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REPLY TO Nuclear Weapons Integration Division (NWI)
ATTN OF: 1651 First Street, SE; Kirtland Air Force Base, New Mexico 87117-5617

SUBJECT: High Power Radio Frequency (HPRF) Phase 2 Study General Meeting # 7 Minutes

TO: DISTRIBUTION

1. Attached is a copy of the Minutes from the HPRF Phase 2 Study General Meeting # 7 held 9 December 1993 at Sandia National Laboratories, Albuquerque, New Mexico. If you have any questions or comments please give me a call at (505) 846-4001, extension 208 or DSN 246-4001, extension 208.

2. This letter is UNCLASSIFIED.

Keith M Baird
Keith M. Baird
HPRF Study Director
Nuclear Advanced Concepts Branch

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HPRF Phase 2 Study General Meeting # 7
Minutes including Distribution List (S-RD)

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MINUTES

HIGH POWER RADIO FREQUENCY (HPRF)
PHASE 2 STUDY GENERAL MEETING # 7
9 DECEMBER 1993

Keith M. Baird
HPRF Study Director

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MINUTES

HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7

9 DECEMBER 1993

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7

9 DECEMBER 1993

I. (U) INTRODUCTION. The High Power Radio Frequency (HPRF) Phase 2 Study General Meeting # 7 was hosted by Sandia National Laboratories (SNL), Albuquerque, New Mexico, on 9 December 1993. Mr Keith Baird, HPRF Study Director, Nuclear Advanced Concepts Branch (NWIC), Nuclear Weapons Integration Division (NWI), chaired the meeting.

A. (U) Administration. Mr Baird welcomed the attendees and Dr Jerry Cuderman, SNL, provided administrative information. Eighteen Government agencies and contractors were represented at the meeting. A special thanks to Dr Cuderman and SNL for hosting the meeting. The meeting agenda and list of attendees are attached as Appendices A and B, respectively.

B. (U) Review of Executive Working Group Membership. All members and observers or their representatives, except for the Ballistic Missile Office, were present. Mr George Baker, Headquarters Defense Nuclear Agency, was added as a member and Mr Stanford Gooch, United States Strategic Command, was added as an observer. Current members and observers, and their organizations are identified in Appendix C.

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II. (U) DISCUSSION TOPICS.

A. (U) Program Update. Mr Baird, HPRF Study Director, addressed program issues and schedule that were discussed at the Executive Working Group Meeting on 8 December 1993 (Appendix D). With the Department of Defense (DoD) downsizing the nuclear stockpile, the Secretary of Defense directed a Nuclear Posture Review which addressed United States security strategy, force structure, force operations, safety and security, counterproliferation policy, and threat reduction policy. Based upon the changing political environment, since the Cold War ended, the latitude of the HPRF Phase 2 Study tasking was addressed at this meeting. It was agreed to continue addressing the primary option Minuteman III/Single Reentry Vehicle (MK 12A or MK 21), and also investigate other options within the resources allowed by the Department of Energy (DOE), if beneficial to enhancing weapon effectiveness.

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An action item to investigate this was assigned to the Mission Analysis and Vulnerability Working Groups (MAWG and VWG). It was further agreed to remove limitations based upon targeting in order to address all targets and not be limited due to chosen scenarios. Although the tasking on this study has not changed, areas needing further consideration include reentry vehicle shell limitations, warhead parameters, warhead reliability and certification, arming and fuzing, use control, safety technology. Additionally, the need to document study results while expertise is still

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around was emphasized. The minutes from all meetings will be the audit trail for the study group. Overall, communications need to be improved between working groups to ensure action items assigned are completed and properly documented. The study's midterm report will be published in January 1994 with a presentation planned for the Nuclear Weapons Council Standing Committee in February 1994. The study ends in March 1995 with the final report due in April 1995.

B. *[Handwritten scribble]* Surety Working Group Report.

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The SWG effort is divided into three areas; operational safety, nuclear detonation safety, and use control.

The Quality Function Deployment process is continuing with evaluation criteria being reviewed.

In the nuclear detonation safety area, the process for reviewing candidate designs is essentially complete. The first cut at an evaluation was addressed in September 1993, but still waiting for final warhead candidate designs. Use control is also new for land-based missile systems. The draft DoD Directive "Controlling the Use of Nuclear Weapons", has a new policy requiring use

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control on all new systems including land-based missile systems.

The use control requirements/policy review is complete and the overall approach is defined. Also, preliminary review of missile systems/warhead interfaces is complete.

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C. *AMM* Requirements Working Group Report

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The RWG met on 7 December 1993 to review HPRF MC action items from a Technical Interchange Meeting (TIM) held on 3-4 November 1993. The TIM was held to review comments on the initial draft of the HPRF MCs. Draft 2 has since been published and distributed to working group members. Comments on the MCs Draft 2 are due to NWIW by 21 January 1994 to support the RWG TIM in February 1994 with results to be discussed at the next HPRF General Meeting. Additionally, the Stockpile-to-Target Sequence (STS) Draft 2 document has been distributed to working group members with comments also due by 21 January 1994 to support the next RWG TIM in February 1994.

RWG is working two action items on use control and STS radiation environments assigned by the Systems Engineering Work Group (SEWG).

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D. (U) Systems Engineering Working Group Report.

presented a status of the issues from the 7 December 1993 SEWG meeting which included Minuteman III weapon system information, New Mexico and California design candidates information, surety concept issues, and responses to action items (Appendix G).

1. (U) **The MMIII SRV Program and GRP.** The Minuteman III (MMIII) Single Reentry Vehicle (SRV) Program and Guidance Replacement Program (GRP) were discussed with a tentative schedule on these programs presented. The goals for both programs are to provide the capability for de-MIRVing the Minuteman III missiles to single MK 12 or MK 12As. The ability to place the MK 21 on the Minuteman III missile will not be precluded by either of these two changes. The placement of MK 21s on Minuteman III missiles remains a goal of the United States Air Force (USAF).

2. (U) **New Mexico Design Candidates Information.**

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3. (U) California Design Candidates Information.

- a. ~~SECRET~~ The preliminary use control concepts being considered for the California warhead candidates were summarized and will evolve over the next few months.

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4. (U) **Surety Concept Issues.** The issues that the SEWG must consider as the surety concepts for the warhead candidates are developed were summarized and included integrated arming, fuzing and firing; power and communications; and use control.

5. ~~SECRET~~ **Action Item Responses.** RWG responses to action items requested by the SEWG were presented. The radiation level question was reworded to the RWG. What radiation levels must the HPRF warhead survive during launch, mid-flight and reentry? The information is primarily needed to establish the hardening level for the warhead's electronics.

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E. (U) Mission Analysis Working Group Report

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Currently, the major emphasis is

on the modeling effort for all mission areas.

Three action items were addressed

including the mission need statement, mission modeling work, and the funding shortfall.

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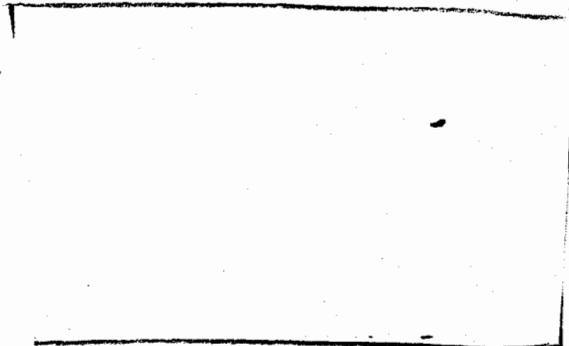
Finally

tasked all MAWG analysis

leaders to provide a timeline-to-completion chart to help the group keep better track of analysis work and for incorporation into future meeting minutes.

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F. (U) Warhead Design Working Group Report



1. ~~AWG~~ Primary Candidates Certification. Certification of the primary candidates was discussed.

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It is clear the

present testing moratorium will impact the current certification process for WR warheads.

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3. ~~SECRET~~ Action Items Responses.

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There are no anticipated measures to reduce INRAD in the warhead design at this time.

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1. ~~MM~~ USAF Phillips Laboratory Testing.

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2. ~~MM~~ SNL Testing.

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3. ~~MM~~ LLNL Testing.

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4. ~~WY~~ LANL Testing. LANL has zeroed out all funds for HPRF testing support.

Because of the test approach used, the data from these tests must

be reviewed to determine its applicability to the MAWG analysis.

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6. (U) MAWG Analysis Support.

Two data entry methods will be provided. One will facilitate the entry of FAAT-like data and the other will allow the entry of cross-sections or transfer functions from the test programs.

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III. (U) ACTION ITEMS. Fifty-two action items have been closed from previous meetings and eighteen action items remain open. Eight new action items were assigned as a result of this meeting and the various working groups.

A. (U) Old Action Items.

1. (U) Assigned to Capt Lamb, Office of Aerospace Studies (OAS): Contact OL-NS regarding the chair of the Surety Working Group (SWG). *OL-NS did not have enough personnel to chair the SWG. Traditionally, OL-NS was the organization responsible for this position. Therefore, OL-NS was queried and stated that they did not mind if the chair of the working group was from one of the National Laboratories.* This action item is closed.

2. (U) Assigned to Sandia National Laboratories (SNL): Determine the chair of the System Engineering Working Group (SEWG). *SNL was the usual chair to the SEWG. The decision to chair this working group was left to SNL because either New Mexico*

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(NM) or California (CA) would be the chair. As a result of the decision to let SNL NM chair the SWG, SNL CA was chosen to chair the SEWG. This action item is closed.

3. (U) Assigned to Lawrence Livermore National Laboratory (LLNL) and Los Alamos National Laboratory (LANL): Determine the chair of the Warhead Design Working Group (WDWG). *The WDWG chair would be decided between the two laboratories that had the expertise. At the time of the first meeting, it was decided between LLNL and LANL that the chair for the WDWG would be Dr. Mercer-Smith, LANL. This action item is closed.*

4. (U) Assigned to Defense Nuclear Agency (DNA) and the National Laboratories: Produce an agreement on effects testing - SEE ACTION ITEM 50. *The Secretary of the Air Force for Acquisition (SAF/AQQS) requested a testing plan be coordinated among the organizations involved in the High Power Radio Frequency (HPRF) Phase 2 Study that would be conducting vulnerability testing during the study. Therefore, the chair of the Vulnerability Working Group (VWG), along with the organizational representatives, produced a master plan of the testing activities proposed throughout the HPRF Phase 2 Study. This plan was produced in January 1993 and distributed to the participants involved with testing. This action item is closed.*

5. (U) Assigned to Capt Lamb, OAS: Contact the United States Navy (USN) about participation in the HPRF Phase 2 Study. *The tasking letter from the Nuclear Weapons*

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Council Standing Committee (NWCSC) requested that the USN participate during the HPRF Phase 2 Study. Capt Lamb contacted a USN representative (Mr Ben Wosoogh, USN - Strategic Systems Program, 27221) about their participation. At the December 1992 meeting (Meeting #3), Mr Wosoogh, stated that the USN would provide an observer to attend the meetings only to stay abreast of the developments and would not actively participate. This action item is closed.

6. (U) Assigned to LtCol Martin, SAF/AQQS: Provide contacts for the United States Air Force (USAF) Ballistic Missile Office (BMO) and Ogden, Air Logistics Center (OO-ALC). *LtCol Martin provided the names and numbers of the personnel from BMO and OO-ALC. These personnel were contacted and have participated in the HPRF Phase 2 Study. This action item is closed.*

7. (U) Assigned to Capt Lamb, OAS: Invite Maj Harstine, USAF Phillips Laboratory (PL), to participate in the HPRF Phase 2 Study. *Capt Lamb contacted Maj Harstine, PL, to participate in the HPRF Phase 2 Study. Maj Harstine did attend the meetings and has provided an individual (Capt Lurang, PL) to be the contact during the HPRF Phase 2 Study. Their expertise is in the space environment area. This action item is closed.*

8. (U) Assigned to Mr Gazda, Headquarters Department of Energy (HQ DOE): Investigate the requirements for weapon certification. The Warhead Design Working

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Group (WDWG) will investigate. *Mr Gazda was tasked to investigate the requirements for certification of a warhead if the testing moratorium on underground tests was continued. His response was the WDWG would propose methods for the certification issued. Therefore, the WDWG is continuing to investigate this issue and will provide input during the HPRF Phase 2 Study. This action item is closed.*

9. (U) Assigned to Mr Walton, Phillips Laboratory/WST (PLWST): Relook at the funding levels for HPRF Phase 2 Study testing at PL. *Mr Walton investigated the funding levels at PL for the testing program of their organization. PL was able to procure the required amount of funding that will meet their obligation during the HPRF Phase 2 Study. This action item is closed.*

10. (U) Assigned to Each Working Group Chair: Produce draft charters for kickoff meeting. *Each working group chair was to provide a draft charter of their working group for use during the kick-off meeting. The draft charters were provided and included in the HPRF Phase 2 Study General Meeting #1 Minutes. This action item is closed.*

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12. (U) Assigned to Each Working Group Chair: Provide charters, milestone schedules, and member listings to the HPRF Phase 2 Study Director by 12 October 1993. *Updated charters, schedules and member listings were provided to the HPRF Phase 2 Study Director. This action item is closed.*

13. (U) Assigned to LtCol Atchison, Field Command Defense Nuclear Agency (FCDNA): Hold a meeting to finalize the testing plan - SEE ACTION ITEM 50. *The testing plan meeting was held at FCDNA and a coordinated test plan was produced. This action item is closed.*

14. (U) Assigned to Capt Lamb, OAS: Contact the USAF BMO and OO-ALC for participation in the SEWG. *BMO and OO-ALC were contacted by Capt Lamb. They provided names of individuals to participate in the SEWG. This action item is closed.*

15. (U) Assigned to Capt Lamb, OAS: Contact the USN about study participation (Mr Clifton DeJong, Kaman Sciences Incorporated). *Capt Lamb contacted Mr Ben Wosoogh, USN, about participation in the HPRF Phase 2 Study. The USN is only participating as an observer. Mr DeJong, Kaman Sciences Incorporated, will attend the meetings and provide information to the USN about the HPRF Phase 2 Study's progress. This action item is closed.*

16. (U) Assigned to Capt Powell, HQ ACC: Provide the HPRF Phase 2 Study Director with a listing of the efforts of organizations contacted to support the functions

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of the Mission Analysis Working Group (MAWG). *Capt Powell (MAWG Chair) could not count on full support from organizations for analysis work in the mission area. Therefore, he compiled a list of the organizations he contacted to provide support during the HPRF Phase 2 Study. This action item is closed.*

17. (U) Assigned to Mr Wosoogh, USN: Report the level of USN participation in the HPRF Phase 2 Study. *Mr Wosoogh reported the USN is only participating as an observer. This action item is closed.*

18. (U) Assigned to Capt Lamb, OAS: Provide the USN with a copy of the HPRF Phase 1 Study Final Report. *Capt Lamb provided a copy of the HPRF Phase 1 Study Final Report to Mr Wosoogh, USN. This action item is closed.*

19. (U) Assigned to Capt Powell, HQ ACC: Request a white paper confirming the deconfliction concerning employment of the HPRF device. *Capt Powell provided a paper copy of the employment deconfliction when using the HPRF device. Basically, the warhead would be used in accordance with its capabilities and desired effects in conjunction with war fighting plans. This action item is closed.*

20. (U) Assigned to Capt Sanders, BMO: Provide the parameters of the MMIII as a delivery vehicle using an HPRF device to the Systems Engineering Working Group (SEWG) and Requirements Working Group (RWG). *Capt Sanders provided the*

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parameters of the MMill delivery vehicle for use with the HPRF device to the SEWG and RWG. This action item is closed.

21. (U) Assigned to Capt Powell, HQ ACC: Provide a status of the draft mission need statement for the HPRF device. Capt Powell provided an update on the development of a mission need statement which could be applicable to the HPRF. The draft mission need statement was regenerated with the reorganization of the USAF and the change of commands from Headquarters Strategic Air Command (HQ SAC) to HQ ACC. This action item is closed.

22. (U) Assigned to Capt Lamb, OAS: Request a white paper on the assessments of the effects from an HPRF device.

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[Redacted] The assessment was done by PLWSA and a report was filed in the case file for inclusion in the HPRF Phase 1 Study Final Report. This action item is closed.

23. (U) Assigned to Ms Fattor, OL-NS/ENN:

[Redacted] The final decision would be made in an HPRF Phase 2A Study. This action item is closed.

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24. (U) Assigned to Ms Fattor, OL-NS/ENN: Determine the indicator of gas transfer. Ms Denise Fattor (RWG Chair) asked if an indication of gas transfer for a particular design was required, or could be required, by the USAF. HQ ACC stated that it could be required, but again, the decision will not be made until the HPRF designs are finalized and the implications are studied. This action item is closed.

25. (U) Assigned to the RWG: Provide Military Characteristics (MCs) and Stockpile-to-Target Sequence (STS) documents to the SWG. This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.

26. (U) Assigned to the RWG: Provide MCs and STSs to the SEWG. This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.

27. (U) Assigned to the SEWG: Provide information to support the development of HPRF surety themes to the SWG. This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.

28. (U) Assigned to the SEWG:

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This action item is dependent upon the final designs, and will not

be addressed during the HPRF Phase 2 Study. This action item is closed.

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29. (U) Assigned to the SWG: Provide the Deputy Assistant Secretary for Military Applications (DASMA) HPRF Phase 2 Study draft surety theme to the SEWG. *This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open.* This action item is **ongoing**.
30. (U) Assigned to the WDWG: Provide information to support the development of HPRF surety themes to the SWG. *This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open.* This action item is **ongoing**.
31. (U) Assigned to the WDWG: Provide the warhead design characteristics to the SEWG. *This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open.* This action item is **ongoing**.
32. (U) Assigned to the WDWG: Provide the warhead output levels to the RWG and MAWG. *This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open.* This action item is **ongoing**.
33. (U) Assigned to Dr Cuderman, SNL NM: Provide inputs to the Executive Working Group (EWG) on the 90 day program briefings. *Dr Cuderman (SWG Chair) provided the schedule and timeline information to the EWG for the 90 day briefing to the NWCSC.*
This action item is **closed**.
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39. (U) Assigned to PL and DNA: Examine test responsibility. *The responsibilities for the completion of testing, analysis, and reporting of results for each test object was defined. Each testing organization provides a Director with the responsibility for the test object defined in the testing plan, and will provide the final report of the results from each test object. This action item is closed.*

40. (U) Assigned to LANL: Investigate the funding alternatives for the participation of a contractor. *A contractor's work was essential for the analysis of test data. LANL proposed to provide the funding for a contractor to complete the work and subsequently funded the work. This action item is closed.*

41. (U) Assigned to Maj Weitekamp, HQ DNA: Investigate the United States Army (USA) testing. *Maj Weitekamp investigated the testing programs the USA was involved with that could be pertinent to the HPRF program.*

This action item is closed.

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42. (U) Assigned to the Test Directors: Provide test plans for review by the VWG Chair. *The test directors from each laboratory provided test plans to the VWG Chair for review. This review investigated the tests to confirm that the results would meet the requirements for the HPRF Phase 2 Study. This action item is closed.*

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43. (U) Assigned to Capt Lamb, OAS: Identify the action items. *Capt Lamb identified the action items for the working groups. This action item is closed.*

44. (U) Assigned to the SEWG:

This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.

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45. (U) Assigned to the SEWG: Provide the WDWG with hardware availabilities. *This action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.*

46. (U) Assigned to Capt Lamb, OAS: Provide the HPRF Phase 2 Study overview to the Intercontinental Ballistic Missile (ICBM) Project Officers Group (POG). *Capt Lamb presented a briefing of the HPRF Phase 2 Study to the ICBM POG. This action item is closed.*

47. (U) Assigned to HQ ACC: Determine the LLCE replacement organization. *The LLCE replacement organization for ICBMs currently involves the logistics people from the Air Force Materiel Command (AFMC) and the maintenance people from Headquarters Air Force Space Command (HQ AFSPACECOM). This action item is closed.*

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48. (U) Assigned to Capt Lamb, OAS: Determine the OAS/XRS environments for the HPRF device STS. *The nuclear environments involving the HPRF device were calculated by PLWSM and presented at the VWG meeting and enclosed in the HPRF Phase 2 Study General Meeting #4 Minutes. This action item is closed.*

49. (U) Assigned to Each Working Group Chair: Provide Capt Lamb, OAS, with the funding shortfall statements (i.e., dollars versus impacts). *The funding shortfalls and their impacts were provided to the HPRF Phase 2 Study Director as they were identified. The current shortfalls have been addressed and will continue to be addressed as they become evident. This action item is closed.*

50. (U) Assigned to LtCol Atchison, FCDNA: Produce a test plan for the VWG to provide input for the NWCSC brief. *LtCol Atchison produced the draft test plan for the HPRF program and provided the information for inclusion in the NWCSC brief. This action item is closed.*

51. (U) Assigned to the MAWG:

closed.

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52. (U) Assigned to Capt Lamb, OAS: Provide the validation methodology to LtCol Martin, SAF/AQQS, for the NWCSC brief. *The validation methodology for the*

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HPRF Phase 2 Study was provided in the NWCSC briefing package. This action item is closed.

53. (U) Assigned to the EWG: Address the fifth mission area in the tasking letter. *The fifth mission area in the tasking letter is being addressed as resources become available during the remainder of the HPRF Phase 2 Study. Original discussions placed other mission areas at a higher priority because it was felt that the study could generate more worthwhile information by focusing the efforts on the first four mission areas.* This action item is ongoing.

54. (U) Assigned to the SAF/AQQS(N): Determine whether an earthquake is considered an abnormal environment. *An earthquake could be an abnormal or normal environment depending upon the severity and the location of HPRF basing. The information for this action item will be provided when the final design and basing decisions are made. It is premature at this time to provide a definition.* This action item is closed.

55. (U) Assigned to LtCol Atchison and Mr Gutierrez, FCDNA:

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56. (U) Assigned to Each Working Group Chair: Provide timelines of the information required from the other working groups. *The working group chairs are to continue providing timelines to the EWG to insure that the proper information flow will occur and not cause a delay in the final results from the HPRF Phase 2 Study. This action item is ongoing.*

57. (U) Assigned to All Identified: Responses to the SEWG questions. *The responses to the questions from the SEWG posed at the HPRF Phase 2 General Meeting #4 have been answered to the satisfaction of the SEWG at this time. More definition of the warhead is required before further questions will be asked. This action item is closed.*

58. (U) Assigned to SAF/AQQS(N): What is the impact of the Fail-Safe and Risk Reduction (FARR) requirements on the HPRF Phase 2 Study? *The FARR requirements will impact this study by providing possible guidance of requirements for the designed warhead and delivery vehicle. At this time, the HPRF Phase 2 Study will proceed with options and try to address all of the FARR requirements, but will not delay design decisions waiting for implementation of FARR requirements. This action item is closed.*

59. (U) Assigned to the WDWG and SEWG: Provide working group inputs to the SWG. *This action item is a requirement for working groups during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.*

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60. (U) Assigned to the WDWG and SEWG: Provide working group inputs to the RWG. *This action item is a requirement for working groups during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.*

61. (U) Assigned to the WDWG: This DOE,
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action item is a requirement for a working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action is ongoing.

62. (U) Assigned to the RWG: Provide the second iteration of the MCs to all of the working groups. *The second iteration of the MCs has been provided to the pertinent members. This action item is closed.*

63. (U) Assigned to All Working Groups: Provide input to the RWG concerning the MCs. *This action item is a requirement for each working group during the course of the HPRF Phase 2 Study, therefore, it will remain open. This action item is ongoing.*

64. (U) Assigned to the MAWG and VWG: Provide the measures of weapon optimization to the WDWG. *The VWG provided an option for defining an optimization technique at the HPRF Phase 2 Study General Meeting #6. This action item is closed.*

65. (U) Assigned to the SEWG: Investigate the availability of a reentry vehicle (RV) shell. *The availability of an RV shell for use by the SEWG was identified. This action item is closed.*

66. (U) Assigned to the MAWG: Provide the VWG with additional target systems of interest. *The MAWG provided the VWG with a listing of the additional target systems of interest for the HPRF Phase 2 Study.* This action item is closed.

67. (U) Assigned to Each Working Group Chair: Provide the HPRF Phase 2 Study Director with an interim progress report for each working group. *Interim progress reports were provided by each working group chair to the HPRF Phase 2 Study Director for inclusion in the mid-term report.* This action item is closed.

68. (U) Assigned to the MAWG: Provide the HPRF Phase 2 Study Director with block diagrams of the mission areas being investigated. *Capt Roullard provided the HPRF Phase 2 Study Director with block diagrams of the mission areas being investigated, and they are included in the mid-term report.* This action item is closed.

69. (U) Assigned to the WDWG: Provide experimental data for the warhead designs. This action item is open.

70. (U) Assigned to the WDWG:
action item is open.

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B. (U) New Action Items.

7-1. (U) Assigned to the MAWG and VWG.

Suspense: March 1994.

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7-2. (U) Assigned to the SWG. Develop a separate safety section for the MCs to address a new requirement for the HPRF warhead. Provide information to the RWG as it becomes available. **Suspense: When warhead design is firm.**

7-3. (U) Assigned to the WDWG. What is the minimum LLCE interval determined by individual-warhead candidate design features? Provide information to the RWG as it becomes available. **Suspense: When warhead design features are finalized.**

7-4. (U) Assigned to the WDWG. The TBDs in the intrinsic radiation paragraph 2.7.12 of the MCs need to be worked as the warhead design is finalized. Provide information to the RWG as it becomes available. **Suspense: When warhead design features are finalized.**

7-5. (U) Assigned to the WDWG.

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Provide information to the SEWG. **Suspense: March 1994.**

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7-6. (U) Assigned to the RWG. What STS radiation environment levels must the HPRF warhead survive during launch, mid-flight and reentry? Provide information to the SEWG. **Suspense: March 1994.**

7-7. (U) Assigned to the RWG. Provide HPRF MCs' Use Control requirements to the SEWG. *Use control is being worked based upon a new draft DoD Directive C-3150.aa., but is currently TBD for the HPRF program.* **Suspense: June 1994.**

7-8. (U) Assigned to Each Working Group Chair. Provide plan of action, along with timelines, to include major activities between December 1993 and end of study. Also, need working group schedules with milestones to incorporate into overall study schedule. Provide information to the HPRF Phase 2 Study Director. **Suspense: March 1994.**

IV. (U) NEXT MEETING. The HPRF Phase 2 Study General Meeting # 8 will be held in conjunction with the various working group meetings on 8-10 March 1994 at the USAF Phillips Laboratory in Albuquerque, New Mexico.

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**APPENDIX A
MEETING AGENDA**

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**APPENDIX B
LIST OF ATTENDEES**

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7 ATTENDANCE LIST 9 DECEMBER 1993

NAME	ORGANIZATION	TELEPHONE
ANGELOTTI, Philip	US Army ARDEC SMCAR-FSS-E/SWS Picatinny Arsenal NJ 07806-5000	DSN: 880-5451 COMM: 201-724-5451 STU III: FAX: 201-724-2375 CFAX:
ATCHISON, Walter	FCDNA/FCPRA 1680 Texas Street SE Kirtland Air Force Base NM 87117-5616	DSN: 246-8584 COMM: 505-846-8584 STU III: FAX: 505-846-8611 CFAX:
BAIRD, Keith	SA-ALC/NWIC 1651 First Street SE Kirtland Air Force Base NM 87117-5617	DSN: 246-9575 COMM: 505-846-9575 STU III: FAX: 505-846-4618 CFAX:
BARRY, William R	SA-ALC/NWIS 1651 First Street SE Kirtland Air Force Base NM 87117-5617	DSN: 246-9576 COMM: 505-846-9576 STU III: FAX: 505-846-4618 CFAX:
BERNARDIN, Michael	LANL/X-5 Mail Stop B259 PO Box 1663 Los Alamos NM 87545-2345	DSN: COMM: 505-667-1439 STU III: FAX: 505-665-7725 CFAX:
BLAND, Michael	LLNL/L-153 PO Box 808 Livermore CA 94550-0808	DSN: COMM: 510-422-9882 STU III: FAX: 510-423-5080 CFAX:
CARRILLO, Francisco	SA-ALC/NWW 1651 First Street SE Kirtland Air Force Base NM 87117-5617	DSN: 246-6767 COMM: 505-846-6767 STU III: 505-846-6767 FAX: 505-846-2038 CFAX: 505-846-6767
CHAMBELLAN, Curtis	DOE ALWQD Box 5400 Albuquerque NM 87185-5400	DSN: COMM: 505-845-5075 STU III: FAX: 505-845-4722 CFAX:

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7 ATTENDANCE LIST 9 DECEMBER 1993

NAME	ORGANIZATION	TELEPHONE
CHOW, Charles Tze S	LLNL/L-125 (DTED) PO Box 808 Livermore CA 94550-0808	DSN: COMM: 510-422-4639 STU III: FAX: 510-422-8185 CFAX:
CUDERMAN, Jerry F	SNL NM/5161 Mail Stop 0482 PO Box 5800 Albuquerque NM 87123-0482	DSN: 244-8063 COMM: 505-844-8063 STU III: FAX: 505-844-8745 CFAX:
DEJONG, Clifford	KAMAN SCIENCES POBox Box 7463 Colorado Springs CO 80933-5000	DSN: COMM: 719-599-1932 STU III: FAX: 719-599-1420 CFAX:
EDDLEMAN, Troy	LANL/X-4 Mail Station 5000 (Classified) Mail Station F664 PO Box 1663 Los Alamos NM 87544-1663	DSN: COMM: 505-667-6811 STU III: FAX: CFAX:
ERICKSEN, David K	OO-ALC/LMEW 6054 Dogwood Avenue Hill Air Force Base UT 84056-5816	DSN: 458-1752 COMM: 801-777-1752 STU III: FAX: 801-777-4643 CFAX: 801-777-1974
FAAS, Scott E	SNL CA/5371 Mail Stop 9014 PO Box 969 Livermore CA 94551-0969	DSN: COMM: 510-294-2287 STU III: FAX: 510-294-1015 CFAX:
FELLOWS, Steven B	DOE AL/WPD PO Box 5400 Albuquerque NM 87185-5400	DSN: COMM: 505-845-5397 STU III: FAX: 505-845-4209 CFAX:
FORDHAM, David M	SNL NM/4113 PO Box 5800 Albuquerque NM 87123-5800	DSN: COMM: 505-844-8968 STU III: FAX: 505-844-9293 CFAX:

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7

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9 DECEMBER 1993

NAME	ORGANIZATION	TELEPHONE
GAZDA, Joseph	US DOE/DP-251 PO Box A Germantown MD 20874-5000	DSN: COMM: 301-903-2984 STU III: FAX: 301-903-5658 CFAX:
GOOCH, Stanford R	USSTRATCOM/J541 901 SAC Boulevard Suite 2F25 Offutt Air Force Base NE 68113-6500	DSN: 271-2580 COMM: 402-294-2580 STU III: 402-294-2580 FAX: 402-294-4985 CFAX:
GUTIERREZ, Samuel	PLWSM 3550 Aberdeen Street SE, B-909 Kirtland Air Force Base NM 87117-5776	DSN: 246-9787 COMM: 505-846-9787 STU III: FAX: 505-846-4274 CFAX:
HAERTLING, Michael J	LANL/ESA-1 Mail Station 5000 (Classified) Mail Station C936 PO Box 1663 Los Alamos NM 87545-1663	DSN: COMM: 505-667-0592 STU III: FAX: 505-667-1878 CFAX:
HOGAN, James	SNL CA/5371 Mail Stop 9014 PO Box 969 Livermore CA 94551-0969	DSN: COMM: 510-294-2853 STU III: FAX: 510-294-1015 CFAX:
HOWARD II, Joseph S	LANL/TSA-5 Mail Station 5000 (Classified) Mail Station F602 PO Box 1663 Los Alamos NM 87545-1663	DSN: COMM: 505-665-6451 STU III: FAX: 505-665-2017 CFAX:
HUIE, Donald	US Army ARDEC SMCAR-FSN-N, B354 Picatinny Arsenal NJ 07806-5000	DSN: 880-2720 COMM: 201-724-2720 STU III: 201-724-2720 FAX: 201-724-5461 CFAX:
KEENE, Frederick W	TRW 953/1120 PO Box 1310 San Bernardino CA 92402-1310	DSN: 876-6461 COMM: 909-382-6461 STU III: FAX: 909-382-2503 CFAX:

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7

ATTENDANCE LIST

9 DECEMBER 1993

NAME	ORGANIZATION	TELEPHONE
KENYON, Christopher	ARL/AMSRL-WT-ND 2800 Powder Mill Road Adelphi MD 20783-5000	DSN: 356-2311 COMM: 703-490-2311 STU III: FAX: 703-491-8809 CFAX:
KROPF, Roger Lt Col, USAF	SA-ALC/NWIC 1651 First Street SE Kirtland Air Force Base NM 87117-5617	DSN: 246-9575 COMM: 505-846-9575 STU III: FAX: 505-846-4618 CFAX:
LAMB, William Capt, USAF	SA-ALC/NWIC 1651 First Street SE Kirtland Air Force Base NM 87117-5617	DSN: 246-9575 COMM: 505-846-9575 STU III: FAX: 505-846-4618 CFAX:
LANGDON, Stephen L	PLWSM 3550 Aberdeen Street SE, B-909 Kirtland Air Force Base NM 87117-5776	DSN: 246-9788 COMM: 505-846-9788 STU III: FAX: 505-846-4274 CFAX:
LANGER, Steven Maj, USAF	USSTRATCOM/J5231 901 SAC Boulevard Suite 118 Offutt Air Force Base NE 68113-6500	DSN: 271-3704 COMM: 402-294-3704 STU III: FAX: 402-294-1323 CFAX:
LEE, David M Maj, USAF	USSTRATCOM/J5232 901 SAC Boulevard Suite 118 Offutt Air Force Base NE 68113-6500	DSN: 271-2619 COMM: 402-294-2619 STU III: FAX: 402-294-1323 CFAX:
MANGENG, Carolyn	LANL Mail Station 5000 (Classified) Mail Station F630 PO Box 1663 Los Alamos NM 87545-1663	DSN: COMM: 505-667-3460 STU III: FAX: 505-665-4833 CFAX:
MCFEE, Ronald W	LANL Mail Station 5000 (Classified) Mail Station B220 PO Box 1663 Los Alamos NM 87545-1663	DSN: COMM: 505-667-1682 STU III: FAX: 505-665-4080 CFAX:

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7

ATTENDANCE LIST

9 DECEMBER 1993

NAME	ORGANIZATION	TELEPHONE
MORGAN, Michael Capt, USAF	HQ AFSPACECOM/DOMN 150 Vandenberg Street Suite 1105 Peterson Air Force Base CO 80914-4120	DSN: 692-5428 COMM: 719-554-5428 STU III: FAX: 719-554-5354 CFAX:
MULLINS, William Maj, USAF	SAF/AQQS(N) 1060 Air Force Pentagon Washington DC 20330-1060	DSN: 223-6303 COMM: 703-693-6303 STU III: FAX: 703-695-1022 CFAX:
MURPHY, K L	PLWSM 3550 Aberdeen Avenue SE, B-909 Kirtland Air Force Base NM 87117-5776	DSN: 246-0905 COMM: 505-846-0965 STU III: FAX: CFAX:
OISHI, Kazuo	SNL NM/5161 Mail Stop 0482 PO Box 5800 Albuquerque NM 87123-0482	DSN: 244-0159 COMM: 505-844-0159 STU III: FAX: 505-844-8745 CFAX:
RAFFERTY, J Michael	ORION International Technologies, Inc. 6501 Americas Parkway NE, Suite 200 Albuquerque NM 87110-5372	DSN: COMM: 505-881-2500 STU III: FAX: 505-881-5060 CFAX:
SOLBERG, James	SNL NM/2753 Mail Stop 0865 PO Box 5800 Albuquerque NM 87185-0865	DSN: 244-1135 COMM: 505-844-1135 STU III: FAX: 505-844-7857 CFAX:
TEDESCHI, William	SNL NM/5161 Mail Stop 0482 PO Box 5800 Albuquerque NM 87123-0482	DSN: COMM: 505-845-9851 STU III: FAX: 505-844-8745 CFAX:
VALVERDE, John T Maj, USAF	HQ AFSPACECOM/DOMN 150 Vandenberg Street Suite 1105 Peterson Air Force Base CO 80914-4120	DSN: 692-5995 COMM: 719-554-5995 STU III: FAX: 719-554-5354 CFAX:

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HIGH POWER RADIO FREQUENCY PHASE 2 STUDY GENERAL MEETING # 7

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9 DECEMBER 1993

NAME	ORGANIZATION	TELEPHONE
WEITEKAMP, Mark Maj, USAF	HQ DNA/RAES 6801 Telegraph Road Alexandria VA 22310-6801	DSN: 246-4823 COMM: 703-325-6622 STU III: FAX: 703-325-2959 CFAX:
WHITTED, Edward	LANL/TSA-5 Mail Station 5000 (Classified) Mail Station F602 PO Box 1663 Los Alamos NM 87545-1663	DSN: COMM: 505-665-0038 STU III: FAX: 505-665-2017 CFAX:

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**APPENDIX C
HPRF EWG MEMBERSHIP**

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**APPENDIX D
PROGRAM UPDATE**

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**APPENDIX E
SURETY WORKING GROUP REPORT**

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SURETY WORKING GROUP REPORT (U)

MEETING #7
SANDIA NATIONAL LABORATORIES/NM
DECEMBER 7-9, 1993

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M. R. ALLEN, SYSTEMS, [REDACTED] 12/2/93

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**Surety Working Group Report
HPRF Meeting # 7**

- The main business of SWG was conducted at an interim meeting on November 15-16 at SNL/NM
- The SWG met on Dec. 7 to review results of interim meeting
- Further Work on evaluating candidates for Nuclear Detonation Safety and Operational Safety is on hold pending more mature definition of warhead candidates
- Current efforts focus on development and evaluation of use control themes

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The work of the Surety Working group is divided into three areas: Operational Safety, Nuclear Detonation Safety, and Use Control.

The addressing of Use Controls is also new for land based missile systems. Because of the FARR study, it has become a timely issue for both DOD and DOE.

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The Surety Working Group met on November 15-16 at SNL/NM. The primary activity at that meeting was continued work on developing the assessment process for Operational Safety for the different warhead candidates. A first cut was also made at evaluation. Nuclear Detonation Safety and Use Control were addressed in sub-groups headed by Paul Rexroth, SNL 324, and Larry Moore SNL 5122, respectively. John Berry, SNL 324, will assume the Nuclear Detonation Safety sub-group chairmanship for future meetings.

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At the December 8 meeting of the SWG, the results of the November meeting were reviewed in presentations by J. F. Cuderman, John Berry, and Larry Moore.

Copies are attached of viewgraphs presented at the HPRF general meeting on December 10.

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SURETY WORKING GROUP REPORT

SUMMARY NOV. 15-16 MEETING, SNL/NM

- OPERATIONAL SAFETY
 - QFD PROCESS WAS CONTINUED
 - EVALUATION CRITERIA WERE REVIEWED
- NUCLEAR DETONATION SAFETY
 - PROCESS FOR REVIEWING CANDIDATE DESIGNS ESSENTIALLY COMPLETE
 - FIRST CUT AT EVALUATION (SEPT. GEN. MTG)
 - AWAITING FINAL WH CANDIDATE DESIGNS
- USE CONTROL
 - REQUIREMENTS/POLICY REVIEW COMPLETE
 - OVERALL APPROACH DEFINED
 - PRELIMINARY REVIEW OF MISSILE SYSTEMS/WARHEAD INTERFACES COMPLETED

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SWG RESPONSE TO RWG ACTION ITEMS

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ITEM 1-- LLCE interval determined by individual candidate design features. This information should come from the WDWG. The costing tradeoffs are a SEWG responsibility.

ITEM 2-- Safety system status verification appears to be an item which requires further discussion in the RWG. (1) DOE delivers WH in a safe state; Status is verified in two independent tests. (2) A status monitor can potentially be an unintended energy point of entry in adverse environments. It is my understanding that DOE does not concur that such verification is needed. (3) Current design proposals do not include enough detail to determine whether such verification is WH or missile issue.

ITEM 3-- It would not appear that the designs proposed would require any additional functional testing

ITEM 4-- The determination of intrinsic radiation levels of should be determined by the WDWG.

Item 5--

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**APPENDIX F
REQUIREMENTS WORKING GROUP REPORT**

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**APPENDIX G
SYSTEMS ENGINEERING WORKING GROUP REPORT**

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HPRF Phase 2 Study

*Systems Engineering Working
Group Status Reports (U)*

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**7 December 1993
HPRF Meeting #7
Sandia National Labs, NM**

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Minutes of the Systems Engineering Working Group Meeting
December 7, 1993, Sandia/NM

- Minuteman III Weapon System Information

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The status of the single RV (SRV) program, the guidance replacement program and the Peacekeeper program were discussed; a tentative schedule was presented. The SRV and GRP are still planned. The goals for both programs are to provide the capability for the de-MIRVing of the Minuteman III missiles to single Mk12 or Mk12As. The ability to place on Mk21 on the Minuteman III missile will not be precluded by either of these two changes. The placement of Mk21s on Minuteman III missiles remains a goal of the Air Force.

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- New Mexico Design Candidates:

Kaz Oishi (SNL/NM) summarized the issues that the SEWG must consider as we develop our surety concepts for the warhead candidates. Kaz also reviewed the discussions we have initiated with the Air Force (TRW/BMD and OOALC). He emphasized the need for continued cooperation as the SEWG works the problem of developing solutions to issues raised in the FARR study.

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Charles Chow (LLNL) summarized the use control concepts being considered for the California warhead candidates. The concepts selection are very preliminary and will evolve over the next few months.

is very preliminary

The work on this concept

All other designations (either carry over from the Phase I study or developed by other working groups) should be discontinued.

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• Response of Past Action Items

Frank Carrillo (SA-ALC) presented the Requirements Working Group responses to the action items requested by the SEWG at the last HPRF general meeting. Following some discussion, we revised our question regarding the radiation levels. The question was stated to request information specifically to the missile flight environments. What radiation levels must the HPRF warhead survive during launch, mid-flight and reentry. The information is primarily needed to establish the hardening level for the warhead electronics.

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Agenda
System Engineering Working Group
7 December 1993

- *MM III Review*
 - J. Hogan
- *NM Design Candidates*
 - M. Haertling
 - K. Oishi
 - W. Tedeschi
- *CA Design Candidates*
 - C. Chow
 - G. Strandin
 - J. Chan
 - M. Kniskern
- *Action Item Review*
 - F. Carrillo
 - J. Cuderman

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New Mexico Design Candidates (U)

M. Haertling

Los Alamos National Laboratory

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Action Items(U)

SEWG Responses to RWG

SEWG Action Items for WDWG

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**HPRF Warhead Phase 2 SEWG Meeting
8 December 1993
Sandia National Laboratory, Albuquerque NM**

AI 93-3-1 from SEWG to RWG

Provide status at next Systems Engineering Working Group on MCs' Use Control and STS' Radiation Environments requirements.

Suspense: October-November 1993 timeframe

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HPRF Warhead Phase 2 SEWG Meeting
8 December 1993
Sandia National Laboratory, Albuquerque NM

AI 93-3-1 from SEWG to RWG (cont)

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**HPRF Warhead Phase 2 SEWG Meeting
8 December 1993
Sandia National Laboratory, Albuquerque NM**

AI 93-3-1 from SEWG to RWG (cont)

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HPRF Warhead Phase 2 RWG Meeting

7 December 1993

Sandia National Laboratory, Albuquerque NM

Action Item to Warhead Design Working Group

Military Characteristic Paragraph 2.7.12 states, "The Intrinsic Radiation output from the Warhead shall be as low as reasonably achievable to minimize hazards to personnel during all phases of the STS. A desired goal is no more than TBD mrem/hr total with no more than TBD mrem/hr resulting from neutrons when measured at a distance of TBD meters from the centerline of the warhead. The DOE shall provide the DoD with details of the Intrinsic Radiation output of the Warhead."

Request the WDWG provide its recommendations to answer the TBDs.

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California Design Candidates (U)

C. Chow

Lawrence Livermore National Laboratory

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HPRF ϕ -2 Study Meeting #7

SEW G/SWG Meetings

Dec. 8, 1993

Charles T. S. Chow



LLNL

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This document contains Restricted Data as defined by the Atomic Energy Act of 1954. Unrestricted Security Information is identified by the Central Security Agency. Classified by 1027/2/83. Dec 1993

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Issues relative to use control enhancement-

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1. Incorporation of the imbedded use control (UC) features will require reworking: California baseline package is not certified with use control system in place.
2. It pays to take a look at the alternatives that can be more accommodating to modern or advanced UC features:

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Work in progress - to be reported to the next session:

1. UC concepts to be spelled out in more details: packaging layouts and block diagrams, etc.

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**HPRF System Engineering/Surety Working
Groups Meeting**

December 8, 1993

Gerald E. Strandin, Org. 5371

Sandia National Laboratories/California

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**APPENDIX H
MISSION ANALYSIS WORKING GROUP REPORT**

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**APPENDIX I
WARHEAD DESIGN WORKING GROUP REPORT**

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**Warhead Design Working Group:
LLNL Activities Status Report**

**Deborah Wojtowicz
Shawn Cantlin**

**High Power Radio Frequency Phase Two
Meeting # 7**

**Sandia National Laboratory
December 6-9, 1993**



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**Derivative Classifier:
Gene Burke Date: 11/10/93
F Group Leader, A Division**

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**APPENDIX J
VULNERABILITY WORKING GROUP REPORT**

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**HIGH POWER RADIO FREQUENCY
VULNERABILITY ANALYSIS WORKING GROUP MEETING #7**

7 DECEMBER 1993

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HIGH POWER RADIO FREQUENCY
VULNERABILITY ANALYSIS WORKING GROUP MEETING #7

I. (U)Introduction The High Power Radio Frequency (HPRF) Vulnerability Analysis Working Group (VAWG) meeting #7 was hosted by Sandia National Laboratories (SNL). It was held at their facilities on 7 December 1993.

A. (U)Administration Dr. Jerry Cuderman welcomed the attendees to SNL and provided basic administrative information. After stressing attention to the subject of dealing with classified discussions and materials he turned the meeting over to the VAWG meeting and identified the primary topics for discussion which would be covered before open discussion would be allowed.

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B. (U)Meeting Purpose Three primary agenda items were identified for this meeting of the HPRF VAWG. The first agenda item was to review the status of each of the participating laboratories test activities. Each of the test directors (SNL/Jim Solberg, LLNL/Mike Bland, PL/Sam Gutierrez, and LANL/Ken Calahan) was asked to provide status briefings. The second item was a presentation by Dr. Lynn Shaefer from LLNL.

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There had existed concerns during the last meeting that the new test data and its format would be incompatible with the techniques being used by the MAWG analysis.

C. (U)Attendance Representatives were present from each of the major DOE laboratories participating in the vulnerability analysis and testing. Also present were representatives from Air Force Phillips Laboratory, which is conducting the Air Forces portion of the vulnerability analysis and testing. Representatives from both HQ AFSPACECOM and USSTRATCOM also attended the meeting. One representative from US Army ARDEC attended as did the HPRF Phase 2 Study Director. A complete list of attendees is included as appendix A.

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II. (U)Discussion Topics The entirety of the morning was allocated to the test activity status reports from each of the laboratories.

No additional items were introduced during open discussions other than questions related to these three areas.

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A. (U) Test Program Status below is a summary of the status reports provided by each of the participating laboratories.

1. ~~SECRET~~ AF Phillips Laboratory.

2. ~~SECRET~~ Sandia National Laboratory. Jim Solberg briefed the status of the SNL test activities.

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~~SECRET~~ SNL plans to conduct two, possibly three more tests during the next year.

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Which of these systems are tested will depend on schedule, costs, and availability.

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3. ~~SECRET~~ Lawrence Livermore National Laboratory. Mike Bland provided LLNLs review of their test activities. LLNL has essentially been dormant during the last quarter of FY93 and the initial part of the first quarter since the majority of the tasks planned for FY 93 had been completed. ~~LLNL is currently conducting further~~ funding for this year.

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The specific equipment they plan to test has not been decided. This decision had been delayed in anticipation of an expansion of the target set to include tactical equipment. It was made clear by the STRATCOM and USSPACECOM representatives that they were still only interested in the target set initially define for this study, during the Phase 1.

4. ~~SECRET~~ Los Alamos National Laboratory. Although LANL has completely zeroed out all funds to support testing for HPRF support, Ken Calahan was able to attend this meeting. He provided a briefing on the recent testing he has completed under another related program.

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A single point failure was experience during a single event, however, this failure is believed to be a MTBF and not significant.

B. ~~UNCL~~ Technical Presentation The only technical presentation was presented by Dr. Lynn Shaefer from LLNL.

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Dr. Shaefer was asked to perform calculations using the specific yields of interest to our study.

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C. (U)VAWG/MAWG Interface

Two methods for data entry will be provided. The first will facilitate the entry of FAAT like data. The second will allow the entry of cross-sections or transfer functions from the test programs.

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III. Action Items

- A. (U)Old Action Items. NONE
- B. (U)New Action Items.

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IV. (U)Next Meeting. The next meeting of the VAWG will be in conjunction with the HPRF general meeting.

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LIST OF ATTENDEES

VWG MEETING 7 DEC 93

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE</u>
J.F. CUDERMAN	SNL/NM MS 0482	(505)844-8063
PHIL ANGELOTTI	US ARMY ARDEC	(201)724-5451
KEN CALAHAN	LANL/AOT-9 MSH851	(505)665-4297
MICHAEL BERNARDIN	LANL/X-5 MS B259	(505)667-1439
MICHAEL BLAND	LLNL/DSED L-153	(510)422-9882
JOE SEFCIK	LLNL/A	(510)423-0671 FAX: 423-0925
JIM SOLBERG	SNL/NM MS0865	(505)844-1135
WILLIAM TEDESCHI	SNL/NM, 5161, M50482	(505)845-9851 FAX: 845-8745
KEITH BAIRD	SA-ALC NWIC	(505)846-9575
MAJ JOHN VALVERDE	HQ AFSPACECOM/DOMN	(719)554-5995 DSN: 692-5995
MAJ STEVE LANGER	USSTRATCOM/J523	(402)294-3704
MAJ M. DAVID LEE	USSTRATCOM/J523	(402)294-2619 DSN: 271-2619
LT COL ROGER COLVIN	FCDNA/FCPRA	(505)846-8575
STEVEN L. LANGDON	PHILLIPS LAB/WSM	(505)846-9788
SAM GUTIERREZ	PHILLIPS LAB/WSM	(505)846-9787
KENNETH L. MURPHY	PHILLIPS LAB/WSM	(505)846-0965
D. LYNN SHAEFFER	LLNL	(510)422-2092
LT COL WALTER ATCHISON	FCDNA/FCPRA	(505)846-8584

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