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MINUTES

HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING 95-1 (#12)

31 JANUARY - 1 FEBRUARY 1995

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING 95-1 (#12)

31 JANUARY - 1 FEBRUARY 1995

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2. (U) **EWG Meeting Objective.** The objective was to discuss all options available on the study at this time and reach consensus on which option to pursue and the approach to be taken. The most probable option is to complete the study as planned and draw on the group's expertise to make the appropriate recommendations.

II. (U) DISCUSSION TOPICS.

A. (U) Program Update. Mr Baird reviewed the study's schedule/milestones and specific questions that need to be answered as a result of the study (Appendix E).

1. (U) Schedule/Milestones. Some study milestones and final report input dates (Appendix E) have slipped since the last meeting. An EWG meeting is planned for 22 March 1995 at the United States Strategic Command (USSTRATCOM) to discuss study conclusions and recommendations. The EWG members will review the final report in April/May 1995, and the final report will be published and distributed in June 1995. Briefings to various organizations will follow the final report distribution in July 1995.

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B. (U) Security Classification Guidance. Mr Bill Plummer, Sandia National Laboratories (SNL) provided information associated with the HPRF security classification guidance (Appendix F). The draft HPRF classification guide is included in Appendix F to support Working Group Chairmen in classifying their final report inputs. Since the HPRF Classification Guide will not be finalized in time to use in the study's final report, report inputs should be classified at the highest level based on approved referenced guides. Section V of the HPRF Classification Guide, previously presented at the meeting in Colorado Springs on 22 September 1994 and in the minutes of that meeting on

page 40, has been updated and is shown in Appendix F along with the previous version for comparison purposes. Classifiers should be sure to use the high classification.

C. (U) Surety Working Group Final Report.

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presented a summary of the SWG's final report (Appendix G). The SWG used a Quality Function Deployment (QFD) approach to evaluate surety of HPRF warhead candidates in the areas of nuclear detonation safety, operational safety, nuclear material dispersal and use control. QFD is a relatively new methodology as applied to Phase 1 and Phase 2 studies. As the study proceeded, candidate designs changed in accordance with the QFD evaluation measures. To the extent that the design changes were valid, the ongoing QFD evaluation positively contributed to developing better candidate designs.

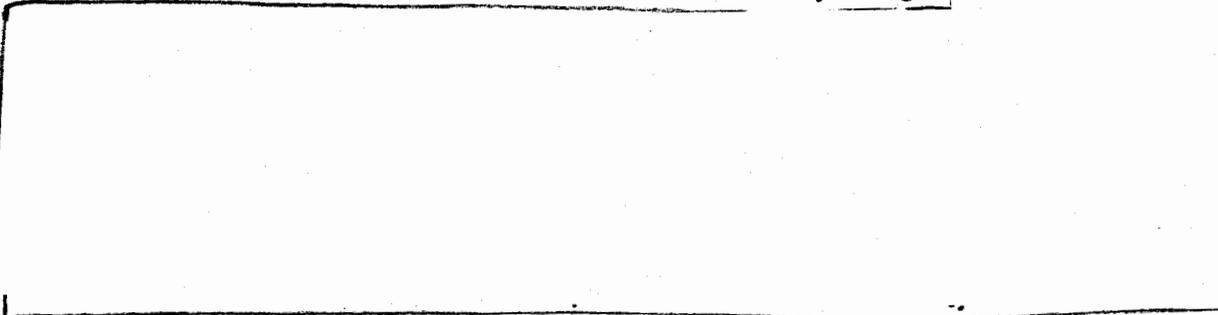
1. (U) Nuclear Detonation Safety. The six HPRF safety themes fall into three general groups.

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The remaining three candidates, which use the most modern safety enhancements, scored the highest by implementing safety technology that addresses known safety soft spots in the stockpile.

2. ~~by~~ Operational Safety. Results of the operational safety QFD evaluation revealed desirable features which could enhance candidate safety design.

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featuring the latest ENDS technology scored the highest.

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There was no significant difference with the candidates in use control.

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1. (U) **Military Characteristics.** The MCs state the performance requirements and physical characteristics for those parts of the HPRF warhead that are the sole responsibility of the DOE to design, develop, certify, and produce. The draft MCs were written to ensure unresolved issues get addressed during Phase 2A of the program. The draft MCs were written in a two-column format. The left-hand column contains the MC requirement and the right-hand column documents any remarks/comments associated with the MC requirement. The purpose for this format is to ensure MC concerns and/or issues identified during Phase 2 are fully documented.

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2. (U) **Unique Issues.** The HPRF Phase 2 Study has shown there are issues unique to the HPRF warhead when compared with other warheads. In writing the MCs and STS, it became apparent to the Study Director and RWG that these issues needed to be documented during Phase 2 for review in Phase 2A of the program.

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It was decided at this meeting to have the MAWG cover the MOE issues in their final report, since the MOEs specifically apply to the four mission areas.

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3. (U) Stockpile-to-Target Sequence. The STS document provides the DOE and the Air Force with requirements, design goals, and supplemental data which amplify the MCs by providing additional detailed information necessary for development of the HPRF warhead.

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The STS provides the description of the logistics, employment concepts, and associated environments the HPRF warhead has to live with. The environmental requirements reflect the most current environmental threat data until better information becomes available.

E. ~~AW~~ Systems Engineering Working Group Final Report.

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1. ~~SECRET~~ Use Control. There are technical options up to CAT F PAL in the various warhead candidates but many issues need further study. There is currently no consensus on the definition of CAT F PAL comparable system. Assumptions regarding existence of the Minuteman III Guidance Replacement Program (GRP) are critical.

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the greater the impact on the existing Minuteman III communication system. If the GRP is implemented, however, the existing power delivery and communication system can be used. The use control data and safety intent signals can piggyback on the GRP hardware. The SEWG recommends a joint DoD/DOE study on use control for the Minuteman III system.

2. (U)

Solutions satisfying the physics requirements discussed earlier are technically feasible.

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3. (U) Warhead Packaging.

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4. (U) Missile Integration.

The payload support deck design must

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be reviewed. The warhead to missile interface is critical in implementing use control and nuclear safety.

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5. ~~Now~~ Flight Performance. The flight performance results are based on calculations not flight tests.

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6. (U) Nuclear Safety. The goal for nuclear safety was to propose designs with ENDS, IHE and FRP technology.

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7. (U) Other Issues.

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The question of flight testing needs further exploration but could be performed if required.

F. (U) Warhead Design Working Group Final Report.

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and Dr Michael Bernardin, LANL, presented results of the high level vulnerability test program and conclusions of the New Mexico design team candidates (Appendix J). The California design team portion of the final report was not presented, since it was presented at a previous meeting.

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1. ~~AWW~~ New Mexico Candidates Output. The New Mexico design team concentrated on four design candidates during the study.

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2. ~~AWW~~ Vulnerability Test Program Results.

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Details of the test results and limitations will be included in the final report. Also, included will be a statement on "first shot" effects and repeatability of results.

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2. ~~AAZ~~ [Redacted]

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Preliminary results are presented in paragraph II.H.1 of these minutes. Findings and conclusions are currently pending.

3. ~~AAZ~~

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[Redacted] Results describe tests of possible fault mechanisms and suggests likely thresholds. Conclusions of the assessment are presented in paragraph II.H.2 of these minutes.

4. ~~AAZ~~

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The Level of effort has not been as high as other mission areas throughout the study. Preliminary results are presented in paragraph II.H.3 of these minutes. Findings and conclusions are currently pending.

H. ~~AAZ~~ Mission Analysis Working Group Final Report. [Redacted]

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This study can not demonstrate a difference in overall kills

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I. (U) Executive Working Group Session. Mr Baird, NWI, led a discussion of study conclusions and recommendations with the EWG members. It was agreed that the Working Group Chairmen would provide conclusions and recommendations including any follow-on activities of their study areas to the Study Director by 15 February 1995. The Study Director will distribute the conclusions/recommendations to the EWG members for their review prior to the next EWG meeting on 22 March 1995 at USSTRATCOM. An initial list of working group conclusions and recommendations is provided below.

1. (U) SWG Conclusions/Recommendations.

- a. (U) Safety evaluation of all warhead candidates was completed.
- b. (U) Use control needs study for strategic systems (existing and new systems).

2. (U) SEWG Conclusions/Recommendations.

- a. (U) Technical options for system integration have been identified.
- b. (U) Trade-offs are required to achieve optimum point design.

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action item is closed.

(U) 94-3-1. Assigned to EWG Membership. Review and provide comments/additions on accuracy and completeness of draft HPRF Security Classification Guide to HPRF Study Director. A subgroup made up of SNL, LANL, LLNL, NWI and FCDNA has been formed to review guide. Mr Bill Plummer, SNL (NM), provided information on HPRF security classification guidance. This action item is closed.

(U) 94-4-1. Assigned to Working Group Chairmen. Identify all documentation that supports working group inputs to include that published as part of the study as well as that referenced in either the final report or supporting reports. This information is being provided with the final report inputs. This action item is closed.

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(U) 94-4-2. Assigned to LANL, Dr Calahan

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In mid-December 1994 only part of system was in country. USSTRATCOM says rest of system is now in country. Defense Intelligence Agency says system has been tested. Suspense: 28 February 1995.

(U) 94-4-3. Assigned to LANL, Dr Calahan. Visit study test agencies to obtain appropriate sets of transfer functions for each test item for use in candidate optimization evaluation. Transfer functions have been obtained on all test items except for one set of transfer functions at the Phillips Laboratory. Suspense: 7 February 1995.

(U) 94-4-4. Assigned to LANL, Dr Bernardin. Prepare quantitative results of candidate performance using each candidates output and transfer functions from action

item 94-4-3 to determine candidate performance. If the transfer functions are provided on 7 February 1995, then the quantitative results will be completed on 15 February 1995.
Suspense: 15 February 1995.

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This action item is closed.

IV. (U) NEXT MEETING. There will be an HPRF Phase 2 Study EWG Meeting on 22 March 1995 at USSTRATCOM to discuss overall study conclusions and recommendations.

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**APPENDIX B
LIST OF ATTENDEES.**

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HPRF Mtg 95-1 Attendance: 31 JANUARY 1995 @ DOE/AL

| Agency | Rank | First Name | Last Name | DSN | Phone # | FAX # | City or Base | ST | ZIP Code |
|----------------------------|-------|------------|------------|-------|----------|----------|-----------------|----|------------|
| Dept of Defense | | | | | | | | | |
| USSTRATCOM/J533 | Mr | Stan | Gooch | 271-5 | 294-5254 | 294-6148 | Offutt AFB | NE | 68113-6500 |
| USSTRATCOM/J5231 | Maj | Steven | Langer | 271-5 | 294-8304 | 294-1323 | Offutt AFB | NE | 68113-6500 |
| FCDNA/FCPR | LtCol | Mark | Cranfill | 246 | 846-8584 | 846-8611 | Kirtland AFB | NM | 87117-5616 |
| FCDNA/FCPRA | Capt | Skip | Langbehn | 246-5 | 846-8584 | 846-8611 | Kirtland AFB | NM | 87117-5616 |
| US AIR FORCE | | | | | | | | | |
| SAF/AQOS(N) | LtCol | Billy W. | Mullins | 223-5 | 693-6303 | 695-0220 | Washington | DC | 20330-1060 |
| HQ AFSPC/DOXN | Capt | Kirk | Dickenson | 692-5 | 554-3776 | 554-5079 | Peterson AFB | CO | 80914-4120 |
| HQ AFSPC/DOXN | Maj | John T. | Valverde | 692-5 | 554-5995 | 554-5079 | Peterson AFB | CO | 80914-4120 |
| SA-ALC/NWIW | Mr | Keith | Baird | 246-5 | 846-6767 | 846-4620 | Kirtland AFB | NM | 87117-5617 |
| SA-ALC/NWIW | Mr | Frank | Carrillo | 246-5 | 846-6767 | 846-2038 | Kirtland AFB | NM | 87117-5617 |
| US ARMY | | | | | | | | | |
| US ARMY ARDEC | Mr | Philip | Angelotti | 880-5 | 724-5451 | 724-2375 | Picatinny Arsnl | NJ | 07806-5000 |
| US NAVY | | | | | | | | | |
| Dept of Navy, SSPO | Mr | Richard | Hess | | 742-4929 | 743-0072 | Sunnyvale | CA | 94088-3504 |
| Dept of Energy | | | | | | | | | |
| DOE/HQ, DP-12 | Dr | Alvin | Baker | | 903-8455 | 903-5658 | Germantown | MD | 20874-5000 |
| DOE/AL-WPD | Mr | Dennis | Umshler | | 845-4740 | 845-6459 | Albuquerque | NM | 87185-5400 |
| Los Alamos Nat Labs | | | | | | | | | |
| LANL/X-5 | Dr | Michael | Bernardin | | 667-1439 | 665-7725 | Los Alamos | NM | 87545-2345 |
| LANL | Mr | Troy | Eddleman | | 667-6811 | | Los Alamos | NM | 87544 |
| LANL | Mr | John | Hutchinson | | 665-3665 | 665-2017 | Los Alamos | NM | 87545-2345 |
| LANL | Dr | Ronald | McFee | | 667-1682 | 665-2227 | Los Alamos | NM | 87545-2345 |
| LANL/NWT | Mr | Thomas | Scheber | | 665-0045 | 665-2213 | Los Alamos | NM | 87545-2345 |
| LANL | Mr | Ed | Whitted | | 665-0038 | 665-2017 | Los Alamos | NM | 87545-5000 |
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HPRF Mtg 95-1 Attendance 31 JANUARY 1995 @ DOE/AL

| Agency | Rank | First Name | Last Name | DSN | Phone # | FAX # | City or Base | ST | ZIP Code |
|---------------------------|------|------------|------------|------|----------|----------|--------------|----|------------|
| Livermore Nat Labs | | | | | | | | | |
| LLNL/L-153 | Dr | Mike | Ong | | 422-0206 | 423-5080 | Livermore | CA | 94550-0808 |
| LLNL | Mr | Steven | Patonacure | | 422-6698 | 423-5864 | Livermore | CA | 94551-0808 |
| LLNL/L-13 | Dr | Joe | Sefcik | | 423-0671 | 423-0925 | Livermore | CA | 94550-0808 |
| LLNL | Dr | D. Lynn | Shaeffer | | 422-2092 | 423-5804 | Livermore | CA | 94550-0808 |
| Sandia Labs (NM) | | | | | | | | | |
| SNL(NM) | Mr | Jerry | Adams | | 844-3662 | 844-2189 | Albuquerque | NM | 87185-0482 |
| SNL(NM) | Dr | Roger | Breeding | | 844-1532 | 844-8867 | Albuquerque | NM | 87185-0405 |
| SNL(NM) | Dr | Jerry | Cuderman | 244- | 844-8063 | 844-8745 | Albuquerque | NM | 87185-0482 |
| SNL(NM) | Mr | Dave | Fordham | | 844-8968 | 844-9293 | Albuquerque | NM | 87185-0417 |
| SNL(NM) | Mr | Larry | Moore | | | 844-9524 | Albuquerque | NM | 87185-0486 |
| SNL(NM) | Mr | Kazuo | Oishi | 244- | 844-0159 | 844-8745 | Albuquerque | NM | 87185-0482 |
| SNL(NM) | Mr | William | Plummer | | 845-8356 | 844-1977 | Albuquerque | NM | 87185-0175 |
| SNL(NM) | Mr | Jim | Solberg | 244- | 844-1135 | 844-7857 | Albuquerque | NM | 87185-0865 |
| Sandia Labs (CA) | | | | | | | | | |
| SNL(CA) | Dr | Jim | Hogan | | 294-2853 | 294-1015 | Livermore | CA | 94550-0969 |
| CONTRACTORS | | | | | | | | | |
| Teledyne Brown | Mr | Jack | Bogusch | 246- | 846-8575 | 846-8611 | Albuquerque | NM | 87117 |
| Logicon/RDA | Dr | Phil | Castillo | | 842-8156 | 242-4121 | Albuquerque | NM | 87119-5000 |
| Orion International Te | Mr | Mike | Rafferty | | 881-2500 | 881-5060 | Albuquerque | NM | 87110-6501 |
| KSC,Adv Electronics | Dr | F.C. | Yang | | 450-5772 | 450-2553 | Santa Monica | CA | 90405 |

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APPENDIX C
EXECUTIVE WORKING GROUP MEMBERSHIP

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**APPENDIX D
MEETING OBJECTIVES**

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Meeting Objective

To give the Working Group Chairman an opportunity to present their groups results and conclusions allowing for comments and discussion from all study group participants. Close attention should be given to the VWG test data impact on the FAAT estimates. Particular attention should be given to VWG/MAWG agreement on the use of that data in the MOEs selected for all four mission areas.

EWG Meeting Objective

To discuss all options available on the HPRF Phase 2 Feasibility Study at this time and reach consensus on which one to take and how we get there. Most probable option is to complete study as planned and draw on groups expertise to make the appropriate recommendations.

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**APPENDIX E
PROGRAM UPDATE**

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SCHEDULE/MILESTONES

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HPRF Phase 2 Study Milestones

| Milestone | Due | Complete | Remarks |
|---|----------|----------|---|
| <input type="checkbox"/> Meetings | | | |
| <input checked="" type="checkbox"/> Completed Meetings | | | 12 mtgs completed fr 11 Aug 92 Planning Mtg |
| <input type="checkbox"/> Future Meetings | | | |
| <input type="checkbox"/> STRATCOM EWG Conclusions Mtg | 3/22/95 | | Offutt AFB, Omaha, NE |
| <input type="checkbox"/> NWI EWG Final Mtg to review report | 5/16/95 | | Albuquerque, NM |
| <input type="checkbox"/> Working Groups Milestones | | | |
| <input checked="" type="checkbox"/> RWG | 12/15/94 | 1/24/95 | Summary & Draft Report |
| <input type="checkbox"/> SWG | 1/17/95 | 2/2/95 | Draft Report, Summary due 15 Feb 95 |
| <input type="checkbox"/> WDWG | 12/15/94 | 1/31/95 | Draft Report, Summary due 15 Feb 95 |
| <input type="checkbox"/> SEWG | 1/17/95 | 1/31/95 | Summary, Draft Report due 1 Mar 95 |
| <input type="checkbox"/> VWG | 2/28/95 | | Summary, Draft Report due 31 Mar 95 |
| <input type="checkbox"/> MAWG | 2/28/95 | | Summary, Draft Report due 31 Mar 95 |
| <input type="checkbox"/> Reports | | | |
| <input checked="" type="checkbox"/> Mid Term Report | | 2/2/94 | Complete & Distributed |
| <input type="checkbox"/> Final Report | | | |
| <input checked="" type="checkbox"/> Draft Layout & Content | | 5/3/94 | |
| <input checked="" type="checkbox"/> Receive WG Outlines | | 5/31/94 | |
| <input type="checkbox"/> Prepare Draft | 7/1/94 | 4/14/95 | |
| <input type="checkbox"/> Distribute Draft | | 4/21/95 | |
| <input type="checkbox"/> Final to printer | | 5/31/95 | |
| <input type="checkbox"/> Distribute | | 6/15/95 | |
| <input type="checkbox"/> Briefings | | | |
| <input checked="" type="checkbox"/> Mid-Term Briefings | | | |
| <input type="checkbox"/> Final Briefings | | | |
| <input type="checkbox"/> SAF/AQQ | 7/11/95 | | Wash DC |
| <input type="checkbox"/> NWCS | 7/12/95 | | Wash DC |
| <input type="checkbox"/> HQs DOE | 7/13/95 | | Wash DC |
| <input type="checkbox"/> HQs DNA | 7/13/95 | | Wash DC |
| <input type="checkbox"/> AFSPC | 7/25/95 | | Colorado Springs, CO |
| <input type="checkbox"/> USSTRATCOM | 7/31/95 | | Omaha, NE |

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Working Group Inputs to Final Report

31 January 1995

| <u>Working Group Items Due</u> | <u>Date Due</u> | <u>Date Received</u> |
|---------------------------------|-----------------|----------------------|
| <u>RWG</u> | | |
| MCs** | 15 Dec 94 | 24 Jan 95 |
| STS** | 15 Dec 94 | 24 Jan 95 |
| Unique Issues* | 15 Dec 94 | 24 Jan 95 |
| Summary for Study Group Report* | 15 Dec 94 | 24 Jan 95 |
| <u>SWG</u> | | |
| Draft SWG Final Report*** | 17 Jan 95 | 2 Feb 1995 |
| Summary for Study Group Report* | 15 Feb 95 | |
| Final SWG Report**** | 31 Mar 95 | |
| <u>SEWG</u> | | |
| Draft SEWG Final Report*** | 1 Mar 95 | |
| Summary for Study Group Report* | 17 Jan 95 | 31 Jan 1995 |
| Final SEWG Report**** | 31 Mar 95 | |
| <u>WDWG</u> | | |
| Draft WDWG Final Report** | 15 Dec 94 | 31 Jan 1995 |
| Summary for Study Group Report* | 15 Feb 95 | |
| Final WDWG Report** | 31 Mar 95 | |
| <u>VWG</u> | | |
| Draft VWG Final Report*** | 31 Mar 95 | |
| Summary for Study Group Report* | 28 Feb 95 | |
| Final VWG Report**** | 28 Apr 95 | |
| <u>MAWG</u> | | |
| Draft MAWG Final Report*** | 31 Mar 95 | |
| Summary for Study Group Report* | 28 Feb 95 | |
| Final MAWG Report**** | 28 Apr 95 | |

* Dist to Study Group Chairman & included in main body of Study Group Report.

** Dist to Study Group Chairman & included in appendix of Study Group Report.

*** Distributed to Executive WG (21 copies required).

**** Published as separate stand alone report & distributed to list established.

Note: WG summary & Final Reports will be paragraph classified marked.

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APPENDIX F
SECURITY CLASSIFICATION GUIDANCE

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APPENDIX G
SURETY WORKING GROUP FINAL REPORT

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SURETY WORKING GROUP REPORT

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SWG Approach, Activities

- Used QFD approach to evaluate surety of warhead candidates
 - Nuclear Safety
 - Operational Safety
 - Material Dispersion
 - Use Control
- All evaluations complete and peer reviewed
- Completed 1st draft of SWG final report: SWG reviewed it on January 11
- Draft #2 is complete

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PRELIMINARY NUCLEAR SAFETY ASSESSMENT OF HPRF

| EVALUATION CRITERIA | Weight | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
|------------------------------|--------|----|----|----|----|----|----|----|----|---|----|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|----|----|-----|----|----|
| DIRECT INITIATION RESISTANCE | 5 | 2 | 10 | 1 | 2 | 5 | 10 | -1 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | |
| INSENSITIVITY OF DETONATORS | 2 | 0 | 0 | 1 | 2 | 2 | 4 | -1 | 1 | 2 | 2 | -2 | 1 | 2 | 2 | -2 | 1 | 2 | 2 | -2 | 1 | 2 | 2 | -2 | 1 | 2 | 2 | -2 | 1 | 2 | 2 | -2 | 1 | 2 | 2 | -2 | 1 | 2 | 2 |
| EXCESS THERMAL RESISTANCE | 10 | 2 | 20 | 2 | 2 | 20 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 |
| EXCESS MECHANICAL RESISTANCE | 10 | 2 | 20 | 1 | 2 | 10 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 | 0 | 1 | 2 | 20 |
| ISLAND DISCRIMINATION | 5 | 2 | 10 | 2 | 2 | 10 | 10 | -1 | -1 | 2 | 10 | -5 | -1 | 2 | 10 | -5 | -1 | 2 | 10 | -5 | -1 | 2 | 10 | -5 | -1 | 2 | 10 | -5 | -1 | 2 | 10 | -5 | -1 | 2 | 10 | -5 | -1 | 2 | 10 |
| ISLAND BYPASS RESISTANCE | 8 | 2 | 16 | 1 | 1 | 8 | 8 | -2 | 1 | 1 | 8 | -16 | 0 | 1 | 1 | 8 | -16 | 0 | 1 | 1 | 8 | -16 | 0 | 1 | 1 | 8 | -16 | 0 | 1 | 1 | 8 | -16 | 0 | 1 | 1 | 8 | -16 | 0 | 1 |
| STRONGLINK LOCATION | 8 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 | 0 | 16 | 0 | 0 | 2 |
| WEAKLINKS | 6 | 0 | 0 | 2 | 1 | 12 | 6 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | 10 | 76 | 12 | 83 | 12 | 78 | -5 | 4 | 28 | 5 | 38 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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APPENDIX H
REQUIREMENTS WORKING GROUP FINAL REPORT

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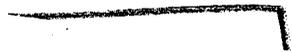
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SYSTEMS ENGINEERING WORKING GROUP
FINAL REPORT

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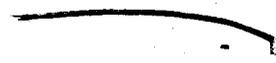
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**APPENDIX J
WARHEAD DESIGN WORKING GROUP
FINAL REPORT**

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NEW MEXICO CANDIDATES OUTPUT

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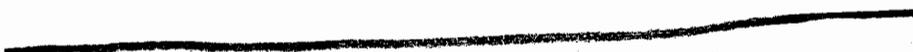
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VULNERABILITY TEST PROGRAM RESULTS

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**NEW MEXICO DESIGN TEAM CANDIDATES
CONCLUSIONS**

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JOHN H. BROWNELL
X-6 GROUP LEADER

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**APPENDIX K
VULNERABILITY WORKING GROUP
FINAL REPORT**

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Topics of Discussion

- Background and Objectives
- Mission Area Descriptions
- FAAT Analysis Method
- Vulnerability Test Program
- Summary Vulnerability Assessments
- Preliminary Conclusions
- Remaining Activities

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VWG Objectives

- Develop vulnerability data to support Mission Analysis Working Group
- Identify appropriate measure of effectiveness (MOE) criteria
- Update and validate vulnerability models from the Phase 1 study

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HPRF Phase 2 Study

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Primary Participants by Mission Area

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FAAT Methodology

• Threat Characteristics

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• Susceptibility (strength)

Limitations

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VWG

- By Target Class
- Stress Distributions
- Strength Distributions
- Probability of Effect/Confidence

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Preliminary Conclusions

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Preliminary Conclusions
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• The equipment which was tested is less susceptible than predicted in the Phase 1 study

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HPRF Phase 2 Study

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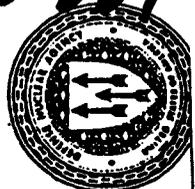
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Mission area conclusions pending input from LLNL

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• Findings and conclusions pending input from SNL

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**APPENDIX L
MISSION ANALYSIS WORKING GROUP
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HPRF PHASE II MEETING (U) MISSION ANALYSIS

David Fordham
Sandia National Laboratories
Strategic Offense Studies

January 31, 1995

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DTRA
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DAMAGE ASSESSMENT OBSERVATIONS

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- Results are low confidence

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WHEN IT RAINS, IT POURS

After a long drought, I find myself flooded with models

● Possible causes:

- Units

- Strength estimates

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DOE
b(3)
DTRA

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HPRF95_4



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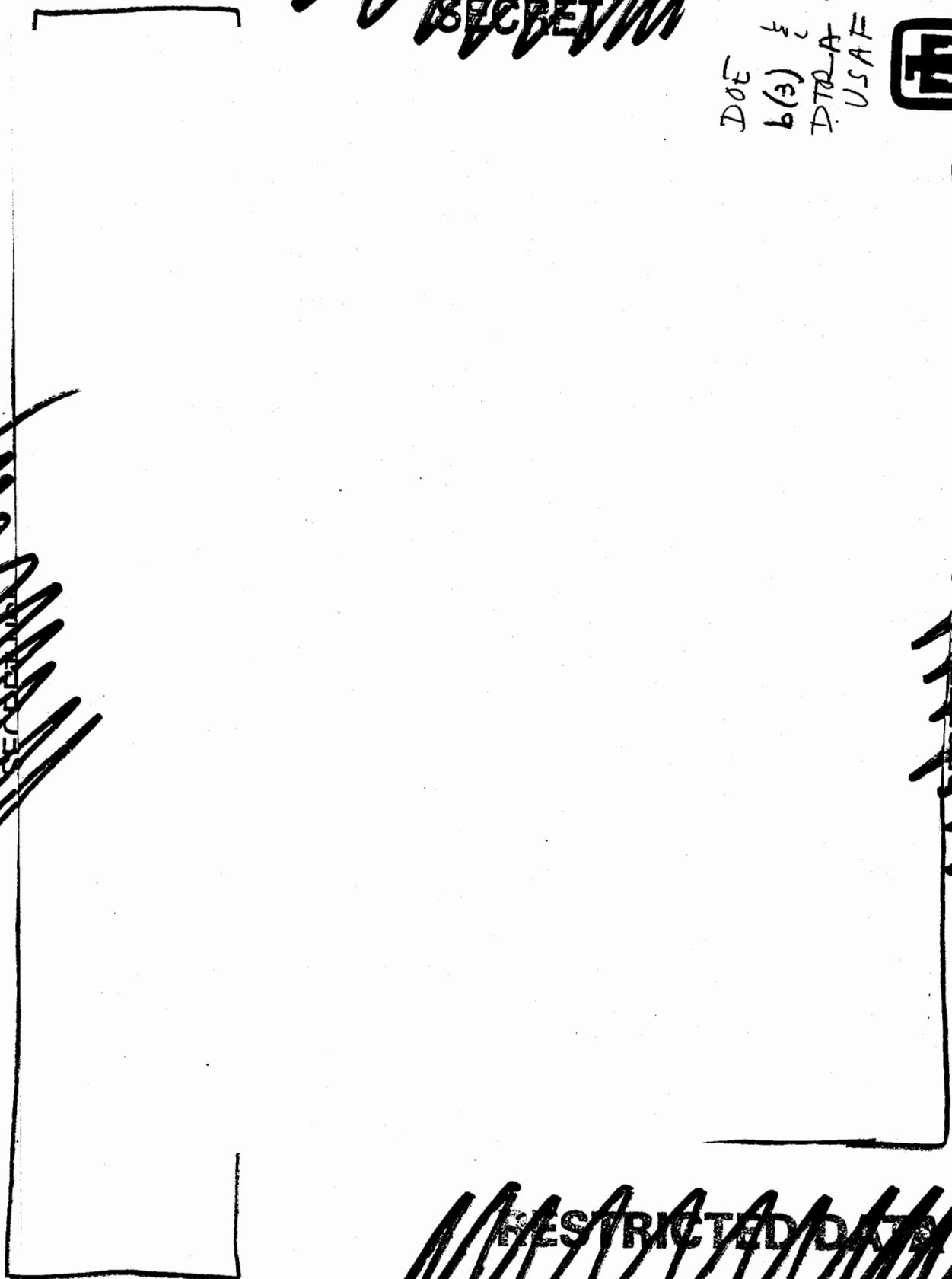
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DOE
b(3) &
USAF

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DOE
b(3) &
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DOE
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DOE
b(3) $\frac{1}{2}$
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DOE
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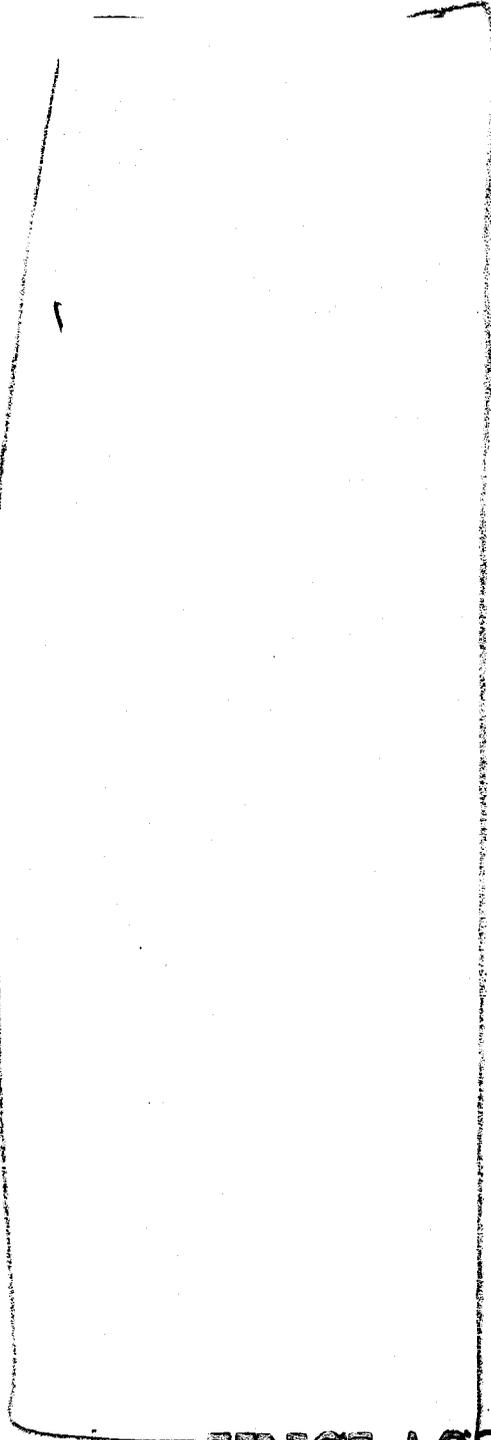
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**APPENDIX M
RESPONSE TO AI 94-4-5**

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