Project AE - Weapon Safety and Operational Support (cont'd)

FY99

Continued the safety assessment of the B-52H aircraft.
Began B-2 Weapon System Safety Assessment (WSSA) at the request of the Air Force Safety Center.
Analyzed and quantified DOE Nuclear Detonation Safety Exceptions (NDSEs).
Conducted Fuel Fire Modeling and Testing to support ongoing WSSAs.
Developed a WSSA data base to archive completed WSSAs.
Began storage vault blast effects testing and analysis at the request of the Air Force Safety Center.
Began development of portable, mobile, and rapidly deployable radiation detection and measurement system comprised of remote sensor linked to central receiving/processing station via Radio Frequency (RF) signals.
Conducted Forces Support nuclear and WMD technical analyses as required by CINCs, Services, Joint Staff, OSD, and Nuclear Weapons Council (NWC) on force structure, weapons safety and security, theater missile defense, counterproliferation, planning, and international military and political security issues.
Completed WMD Threat Analyses for Aerial and Sea Ports of Debarkation for Strategic Air and Sea Lift.
Delivered the NATO Nuclear Planning Systems Training System prototype to Supreme Headquarters Allied Powers Europe (SHAPE).
Completed DTRA role in the development of the Air Vehicle Planning System project with transfer of the program to STRATCOM.
Completed the DTRA initial support effort for the Nuclear Target Data Feed project of NATO targeting support.
Completed deterrence framework analyses (China, INDO-PAK, Non-State Actors, Iraq) in support of requirements from STRATCOM, USFK/PACOM, CENTCOM, Assistant Secretary of Defense (ASD) (Strategy & Threat Reduction), ASD (Special Operations & Low-Intensity Conflict)(SOLIC), and Director, Counterproliferation Policy.
Completed coordination of and planning for USAFE Force-on-Force (FoF) exercise.
Completed planning support and asset allocation in support of AFSPACECOM/20th AF for ICBM Security engineering test plan.

Project AF - Weapon System Operability (cont'd)

Developed simulation and modeling of EMP Targeting of WMD, using coherent pulsed power and nuclear EMP Simulator Source based on air, land, and sea mobile platforms.

Upgraded STRATCOM C4 Assessment Tool (STRATCAT) tool set for STRATCOM and for Regional Commands specific C3I assessment mission requirements.

Upgraded the SREMP target assessment and planning system (SREMPTAPS), to include new and war-planners-required weapon design parameters.

Developed 3-D simulation of new Nuclear Weapon Effects (NWE) and Asymmetric Threat via SHYPS code, using the DoD high-performance computing (HPC) capability and in collaboration with Lawrence Livermore National Laboratory (LLNL).

U.S./Allied Survivability & Operability in Nuclear/Special Weapon Environments ($13,918K)

Initiated development of protection technologies for visible sensors for ballistic missile defense (BMD) and spacecraft applications.

Began development of system electronic controller chip to implement the Testable Hardware protocols on C4I and space-based infrared system (SBIRS) spacecraft and BMD missile/interceptors.

Initiated an assessment of the feasibility of using high-performance computing models to reduce design margins and test requirements.

Began an electronic tool kit to automate Testable Hardware protocol design capability for sensor, spacecraft, and missile interceptor developers.

Captured underground testing (UGT) thermal structural response (TSR) data for use in design and test methods.

Initiated the development of a survivability assessment tool to evaluate multiple element architectures to nuclear effects.

Began incorporation of a nuclear weapons effects module/database into warfighter Electronic Battlebook for assessments of the Integrated Tactical Warning and Attack Assessment (ITW/AA) by USSPACECOM and USSTRATCOM.

Successfully conducted two non-ideal airblast experiments to measure damage to heavy armored vehicles to support JCS updates to the Joint Nuclear Targeting Manual.

Completed development and assessment of low-level radiation standards and fly-away dosimetry system for NATO.

Project AF - Weapon System Operability (cont'd)

Deliver to program offices and government contractors an electronic tool kit to automate testable hardware protocol design capability for sensors, spacecraft, and missile/interceptors.

Deliver TSR design and test methods for use in the design of survivable sensors, missiles, interceptors and reentry vehicles/bodies.

Initiate assessment of the performance of BMD Family of Systems (FoS) in nuclear-disturbed environments.

Deliver a prototype nuclear weapons effects module/database for the Warfighter Electronic Battlebook for assessments of the ITW/AA by USSPACECOM and USSTRATCOM.

Conduct two non-ideal airblast experiments to measure damage to medium armored vehicles to support JCS updates to the Joint Nuclear Targeting Manual.

Demonstrate integrated EMP/HPM test methods, techniques, and technologies that produce improvements over existing electromagnetic protection methodologies.

Continue assessment and testing of critical national security assets.

Characterize the response of advanced detector technologies to radiation.

Upgrade non-upsettable processor controller for circumvention and recovery (C&R) for testable hardware protocol implementation.

Complete the development of TSR test methodology for application to weapon systems operating in nuclear environments.

Begin development of Airborne Nuclear Survey system with Army using existing Army Radiation Detection Indication and Computation (RADIACs).

Begin development of internal and biodosimetry functions of fly-away dosimetry lab.

Field-test and evaluate fly-away dosimetry system in scheduled nuclear weapons exercises.

Assess NMD/TMD nuclear survivability testing and validation plans.

Continue development and evaluation of radiation protection standards and risk measures applicable to equipment for NATO review.

Initiate conceptual development of battlefield radiological measurement system adapted to unmanned aerial vehicle (UAV) platform.

Project AG—Scientific Computations & Information Systems (cont'd)

Provided classified access capabilities.

Monitored and assessed circuit utilization and investigated new communication technologies.

Graybeard Project ($4,152K)

Continued Graybeard review, commentary and archival of perishable nuclear electronics/environmental test data, shock physics, for thermomechanical and biological effects data. Initiated Graybeard data capture of nuclear sources.

Continued review, commentary and archival of cratering, ejecta, dust and fallout test, nuclear effects test data for thin film, biological effects and transient radiation effects on electronics.

Accelerated Graybeard document review activities on ionization and electromagnetic (EM) effects.

Completed Graybeard free field airblast data commentary.

Continued incorporation of atmospheric and underground nuclear test data.

DASIAC (Information Analysis Center) ($3,158K)

Provided scientific and technical information services and products as the DoD-wide repository for test photos, films, data, test records and other information products, through operation of the Information Analysis Center.

Continued operation of web site, providing radiation response of electronic parts.

Disseminated Science and Technology Digest.

Application of Nuclear Weapons Expertise ($719K)

Drafted update of The Effects of Nuclear Weapons.

Reviewed draft Nuclear Weapon Effects textbook; continued drafting remaining chapters.

Completed and distributed Nuclear Effects Data Management and Analysis Systems and installed it on DARE and at UK's Atomic Weapons Establishment (AWE).

Completed validation of Advanced Numerical Methods. Compared results to precision test data.

Developed a 3D atmospheric code with column physics based on the Automatic Mesh Refinement (AMR) code.