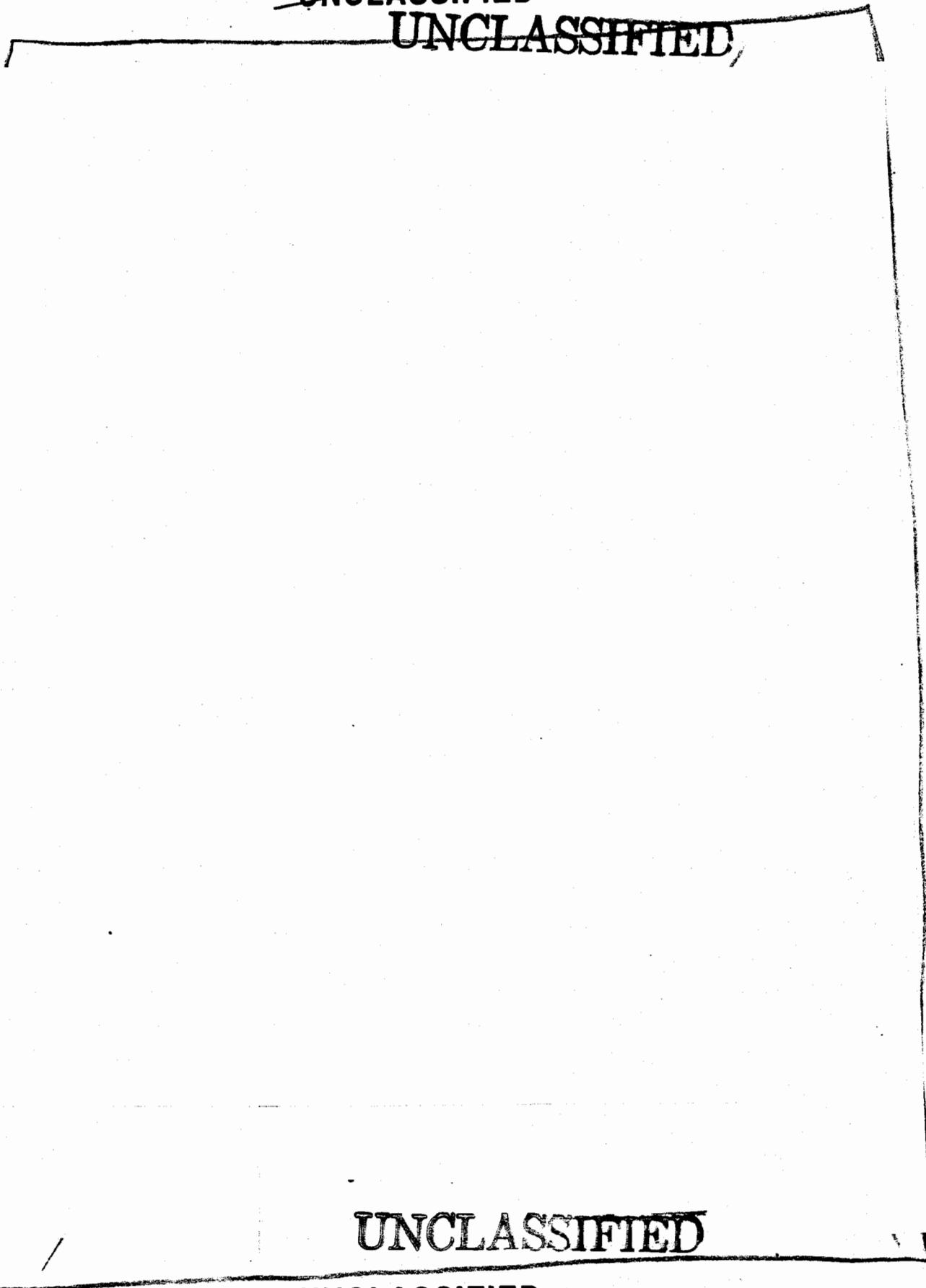
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APPENDIX F

(U) WARHEAD DESIGN WORKING GROUP

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- PRIMARY DESIGN ISSUES WILL DEPEND ON THE STATUS OF THE MORATORIUM AND REQUIREMENTS FOR IHE AND FRP

- CERTIFICATION WILL FOCUS ON THE OUTPUT OF THE DEVICE

 - OUTPUT LEVELS WILL BE SPECIFIED

- NEED MC AND STS TO BEGIN DESIGN

 - IDENTIFY FLEXIBILITY IN MC

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APPENDIX G

(U) MISSION ANALYSIS WORKING GROUP

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(U) VULNERABILITY WORKING GROUP

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HPRF Phase 2 VAWG

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HPRF PHASE 2 TEST PROGRAMS

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**HPRF Phase 2 VAWG
Sign Up Sheet**

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