

**The Post Cold War SIOP
and
Nuclear Warfare Planning:**

A Glossary, Abbreviations, and Acronyms

BY

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Introduction

On October 1st 1998, a new Single Integrated Operational Plan (SIOP-99) went into effect. The introduction of this new nuclear war plan is at once entirely routine and, at the same time, utterly remarkable. Despite the significant reductions in the number of nuclear warheads since the Reagan-Gorbachev thaw of the mid-1980s, START arms control negotiations, official Russian-American cooperative programs, missile “detargeting” agreements and other confidence building measures to reduce the likelihood of nuclear war, and the fact that Russia is no longer an adversary of the United States, the process of planning for large-scale nuclear war against Russia remains essentially unchanged.

In November 1997 President Clinton signed Presidential Decision Directive 60 (PDD-60) – the first new national nuclear employment policy guidance since 1981. Upon reflection we were struck by the continuing influence of the SIOP — the central nuclear war plan of the United States – and its dominance over American arms reduction policies and objectives. Why should the war plan, rather than the more fundamental interests of national security strategy and policy, determine the size, location, and alert levels of U.S. nuclear forces?

In 1996, as the Clinton Administration began a process to determine a lower level of strategic nuclear forces it could agree to in a future START III treaty, it was Pentagon nuclear planners and commanders who had the greatest influence on the internal deliberations. They argued that a level of some 2,500 “accountable” warheads (from the 3,500 in START II) would make it impossible for Strategic Command (STRATCOM) to comply with the existing national guidance on nuclear employment. In response the Administration basically changed the guidance to accommodate existing warfighting demands at lower levels, without changing the fundamental axioms that characterize the current SIOP. Some fanciful Cold War requirements for the United States to “prevail” in a protracted nuclear war were eliminated, but virtually every other aspect of nuclear warfighting doctrine was retained. The core of the nuclear war plan was basically unchanged, but fewer warheads could be accommodated, given the removal of a portion of Russian nuclear forces, improved weapons reliability and accuracy, and a new flexibility and adaptability in matching warheads with targets.

Despite the end of the Cold War, two features of the SIOP remain intact: it is perhaps the most secret document in our society and it is extraordinarily complex. Retired General George (“Lee”) Butler, former commander of Strategic Command, responsible for preparation of the SIOP at the end of the Cold War said:

“It was all Alice-in-Wonderland stuff . . . an almost unfathomable million lines of computer software code . . . typically reduced by military briefers to between 60 and 100 slides . . . presented in an hour or so to the handful of senior U.S. officials . . . cleared to hear it.”¹

Butler says that Presidents have only a superficial understanding of nuclear war

¹ R. Jeffrey Smith, “The Dissenter,” *The Washington Post Magazine*, December 7, 1997, p. 42.

planning and of the consequences of executing an attack. What is more, Congress is completely powerless in the face of the influence of required SIOP choreography in determining national security policy. Senator Dale Bumpers (D-AR) complained to Secretary of Defense Dick Cheney during the FY 1991 appropriations hearings of the impossibility of Congress discharging its constitutional mandate of oversight in light of the secrecy and complexity of the war plan:

"I don't see how this Committee can deal . . . with strategic technology and strategic weaponry and know, considering the choices—and that's what we're up against here, we're talking about choices and priorities—how can we do that without knowing what the SIOP is which is being crafted by a bunch of people—not just you and others – but an awful lot of people who never appear before this Subcommittee."²

Earlier this year, the NRDC Nuclear Program initiated a U.S. and Russian Nuclear War Plans Project to better understand the role of the SIOP in influencing arms control policy and disarmament. As a result of the lack of meaningful change in the Clinton Administration's PDD-60, we believe this is a need to reevaluate the influence of war fighting strategy and war planning.

Combining the large amount of information about the nuclear infrastructures of the former Soviet Union and the United States that is available with new software tools and computing power allows a non-governmental organization like NRDC to conduct a kind of analysis that has never previously been done outside of government. The SIOP itself can now be replicated, with real doctrines, actual forces and targets, incorporating some degree of sophisticated synergy and calculations of nuclear effects. Thus the public, the Congress, the administration, and the arms control community will be in a position to understand the actual war plan of the U.S. (and eventually Russia) and the resulting damage and casualties that might occur in a nuclear war. The exercise will allow a more meaningful evaluation of the course, pace and effects of arms reduction policies and initiatives.

As a first step to attempt to penetrate this highly secretive war plan, to try and understand its structure and logic and to decipher it, we have compiled a Glossary which provides the terms and language that the real war planners use. The glossary was written by NRDC consultant William M. Arkin and his colleague Hans Kristensen. It is based entirely on primary source documents from the Defense Department, Joint Chiefs of Staff, the Air Force and Navy, Strategic Command (STRATCOM), the former Strategic Air Command (SAC), the Defense Intelligence Agency (DIA), and the National Imagery and Mapping Agency (NIMA). Many of these documents have been released under the Freedom of Information Act to Mr. Arkin and Mr. Kristensen (and are noted as such).

The Glossary gives a sense of the closed world of SIOP planning and the enormous energy and effort that goes into the selection of targets, the choreography of nuclear war, and the estimation of various effects under highly variable conditions.

The Glossary consists of definitions followed by a list of acronyms. For some acronyms

² U.S. Congress, Senate Appropriations Defense Subcommittee, FY 1991 Defense Appropriations Hearing, 12 June 1990.

listed, there is no known definition. Some terms are only known by their acronym because the word equivalent is unknown. Since this a Working Paper, we welcome comments, corrections, and revisions. The Glossary will serve as the basis for a common terminology and will assist NRDC in the process of replicating the actual nuclear options planned by the U.S

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GLOSSARY

A card B card D card K card R card (ABDKR). Tape used to transfer SIOP data from the older TRIAD Computer System (TRICOMS) to the Command and Control Enterprise Database (C²EDB).

AC. Active work file database, a component of the Strategic Warfare Planning System.

ACEREP Msg. Allied Command Europe (ACE) Reporting System Message, used in nuclear weapons execution.

ACES STRATWAR. Global thermonuclear war training and education model introduced in March 1990 and used by the Air Force Wargaming Center, Maxwell AFB, AL. ACES STRATWAR is an automated, two-sided, nuclear planning and employment exercise format concentrating on decision-making relating to arms reduction negotiations, force deployment, targeting, and force execution. The code is unclassified.

ACM [Advanced Cruise Missile] Mission Analysis and Validation System (ACM MAVS). New STRATCOM system supporting Advanced Cruise Missile planning.

ACM [Advanced Cruise Missile] Mission Analysis Software (ACM MAS). New STRATCOM system supporting Advanced Cruise Missile planning.

ACM [Advanced Cruise Missile] Mission Planning System (ACM/MPS). Strategic Warfare Planning System tool that performs detailed cruise missile performance simulations as part of the cruise missile application process in SIOP planning.

acute dose. Radiation absorbed in a 24 hour period. SIOP planning assumes human effects of nuclear detonations based on the following:

- Exceeding 600 rads will cause death with two week for 100 percent of those exposed.
- Between 400 and 599 rads will cause death within 30 days for at least 50 percent of the exposed population. The remaining 50 percent is at least performance degraded.
- Between 200 and 499 rads will cause performance degradation for 100 percent of the exposed population.
- Between 75 and 199 rads will cause some radiation sickness but no significant performance degradation for the exposed population.
- Less than 75 rads will not adversely affect the exposed population.

(STRATCOM, "USSTRATCOM War Game Analysis Report for SIOP 98 (U), 5 September 1997, p. 1-3, partially declassified and released under the FOIA).

actual ground zero. The point on the surface of the earth at, or vertically below or above, the center of an actual nuclear detonation.

AD. Russian defensive forces file database, a component of the Strategic Warfare Planning System.

Adaptive Combat Environment System (ACES/Phoenix). Air Force aircraft and cruise missile

penetration and threat assessment model that integrates several existing SIOP planning models into a single architecture.

adaptive planning. 1. “Ad hoc” planning on newly identified targets, as well as the process of maintaining a pool of forces specifically reserved to strike previously unidentified targets (mobile or emerging targets). (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-6.) The JSCP Nuclear Supplement states that “adaptive planning will be a principle means of reserve force employment. It can occur either in the pre-, trans-, or post-MAO timeframe and involve either SIOP/NSNF [non-strategic nuclear forces] or Reserve forces.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. D-28, partially declassified and released under the FOIA). 2. Generally, a range of options, during deliberate planning that can be adapted to a crisis or situation as it develops. These options are sometimes referred to as Flexible Deterrent Options (FDOs). 3. A specific Adaptive Planning Option (APO) in the SIOP, particularly suited for employment of the Nuclear Reserve Force (NRF) after implementation of the Major Attack Option.

Ad Hoc Query (AHQ). A routine which allows users with a means to develop, save, and print tailored queries extracting data from the Joint Operations Planning and Execution System (JOPES) core database.

Advanced Campaign Effectiveness Model (ACE). Rockwell International developed SIOP analysis model, introduced in March 1987 (ACE-11) and December 1987 (the Sortie Evaluation (SORVAL) Postprocessor) to analyze the effectiveness of strategic bomber sortie penetrations of Soviet/Russian air defenses. Output is measured as either probability of survival or number of weapons on target. Weapons on target is measurable for fixed, planned, and strategic relocatable target missions. The code is unclassified.

Advanced Low Altitude Radar Model (ALARM). Research and evaluation planning tool implemented in July 1987, widely used in the Air Force and contractor world. ALARM evaluates the effectiveness of various aircraft configurations against selected air defenses. The code is unclassified. ALARM 88, implemented in 1989, incorporated low observable (stealth) considerations. Other versions incorporate terrain masking and site specific data.

Advanced Missile Model (AMM). Analysis model introduced in 1979 (and revised in 1990) that computes range and footprint capabilities for existing and future ballistic missile systems. It is used to apply a missile sortie laydown to a target set, create a timing plan accounting for fratricide considerations, and compute a variety of exchanges. The Nuclear Weapons Effects Model (NWEM) is incorporated. The code is unclassified.

AF. Aircraft/cruise missile file database, a component of the Strategic Warfare Planning System.

Afloat Planning System. Navy mission data planning system for the Tomahawk land-attack missile (TLAM).

afterwinds. Wind currents set up in the vicinity of a nuclear explosion directed toward the burst center, resulting from the updraft accompanying the rise of the fireball.

AI. Work Identifier Management Index (WID) database, a component of the Strategic Warfare Planning System.

aimpoint. 1. The target of an attack, particularly of a nuclear attack. 2. A point on the ground about which it is desired to center a conventional weapon impact(s) (DMPI) or a point on the ground desired for weapon impact (DPI). 3. A Strategic Warfare Planning System application (see AMPS).

Aim Point Construction Analysis. New STRATCOM system.

aimpoint graphic. NIMA reference cards built for aircrew use that contain reference data for radar fix points on the ground, including imagery of the fix points.

Aim Point System (AMPS). Part of the Intelligence Data Handling System (IDHS). (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. vi, partially declassified and released under FOIA).

Air Courses of Action Assessment Model (ACAAM). Generic force level assessment tool, developed by the Navy, that is used in SIOP planning.

Air Facilities Graphic (AFG). NIMA product replacing the Airfields and Seaplane Stations of the World database, and containing descriptive data about worldwide airfields.

Air Force Command and Control Network (AFC2N). External interface with the USSTRATCOM nuclear war planning system.

Air Force Mission Support System (AFMSS). Application used by the 608th Air Operations Group for bomber mission planning for the SIOP. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. xi, partially declassified and released under FOIA).

Air Target Chart (ATC). A display of pertinent air target intelligence on a specialized graphic base. The charts provide graphic overprint and textual data relative to radar return information and installations within the area. Air Target Charts are prepared at various scales and are produced under the Air Target Materials Program (ATMP) as a series of geographically integrated charts. There are 25 ATCs in a World Aeronautical Chart (WAC), each covering an area 72 nautical miles by 48 nautical miles. Two primary types of ATCs exist: Series 200 Air Target Charts (ATCs) and Series 200 European Air Target Charts (EATCs).

Air Target Materials Program (ATMP). Element of the Missile/Air Target Materials Program that provides for the production of medium- and large-scale map, chart, and geodetic products which support worldwide targeting requirements for visual and radar bombing operations. ATMP encompasses the determination of production and coverage requirements, standardization of products, establishment of production priorities and schedules, and the production, distribution, storage, and release/exchange of products included under it. The ATMP consists of the following products:

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- Series 200 Air Target Chart (ATC).
 - Series 1501 Joint Operations Graphic-Radar (JOG-R).
 - Series 200 European Air Target Chart (EATC).
 - Series 1501 European Joint Operations Graphic-Radar (EJOG-R).
 - Radar Fix Point Mini-Graphics.
 - Series 25 and 50 Urban Area Mosaics (UAM).
 - Installation Reference Point Graphics (IRPG).
 - Air Facilities Graphics (AFG).
 - Gridded Products (GP).

Air Target Mosaic. A large scale mosaic providing photographic coverage of an area and permitting comprehensive portrayal of pertinent target detail. These mosaics are used for intelligence study and in planning and briefing air operations associated with the SIOP and theater nuclear operations.

Air Vehicle Force Application System (AFAS). Main SIOP planning model for aircraft and cruise missiles. Also known as the Aircraft/Cruise Missile Force Application System, the Aircraft Force Application System, or the Aircraft Planning System (APS I & II). APS II is a Strategic Warfare Planning System application, under development, to develop a new tool for aircraft planning that integrates the Automated Routing and Maintenance System (ARMS), tanker mating and ranging from the SIOP Mating and Ranging Program (SMARP), penetration analysis from the Route Analysis and Penetration Evaluation System (ROPES), and provides an interface with the B-2 Aircraft Planning System (AFAS-ADDS). APS-I is managed by GDE/Logicon. The vendors are Ornetix, Central Point Software, Canon, Clarionet, Colorado Memory Systems, Greenleaf Software, US West, Everex Systems, Inc, Corel, MetraByte, Lifeboat Publishing, Oracle, and Intersolv, Inc.

Air Vehicle Planning System (AVPS). Application used by STRATCOM in SIOP war planning.

Airborne Command Post (ABNCP). The STRATCOM airborne command post, also known as the National Airborne Operations Center (NAOC).

Airborne SIOP Reconnaissance Plan (ASRP). Plan formulated to provide the NCA and STRATCOM battle staff with trans- and post-SIOP damage assessments.

airburst. 1. An explosion of a bomb or projectile above the surface, as distinguished from an explosion on contact with the surface or after penetration. 2. (Nuclear) The explosion of a nuclear weapon above the surface at such a height that the maximum radius of the fireball does not touch the Earth's surface, as distinguished from an explosion on contact with the surface or after penetration.

aircraft application. A subset of the traditional functional stage of SIOP preparation following weapon allocation. The steps in aircraft application are: assignment of a group of DGZs to a specific aircraft; development of the aircraft route from the main operating base to the post-strike recovery base, association of weapons to the DGZs, and optimization of the route taking into consideration defenses, fuel, weapon accuracy and characteristics and tactics. For tanker aircraft, routing and scheduling is also performed. For reconnaissance aircraft, route planning is

performed to optimize achievement of post-strike collection requirements. See allocation.

Aircraft planning system (APS). See Air Vehicle Force Application System. Sometimes also referred to as the Air Vehicle Planning System. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. xi, partially declassified and released under FOIA).

Airfields and Seaplane Stations of the World. Air Force database and supplemental information about worldwide airfields. Superseded by the Air Facilities Graphic (AFG), a NIMA product.

ALCM [Air-launched Cruise Missile] Mission Analysis and Validation System (ALCM MAVS). New STRATCOM system supporting Air-launched Cruise Missile planning.

ALCM [Air-launched Cruise Missile] Mission Analysis Software (ALCM MAVS). New STRATCOM system supporting Air-launched Cruise Missile planning.

ALCM [Air-launched Cruise Missile] Mission Planning System (AMPS). Strategic Warfare Planning System tool that performs detailed cruise missile performance simulations as part of the cruise missile application process. Has no capability south of the equator.

Allied Command Europe (ACE) desired ground zero (DGZ) number (AND). Identifying scheme – similar to BE numbers – for targets designated in NATO nuclear operations plans.

Allocated Windows Planning System (AWPS). Strategic Warfare Planning System Enterprise Database (SWPS-EDB) tool that allocates weapon systems to targets to achieve damage expectancy thresholds and performs analysis and quality review of the SIOP during plan build and maintenance. Sometimes also referred to as the Allocation Weapons Planning System. AWPS is a pre-processor to Automated SIOP Allocation (ASA). Under SWPS modernization, the Warrior and FAS/CIVIC programs are being integrated into AWPS as modules. AWPS was used in 1997 for the first time as a part of SIOP 99 allocation, and was scheduled for full use in the SIOP 99 Major Attack Option (MAO) Quality Review scheduled for March 1998. AWPS includes RAINGR, Minuteman III Operational Targeting Program (MOTP3), PDCALC (Probability of Damage Calculator), and URAP. The system is managed by Logicon. Vendors include Microsoft, Oracle, CDI, IBM, Delta Technologies, 5th Generation Systems, Western Digital, On Track, Phoenix Computer, Everex Systems, Inc., Unisys, and Access Softek.

allocation. 1. In general, the distribution of limited resources among competing requirements for employment. These are referred to as allocation of air sorties, nuclear weapons, etc. (Joint Pub 1-02) 2. (Nuclear) "The apportionment of specific numbers and types of nuclear weapons to a commander for a stated time period as a planning factor for use in the development of war plans." (Joint Pub 1-02) In SIOP construction, the stage of allocation traditionally includes matching delivery vehicles and weapons (taking into consideration operational constraints such as launch patrol areas, fratricide, weapon reentry angles, and cruise missile ranges) with DGZs, national guidance, time sensitivity, and damage expectancy estimates. "The allocation step in SIOP development requires considerable judgement in balancing characteristics of DGZs such as time sensitivity, location, hardness, priority, defenses, purity, and coverage requirements with

weapon system attributes as range, yield, circular error probable (CEP), footprint size, responsiveness and survivability.” (STRATCOM, Strategic Planning Study, Final Report, p. 5-41). Under the Strategic Warfare Planning System modernization program, allocation is being incorporated into a new function called assignment.

AN. The WINDS database, a component of the Strategic Warfare Planning System. See WINDS.

Analytical Photogrammetric Positioning System (APPS). A stereo photogrammetric work station used in conjunction with a Point Positioning Data Base for precise point positioning. See also Point Positioning Data Base (PPDB).

annex. A document appended to an operation order or operations plan to make it clearer or to give further details.

Annex F changes. Daily changes to the SIOP on forces and levels of readiness to keep commands and databases current.

Annotated Image Graphic. An image annotated with imagery exploitation results (e.g., target materials, basic reference graphics briefing boards/transparencies, etc.).

AP. Parametric database, a component of the Strategic Warfare Planning System.

application. The process of fusing target, weapon system, and warhead types into specific options for the employment of nuclear weapons.

Applied Missile Applications (A101X). New STRATCOM system.

Applied Weapon. Strategic Warfare Planning System application.

Applied Weapons Analysis (N206B). New STRATCOM system.

Arc Digitized Raster Graphics (ADRG). Digital raster representations of paper graphic products. Maps/charts are converted into digital data by raster scanning and transforming the map image into the Equal Arc Second Raster Chart/Map (ARC) System frame of reference. Used for electronic map displays. See also Controlled Image Base (CIB).

Architecture 95. STRATCOM project to transition primary intelligence support for the command from a large mainframe host processor to a DOD standard based client/server environment. Architecture 95 was scheduled for completion by the end of FY 1997. Post Architecture 95 projects include compatibility with the Defense Intelligence Agency Joint Intelligence Virtual Architecture (JIVA), Defense Information Infrastructure (DII) transition, and Defense Messaging System (DMS) implementation.

area limitation products. Multispectral based and other imagery products, special purpose charts depicting potential strategic relocatable target (SRT) deployment areas and studies and reports analyzing actual and potential SRT operations and tactics.

area target. 1. A large area usually composed of multiple elements or components. 2. Any target that is not a point target. In SIOP targeting parlance, there are three categories of area targets: Broad Area Search (BAS), Directed Search Area (DSA), and Lines of Communication (LOC).

Arsenal Exchange Model (AEM). Aggregated, two-sided strategic force exchange model with a diverse set of scenarios and analyst controls used to analyze alternative force structures for future budgets or arms control agreements, nuclear policy support, etc. AEM is used along with FROBAK (the Front-end/Back-end Processor) and the ORCA Planning and Utility System (OPUS) to produce the Red Integrated Strategic Operations Plan (RISOP). Originally implemented in 1965, it was updated in 1974. It is used by JCS/J8, STRATCOM, and other users. Each side had a set of rules for the deployment of weapons (e.g., ICBMs only against silos, SLBMs against factories). FROBAK is used to reduce the size of the overall target base and well as to process damage estimates. The output is expected damage, target coverage, arriving weapons, as well as other measures of effectiveness. It is maintained by ABM Services. The code is unclassified. See also ORCA Planning and Utility System (OPUS).

AS. Aircraft source sortie file database, a component of the Strategic Warfare Planning System.

assignment. 1. A specified number of complete nuclear weapons authorized for expenditure by a commander. An assignment may be made for a specific period of time, for a phase of an operation, or to accomplish a particular mission. 2. Commitment of a particular weapon system or systems against a particular target. 3. A newly created functional stage of SIOP preparation following DGZ construction that combines the older stages of allocation, application and timing and deconfliction into a single process.

AT. SIOP timing and production file database, a component of the Strategic Warfare Planning System. IDMS component for SIOP Timing and Production (STP). (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. 5-3, partially declassified and released under FOIA).

attack option. See option.

Attrition Analysis (N208). New STRATCOM system.

Automated Air Facility Intelligence File (AAFIF). Top Secret/SIOP/ESI Strategic Warfare Planning System software system that processes and maintains data obtained from NIMA to be used in the production of the SIOP. Sometimes also referred to as the Automated Air Facilities Information Files. The AAFIF input files contain all current airport and runway information. The list is the source by which planners designate the final takeoff and landing points for the SIOP application. The worldwide airfield installation information both supplements and adds to the information in the Integrated Database/Modernized Integrated Database (IDB/MIDB). The AAFIF includes information on approximately 5,000 active airfields in the former Soviet Union, China, Eastern Europe, and North Korea, and another 36,000 active airfields in the rest of the world, including friendly countries. Included are details on the runway, taxiways, parking, facilities, services, installations, logistics, operator and users. Order of battle and airfield

illustrations are included. See also DAFIF (Digitized Air Facility Intelligence File).

Automated Emergency Action Message Processing and Dissemination System (AEPDS). Joint Staff directed program, originally intended to form part of the REACT system to automatically decode emergency action messages authorizing the use of nuclear weapons or other changes in nuclear weapons status. The program was terminated on 3 January 1992. (SAC, *91 SAC Command History*, p. 115, partially declassified and released under the FOIA).

Automated Installation Intelligence File (AIF). DIA-maintained database, being phased out and replaced by the Integrated Database/Modernized Integrated Database (IDB/MIDB), and containing the JCS-directed Target Intelligence Program. During the Cold War, the AIF covered nearly every known installation or place of potential significance, both active and inactive, for military operations. The database allowed for the storage, manipulation and retrieval of vast quantities of installation data, containing worldwide coverage of facilities in every target category. The format includes the following headings: country code, basic encyclopedia (BE) number, target data inventory (TDI) category, geographic coordinates, installation name, significance, activity code, and intelligence cutoff date. The significance code was derived from another database: the Geographic Installation Intelligence Production Specifications (GIIPS). At its height, the AIF consisted of some seven reels of magnetic tapes which listed approximately 440,000 installations worldwide. (USAF Intelligence Targeting Handbook, 20 July 1981, p. 3-9, partially declassified and released under the FOIA). Associated installation databases include the Basic Encyclopedia (BE), the Base Program, the Integrated Database/Modernized Integrated Database (formerly the Target Data Inventory), the Contingency Planning Facilities List (CPFL), and the Future Target List (FTL).

Automated Routing and Maintenance System (ARMS). Strategic Warfare Planning System planning tool for B-1, B-2, and B-52 bombers, ACMs and ALCMs, and gravity bombs. ARMS uses the JD database of SWPS, which contains the National DGZ List (NDL) that is maintained by the NDL Integrated Development System (NIDS). It plans specific bomber missions from designated entry points along the Russian/former Soviet border through targets to recovery points, and cruise missiles from launch points to targets. ARMS include an attrition and penetration subsystem which allows an auto-router to select the bomber route with the highest probability of success, taking into consideration air defenses, fighter aircraft and attrition, and radar terrain masking. ARMS has no capability south of the equator. The vendors are Zenith Data Systems, Ashton Tate, Borland International, Oracle, DEC, Microsoft, Lifeboat Publishing, and Quarterdeck.

Automated SIOP Allocation (ASA). Strategic Warfare Planning System application, a planning tool used to allocate all aircraft, cruise missile, ICBM, and SLBM weapons to specific targets. ASA integrates damage functions and allows improved aircraft accessibility and Probability of Arrival (PA) planning, including the use of target polygons, cruise missile launch points, and exclusion circles. Vendors include Precision, Sage Software, Intersolv, Inc, Unisys, Pioneer, Quarterdeck, Borland International, CDI, TRW, Oracle, and Sun.

Automated Tactical Target Graphic (ATTG). Standard tactical target materials (TTM) item that has been largely replaced by the Basic Target Graphic (BTG). ATTGs provide aerial photographic coverage—annotated vertical or oblique imagery—of a target and a limited area

surrounding it at a scale permitting optimum identification of detail. The ATTG also provides textual intelligence on a sheet separate from the graphic portion. ATTGs cover single targets and come in two forms: a lithographic sheet and a miniaturized version of an aperture card. First produced in 1971, ATTGs were a total installation database recognized as a desirable method of recording target data. Though they have been replaced by the Basic Target Graphic, some are still used, particularly in areas of the world with lower priorities.

Automated Target Tie-up (ATT) Program. Canceled deconfliction tool that was intended to be used for planning large scale bomber missions and operations.

Automated Weaponing Optimization Program (AWOP). Conventional weaponing program.

AV. Cruise missile (ALCM/ACM) avoidance area file database, a component of the Strategic Warfare Planning System.

AW. Air Vehicle Force Application System (AFAS) work file database (aircraft and cruise missile), a component of the Strategic Warfare Planning System.

B-2 Aircraft Planning System (AFAS-ADDS). Strategic Warfare Planning System application. See Air Vehicle Force Application System (AFAS).

Basic Attack Option (BAO). A SIOP attack option, no longer believed to be used, and replacing Regional Nuclear Options (RNOs), that included the target subset primarily of Soviet conventional forces, with the emphasis of nuclear attacks to thwart regional power projection, either into Western Europe, Turkey and Thrace, or China.

Basic Encyclopedia (BE). 1. A compendium of installation intelligence taken from the Modernized Integrated Database (MIDB) and the most inclusive of all installation lists. It describes every identified installation with an active function or of valid interest to intelligence agencies, particularly to the operational and planning staffs of the Unified commands. The BE contains basic data on the identification, location, and function of each installation. It may be used to select potential fixed targets for employment of ground, sea, or air weapons, or to identify installations (such as public utilities and hospitals) to be withheld from attack. The BE covers all areas of the world except the United States and lists installations in five geographic areas: Eurasia; Western Europe; Latin America and the Atlantic; Middle East and Africa; and Southeast Asia and the Western Pacific. In 1989, the BE listed approximately 425,000 installations. (USAF Intelligence Targeting Handbook, 20 July 1981, p. 7-1, partially declassified and released under the FOIA). Also called the "Bombing Encyclopedia." See BE Number.

basic plan. The part of an operations plan that forms the base for annexes and appendixes. It consists of general statements about the situation, mission, execution, administration and logistics, and command and control.

Basic Target Graphic (BTG). Standard target graphic introduced in 1990 to replace the Automated Tactical Target Graphic (ATTG). The BTG is the standard general purpose

imagery-based product used to delineate and describe the elements of a target/installation to support a wide range of target related functions. It provides a photographic database divided into two sections: the graphic page(s), which shows the target facility; and the text page, which provides detailed information on the target. The BTG contains imagery for orientation and target identification, plus additional imagery as available, with annotations for critical components. The information is all-source, derived from satellite imagery, general and signals intelligence data, and MC&G data. The specific content of each BTG is determined by essential elements of information (EIs) developed for the functional category code of the target to which the BTG belongs.

BTGs can consist of several graphic pages to provide more detailed visual references. An orientation graphic provides small-scale imagery to aid in orientation and relative location of the target. A target or detail graphic is used primarily for positive target identification and clearly shows all components of a target. Unannotated graphics are added to the BTG at the producer's discretion to provide a clear view of the target graphic. An overall map view depicting the precise target location (on a JOG or topographic map) may be included in lieu of broad area coverage. Supplemental data and graphic sheets associated with the BTG include the Enhanced Target Graphic (ETG), Infrared Target Graphic (ITG), Radar Target Graphic (RTG), Seasonal Target Graphic (STG), Hard Target Graphic (HTG), and the Positional Data Graphic (PDG).

battle damage assessment (BDA). The determination of the effect of attacks on targets, generally referring to overall effects, not individual effects (which are often called bomb damage assessment).

battlestaff. Term referring to the officers (and enlisted personnel) in ground, airborne, and mobile command centers responsible for execution of the SIOP and other contingency plans.

BE Number. A 10 character number unique to each fixed installation (e.g., BE#0000X00000). The first 4 characters identify the world area code (WAC) number where the installation is located. The next 6 spaces are for the installation number, which consists of either six numeric characters, one alpha and five numeric characters, or two alpha and four numeric characters. The fifth and sixth spaces serving as identifying agency codes. Most installations are identified by BE number utilizing a zero in the fifth character position (for output convenience, this translates to a hyphen to facilitate reading the BE number (e.g., BE#0000-00000)).

Standard BE numbers are assigned sequentially from 000001 through 007999, 010000 through 017999, and 020000 through 027999. The exceptions are airfields and electronic sites. Airfields (functional classification code category 80XXX) are numbered sequentially from 008000 through 008999 and 088000 through 088999. Electronic (non-communications radar and other) sites (functional classification code category 85XXX) are composed of the WAC number and an E in the fifth character position, followed by a five-digit installation number. BE numbers for urban areas (functional classification code category 70100), cities (functional classification code category 70210), towns (functional classification code category 70220), and geographic positions (functional classification code category 70100) are assigned in descending sequence from 009999 through 009000 and 099999 through 099000 as may be required to accommodate more than 1,000 places in a single WAC. When a BE number is deleted from the database, it is never reused to identify another installation. See Functional classification code category.

blast. The predominant immediate effect of a nuclear explosion, and causing most of the physical damage. The destructive effects of a blast wave are produced both by overpressure (crushing effect) and dynamic pressure (drag effect). Both effects are expressed in pounds per square inch (PSI). Overpressure (p) is the amount by which the static pressure of the blast wave exceeds normal pressure. Dynamic pressure (q) is associated with the mass motion of air in the blast wave. It is like a strong wind striking a stationary object. Impulse is one of the primary measures of blast effects in nuclear weapons. It is a measure of the average pressure and the time during which the pressure acts. Damage inflicted on a target by a blast wave is generally a complex function of peak overpressure, peak dynamic pressure, pulse duration, and target structural response characteristics.

Blast Damage. Strategic Warfare Planning System application.

blast line. A horizontal radial line on the surface of the earth originating at ground zero on which measurements of blast from an explosion are taken.

bomb damage assessment (BDA). In general, the determination of the effect of attacks on targets. For nuclear warfare, the term is battle damage assessment.

bomb impact plot. A graphic representation of the target area, usually a pre-strike air photograph, on which prominent dots are plotted to mark the impact or detonation points of bombs dropped on a specific bombing attack. Usually refers to conventional bombing.

bombing errors. 1. circular error: The radius of a circle, with a center at a desired mean point of impact, which contains half the weapons independently aimed to hit the desired mean point of impact. 2. deflection error: Half the distance between two lines, drawn parallel to the aircraft's track and equidistant from the mean point of impact, which contains half the weapons independently aimed to hit the desired mean point of impact.

bomb release point. The point at which bombs must be released to reach the desired point of detonation.

breakaway. The onset of a condition in which the shock front moves away from the exterior of the expanding fireball produced by the explosion of a nuclear weapon.

Bridge Effectiveness Index (BEI). Joint Munitions Effectiveness Manual (JMEM) criteria for conventional weapons.

buffer distance. The vertical distance which is added to the fallout safe height of burst in order to determine a desired height of burst which will provide the desired assurance that militarily significant fallout will not occur. It is normally expressed in multiples of the vertical error.

Bulwark Bronze. STRATCOM SIOP-related exercise.

Buzzsaw. Legacy SIOP software program of unknown purpose.

C4ISR Year 2000 Study. STRATCOM study which examined the future requirements for Command, Control, Communication, Computers, and Intelligence. The study was approved by STRATCOM CINC General Habiger in May 1997. The primary theme of the recommendations was the need for better warfighting capability through better Automated Information System (AIS) integration and interoperability. The study has resulted in renewed emphasis on integration of war planning tools. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA)," Version 98.1.0, 15 August 1998, p. 3-3, partially declassified and released under FOIA).

category. See functional classification code category.

Census Bureau/Urban Polygons (CBURP). System that provides the capability to load Urban Polygon data into the Strategic War Planning Systems Enterprise Database (SWPS-EDB) and update that data with current Census Bureau information. The DIA creates the Urban Polygon data. SIOP planners convert the data into a common database available to other systems such as the NDL Integrated Development System (NIDS) Target Planning System. These applications need to display data graphically as urban polygons.

circular error. An error associated with delivery of munitions on a target. It is the distance measured between the desired and actual points of impact of a munition.

Circular Error Probable (CEP). 1. An indicator of the delivery accuracy of a weapon system, used as a factor in determining probable damage to a target. It is the radius of a circle within which half of the missiles or projectiles are expected to fall. 2. An indicator of the accuracy of a missile or projectile, used as a factor in determining probable damage to a target. It is the radius of a circle within which half of the missiles or projectiles are expected to fall. 3. A measure of aiming accuracy expressed in feet. Its value is estimated by the radius of a circle, with its center at the mean point of impact containing half of the impact points of independently aimed bombs or half of the mean points of impact (MPI) resulting from independent aiming operations. The circular error probable is associated with the circular normal distribution with an aiming error standard deviation equal to 0.849 CEP and is a meaningful measure of accuracy if the impact pattern is reasonably circular. As the pattern becomes more elliptical, Deflection Error Probable (DEP) and Range Error Probable (REP) become more accurate descriptions of the pattern.

Civilian Vulnerability Indicator Code (CIVIC). Nuclear blast and fallout effects program, part of the Strategic Warfare Planning System. CIVIC is a mathematical model portraying blast and fallout effects on specific targets using specific weapons. CIVIC is to be integrated as a module of AWPS to provide an interactive analysis capability for both SIOP development and maintenance. The program itself is in the process of being upgraded to enhance some of the weapons effects. See also FAS/CIVIC.

COLISEUM (Community On-Line Intel System for End-Users and Managers). DIA online intelligence system used by the unified commands (e.g., ACOM, CENTCOM, EUCOM, SOCOM, SOUTHCOM, STRATCOM, and TRANSCOM).

collateral damage. (Nuclear) Unavoidable or unintended effects from the use of nuclear weapons. Collateral damage constraints in the SIOP are set by the employment purposes and

desired effects on the target as specified in the Nuclear Weapons Employment Policy (NUWEP) and the Joint Strategic Capabilities Plan (JSCP). The JSCP Nuclear Supplement defines collateral as as “damage inflicted on installations not targeted in the execution option or not objective to the DGZ being evaluated for bombing.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-8, partially declassified and released under the FOIA.)

“Nuclear Weapons Employment Effects Data” (Joint Pub 3-12.2), prepared by the Joint Staff, provides “avoidance tables” to calculate collateral damage. Collateral damage considerations in the use of non-strategic nuclear forces includes “dangers to friendly forces, civilians, and nonmilitary related facilities, creation of obstacles, and residual radiation contamination. ... Collateral damage can be reduced by dividing a large target into several small ones and using smaller weapons rather than one large one.” (JCS, *Doctrine for Joint Theater Nuclear Operations*, Joint Pub 3-12.1, p. III-2.)

combat assessment. (Nuclear) The analysis of the effects of nuclear strikes to determine if the required effects were achieved. This is composed of two segments, battle damage assessment (BDA) and reattack.

Combat Mission Folder (CMF). The actual bomber mission folder which gives individual mission assignments in accordance with SIOP options. Aircraft receive the data via the Mission Data Preparation System (MDPS).

Combined Mating and Ranging Planning System (CMARP). Strategic Warfare Planning System model, originally delivered to SAC in 1983 (and enhanced annually by Logicon) used to support air refueling operations and exercises. CMARPS provides tanker force capabilities and requirements information from single sortie to full-force and is used for conventional and non-SIOP option planning. The code is unclassified. Vendors include Sysgen, Inc., Excelan, Inc., Novell, Horizons Technology, Reference Tech, and Laser Tool Corp.

Combined timing and resolution (CT&R) (A101H). Strategic Warfare Planning System application slated to be eliminated.

COMIREX Automated Management System (CAMS). Satellite imagery-related database.

Command and Control Enterprise Database (C²-EDB). Provides the single integrated database environment for the STRATCOM Command Center Support System (CCSS), including support for the Strategic C⁴I Outage Reporting & Evaluation System (SCORES), Readiness Evaluation, Assessment and Decision-making Information System (READI), the Global Command and Control System (GCCS), and Strategic Force Accounting Module (SFAM) systems. SIOP data is received from the Strategic Warfare Planning System Enterprise Database (SWPS-EDB).

Command and Control Enterprise Database SGS (C²EDB-SGS). Top Secret SIOP/ESI multilevel security database environment for the STRATCOM Command Center Support System (CCSS). Includes support for the Strategic Force Accounting Module (SFAM) system.

command and control system. The facilities, equipment, communications, procedures, and

personnel essential to a commander for planning, directing, and controlling operations of assigned forces pursuant to the missions assigned. (Joint Pub 1-02)

Command Center Processing and Display System Replacement (CCPDS-R). STRATCOM subsystem effort to update and replace the command center equipment used to process and display operational information for battle management with the main command post. Vendors include Hewlett Packard, hDC Computer Corp., Suncom Tech, Bridge Comm, Matrox, Image-In, Data Technologies, Powersoft, Sybase, and Informix Software.

Command, Control, and Communications Modeling (A072). STRATCOM system.

command, control, communications, and computer systems. Integrated systems of doctrine, procedures, organizational structures, personnel, equipment, facilities, and communications designed to support a commander's exercise of command and control across the range of military operations. Also called C⁴ systems.

Command Data Buffer (CDB). Minuteman III control system providing the missiles with remote targeting capability. The missile crew can remotely target from the launch control center by selecting from among four prestored target sets or by transferring new targeting data from the launch control center (LCC) to the desired slot(s) at the launch facility. The Minuteman III has the capability to access 2,400 execution plans. The expanded execution plan (EEP) program provides that expanded execution capability. (AFSPC, "Rapid Execution and Combat Targeting (REACT) System Operational Requirements Document," 15 March 1994, partially declassified and released under the FOIA).

Common Cruise Missile Mission Analysis System (A101B). New STRATCOM system.

Common Operational Picture (COP). Used in Deliberate/Crisis Action Planning for limited nuclear options. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. iv, partially declassified and released under FOIA).

Compliance Monitoring & Tracking System (CMTS). On-site Inspection Agency (OSIA) controlled treaty monitoring and inspection related information system.

Compressed ARC Digitized Raster Graphics (CADRG). Mapping products maintained by the National Imagery and Mapping Agency (NIMA) for assisting nuclear war planning. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. vi, partially declassified and released under FOIA). See also ARC Digitized Raster Graphics (ADRG).

Consequences of Execution (C of E). SIOP analysis function undertaken after a completed plan has been developed. "Consequences of Execution (C of E) is an expected value analysis that provides damage assessments, including physical damage, fatalities, population at risk from prompt and delayed nuclear effects, force attrition, targeting regrets and the degree to which the plan meets guidance." (STRATCOM, Strategic Planning Study, Final Report, p. 3-49). The C of E data is used to produce the Revision Report to the JCS and for preparation of the

Presidential Decision Handbook.

The JSCP Nuclear Supplement defines C of E as “an evaluation which examines attack options and planning assumptions against a range of most representative values or approved planning factors and technical parameters (e.g., pre-launch survivability, weapon system reliability, weapon yield, and VNTK [vulnerability number]) and that estimates damage expectancies and expected fatalities for all preplanned SIOP attack options.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-8, partially declassified and released under the FOIA.)

C of E analysis is based on average values of planning factors approved by CINCSTRAT before the SIOP planning cycle begins. These average values are used in mathematical formulae, leading to a single prediction of the effects of the SIOP execution based on planning factors. According to STRATCOM, this “deterministic” analysis is simpler and quicker than wargaming and tends to generate the same prediction each time the formula is used. (STRATCOM, “USSTRATCOM War Game Analysis Report for SIOP 97 (U), 13 July 1996, pp. 1, 1-1, partially declassified and released under the FOIA.)

Consolidated Air Defense Order of Battle/Generated Defense Order of Battle (CADOB/GENDOB). Top Secret SIOP/ESI application that loads the Strategic War Planning Systems Enterprise Database (SWPS-EDB) with DIA defensive data about facilities and equipment in Russia and the former Soviet Union. DIA sends the information to STRATCOM J2, which sends the CADOB to the J5 Directorate via the electronic interface with Strategic Warfare Planning System and the Intelligence Data Handling System (IDHS-90) EISI Link. GENDOB is currently transmitted on a nine track tape. The CADOB/GENDOB application then processes the data and uploads it to the SWPS-EDB. The data is used to plan sorties in the SIOP.

The CADOB/GENDOB client/server modernization program will integrate the system into the STRATCOM IDHS.

constraint. “A targeting limitation in which certain target categories are prohibited from attack for reasons of national policy.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-8, partially declassified and released under the FOIA). See also withhold.

contingency plan. A plan for major contingencies that can reasonably be anticipated. The Joint Strategic Capabilities Plan (JSCP), prepared by the Joint Chiefs of Staff, specifies the contingencies that unified commands must prepare plans for, including the SIOP and non-strategic nuclear operations. See also joint operation planning.

contingency planning. The development of plans for potential crises involving military requirements that can reasonably be expected in an area of responsibility. Contingency planning can occur anywhere within the operational continuum from peace to conflict and war and may be performed deliberately or under crisis action conditions. Contingency planning for joint operations is coordinated at the national level by assigning planning tasks and relationships among the combatant commanders and apportioning or allocating to them the forces and resources available to accomplish those tasks. Commanders throughout the unified chain of

command may give their staffs and subordinate commands additional contingency planning tasks beyond those specified at the national level to ensure broader contingency coverage.

Contingency Planning Facilities List (CPFL). A joint Defense Intelligence Agency (DIA)/regional unified command program for the production and maintenance of target documentation for select countries of contingency planning interest. The CPFL as such forms the basis for the non-Russian/former Soviet Union versions of the National Target Base (NTB). In 1989, the CPFL contained approximately 50,000 installations, including targets in Eastern Europe, China, North Korea, and the Middle East. (USAF Intelligence Targeting Handbook, 20 July 1981, p. 7-1, partially declassified and released under the FOIA).

Contingency Planning Guidance (CPG). Secretary of Defense-produced document, generally accompanying the Defense Planning Guidance (DPG), which provides the Joint Chiefs of Staff with overall policy direction in their contingency planning. Through the CPG, the Secretary fulfills his statutory duty to provide annual written policy guidance for contingency planning. The CPG is approved by the President after coordination with the Chairman, JCS. The CPG focuses the guidance provided in the National Military Strategy (NMS) and the DPG for specific tasking in the Joint Strategic Capabilities Plan (JSCP), which is prepared by the JCS.

Controlled Image Base (CIB). Unclassified panchromatic (black and white) digital imagery produced to support a variety of mission planning and command, control, communications, and intelligence systems. CIB is a compressed and National Imagery Transmission Format Standard (NITFS) compliant outgrowth of ARC Digital Raster Imagery (ADRI). CIB will initially be produced from SPOT commercial imagery that has been orthonormalized using Digital Terrain Elevation Data Level 1 (DTED1); it will eventually be produced from stereo imagery that has been orthorectified to remove relief displacements and other sources of positional error.

CONUS Airborne Reconnaissance for Damage Assessment (CARDAs). Post-SIOP execution contingency planning and reporting in the United States of damage from nuclear strikes.

conventional forces. One of four target categories in the "four-category targeting strategy," including headquarters installations, barracks, supply depots, marshalling points, conventional airfields, ammunition storage facilities, and tank and vehicle storage yards. Also sometimes called Other Military Targets (OMTs). See also nuclear forces, leadership, economic and industrial targets.

Counter Measure/Counter Measure Application Appendix (A101E). Strategic Warfare Planning System application slated to be eliminated.

counterforce. "Counterforce targeting is a strategy to employ forces to destroy, or render impotent, military capabilities of an enemy force. Typical counterforce targets include bomber bases, ballistic missile submarine bases, ICBM silos, antiballistic and air defense installations, C² centers, and WMD [weapons of mass destruction] storage facilities." (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-5.)

Counterproliferation Analysis Planning System (CAPS). Nuclear planning system used by STRATCOM and SOCOM relating to the selection of non-Russian and Chinese targets

associated with weapons of mass destruction.

countervalue. “Countervalue targeting strategy directs the destruction or neutralization of selected enemy military and military-related activities, such as industries, resources, and/or institutions that contribute to the enemy’s ability to wage war.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-5). “Countervalue targeting involves holding enemy cities, industry, and other economic resources at risk. *Destruction of these targets would mean not only significant casualties in the short run, but also the long-term degradation of the society.* If the goal of the U.S. is to significantly affect a country’s development, it can do so through striking the infrastructure or primary sources of national income. This might include such things as harbors, industrial centers, oil pipelines, or hydroelectric dams. Targeteers must understand what is truly important to a country before selecting targets.” (“Nuclear Operations,” Air Force Doctrine Document 2-1.5, 15 December 1997 (Draft), emphasis in original).

Crater Diameter (DC). Joint Munitions Effectiveness Manual (JMEM) criteria for conventional weapons.

Crisis Action Notice (CAN). Strategic Warfare Planning System planning document.

Critical Elements of Selected Generic Installations (DDB-2800-2-YR). DIA publication that provides a description of the common characteristics of various target types and critical nodes.

critical mobile target (CMT). Targeting term for mobile target. See also strategic relocatable target (SRT).

critical nodal analysis. The identification of key nodes in a target system, such as electrical power, to optimize attacks with fewer weapons. Nodal analysis focuses on the interaction and interrelationships among multiple target systems to determine the degree and points of their interdependence, as well as the linkage of their activities. The analysis focuses on the activities to be affected by attack, not on the characteristics of individual targets. The objective is to determine the most effective way to influence or affect the target systems with the minimum number of weapons expended. Systems for critical node analysis include RAILS and the Relocatable Target Assessment and Planning System (RTAPS).

crosstargeting. “The layering of weapons from different delivery platforms to increase the probability of weapon arrival and the confidence in damaging the target to the specified level.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-9, partially declassified and released under the FOIA). Using “different platforms for employment against one target to increase the probability of at least one weapon arriving at that target. Using different delivery platforms such as ICBMs, SLBMs, or aircraft-delivered weapons increases the probability of achieving the desired damage or target coverage.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-6.)

cruise missile application. A sub-function of aircraft application including the following steps: determine the route from the launch point to the target, selecting Terrain Contour Matching (TERCOM) maps for each missile; optimize the cruise missile route taking into consideration defenses, fuel, weapon accuracy, clobber and height of burst; and perform geometry analysis.

Cruise Missile Support Activity (CMSA). Tomahawk-related land-based main mission planning activity located at Atlantic and Pacific Commands (ACOM and PACOM) headquarters.

CT. Combined timing file database, a component of the Strategic Warfare Planning System.

damage criteria. (Nuclear) “Damage criteria are standards identifying specific levels of destruction or materiel damage required for a particular target category. These criteria are normally levied on the executing commander by higher authority, in accordance with national strategy and policy. These criteria vary for the intensity of the damage and also vary by particular target category, class, or type. ... Damage criteria, based on the nature of the target (size, hardness, mobility) as well as its proximity to military or nonmilitary assets, provide a means by which to determine how best to strike particular targets and, following the attack, to evaluate whether the target or target sets received the amount of damage required to meet operational objectives.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-6.)

damage expectancy (DE). “The probability that a weapon will arrive, detonate, and achieve at least a specified level of damage (severe or moderate) against a given target. DE is a function of both probability of arrival (PA) and the probability of damage (PD) of a weapon.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-9, partially declassified and released under the FOIA).

DART. Research and evaluation tool to assess the pre-launch survivability of non-strategic nuclear forces at the theater and local levels. The DNA model was introduced in 1988.

Data Transfer Unit Cartridge (DTUC). Actual SIOP routing and targeting instructions transmitted to individual bombers to carry out mission assignments. Aircraft receive the data via the Mission Data Preparation System (MDPS).

Data Version Mover (DV Mover). Top Secret SIOP/ESI Strategic Warfare Planning System database utility that moves data reliably from database to database in support of SIOP mission planning.

Defense IEMATS Replacement Command and Control Terminal (DIRECT). Console used for the processing and receipt of Emergency Action Messages (EAMs). See also IEMATS (Improved Emergency Message Automated Transmission System).

deflection error. An error associated with delivery of munitions on a target. It is the distance measured between an imaginary line drawn through the desired point of impact and an imaginary line drawn through the actual point of impact, both lines drawn parallel to the axis of attack.

Defense Information Systems Agency (DISA). The “Nuclear C³ Systems Engineer,” its mission is to provide technical advice, assistance, and analysis to the Chairman of the Joint Chiefs of Staff, services, CINCs, and defense agencies on nuclear command, control, and communication (C³) planning, assessment (including communication system reliability planning factors), system engineering, test and evaluation, and other support for nuclear decision-making and execution of war plans (including termination) throughout the entire spectrum of nuclear conflict.

DISA also provides population data for countries not included in the SIOP or NRF options, for cities exceeding 25,000 as well as “rural cell data.” Finally, in conjunction with DIA, DISA provides counter C³ warhead and high-altitude burst (HAB) allocation and electronic warfare threat prediction to the Director, J-8, for use in RISOP development. (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, pp. H-11, H-12, partially declassified and released under the FOIA).

Defense Intelligence Threat Data System (DITDS). DIA system used by ACOM, EUCOM, SOCOM and STRATCOM. The Modernized DITDS (MDITDS) is slated to replace DITDS in FY 1998, after which DITDS will be eliminated.

Defense Special Weapons Agency (DSWA). Defense agency, now incorporated into the new Defense Threat Reduction Agency (DTRA), that provides advice and assistance to the Chairman of the Joint Chiefs of Staff, services, CINCs, and defense agencies on various matters concerning nuclear weapons and nuclear weapons employment planning, including:

- Nuclear weapons effects on weapon systems and forces.
- Analysis of nuclear weapons planning and employment options.
- Technical analysis, studies, research, and development of software to improve the application, employment, and effectiveness of nuclear weapons and weapon systems.
- The effect of technology on nuclear force structure, operations, and politico-military constraints.
- Provide nuclear effects models and data, hardening technology, test support, and system survivability assessments for use by the Nuclear C³ System Engineer (DISA).
- In coordination with STRATCOM, continue to pursue and evaluate measures of effectiveness that support SIOP option planning.

(CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, pp. H-12 and H-13, partially declassified and released under the FOIA).

Deflection Error Probable (DEP). 1. A value equal to half the distance between two imaginary lines which are drawn parallel to the aircraft’s track, equidistant from the desired point of impact, and contain half the impact points of independently aimed weapons. 2. A measure of aiming accuracy expressed in feet. Its value is estimated by half the distance between two lines, drawn parallel to the aircraft’s track, that are equidistant from the desired mean point of impact and contain half the impact points resulting from independent aiming operations. If the impact pattern is bivariate normal as is usual, the aiming error standard deviation is equal to 1.483 DEP.

Deletes, Adds, and Changes List (DACHL). SIOP maintenance process tool, part of the Strategic Warfare Planning System.

deliberate planning. 1. The Joint Operation Planning and Execution System (JOPES) process involving the development of joint operation plans for contingencies identified in joint strategic planning documents. Conducted principally in peacetime, deliberate planning is accomplished in prescribed cycles that complement other Department of Defense planning cycles in accordance with the formally established Joint Strategic Planning System (JSPS). 2. A planning process for the deployment and employment of apportioned forces and resources that occurs in

response to a hypothetical situation. Deliberate planners rely heavily on assumptions regarding the circumstances that will exist when the plan is executed. See also Joint Operation Planning and Execution System.

deployable team. SIOP-mandated mobile teams to support airborne assets (bombers, tankers and reconnaissance aircraft) in the trans- and post-attack phase of a nuclear war (e.g., Strategic Aircraft Reconstitution Team (SART), Bomber Recovery Team (BRT), Tanker Recovery Team (TRT), STRATCOM Mobile Consolidated Command Center (STRATCOM MCCC), Forward Located Alert Generation (FLAG), National Airborne Operations Center (NAOC), and Dispersal).

Designated Reserve Force (DRF). See also Secure Reserve Force/Strategic Reserve Force (SRF).

Desired Ground Zero (DGZ). Also called designated ground zero. 1. The point on the surface of the earth at, or vertically above or below, the center of a planned nuclear detonation. 2. An aimpoint determined by evaluating the physical vulnerability, function, relative worth, spatial relationships, yield-CEP-height of burst spectrum, desired damage level, and constraints against collateral damage. The radii, combined with installation value and function, are used to determine groups of targets to be attacked by individual weapons in the SIOP. See DGZ construction.

Desired Mean Point of Impact (DMPI). Conventional weapons aimpoint (the actual point at a target designated to be hit).

Desired Point of Impact (DPI). Conventional weapons aimpoint for a single weapon.

deviation. 1. The distance by which a point of impact or burst misses the target. 2. The angular difference between magnetic and compass headings.

DGZ construction. A functional stage of SIOP preparation that follows target development and involves grouping installations in the National Target Base (NTB) into aimpoints, coding the aimpoints for weapon assignment (allocation), and compiling the coded aimpoints into the National DGZ List (NDL). “DGZ construction is a highly automated batch process that synthesizes installation data, policy and guidance, and weapons data to build aimpoints that best obtain the desired levels of damage against objective installations. The process manipulates data to produce DGZs that provide the minimum weapon that achieves guidance-directed probability of damage (PD) against individual installations or groups of installations. The process also generates damage effects tables for all weapons and codes the aimpoints based on national guidance.” (STRATCOM, Strategic Planning Study, Final Report, pp. 3-40 and 3-41) For SIOP-94, DGZ construction was accomplished in four weeks. See also desired ground zero.

DGZ Tree Generation (TREGEN). Nuclear Planning and Execution System (NPES) DGZ construction tool—a form of M3DACHLR—that is not as capable as the current tools in the NDL Integrated Development System (NIDS).

Digital Bathymetric Database (DBDB). Database maintained by the National Imagery and

Mapping Agency (NIMA) for assisting nuclear war planning. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. vi, partially declassified and released under FOIA).

Digital Chart of the World. A comprehensive 1:1,000,000 scale vector base map of the world, prepared by NIMA. DCW is the first product employing the Vector Product Standard (VPS). It includes all the information found on the base map for the Operational Navigational Chart (ONC) Series. Application software is provided to allow data base queries by feature/attribute or spatial selection. Data output is to hard disk, text file, or plot file. This is the largest scale unclassified map series in existence that provides consistent, continuous global coverage of essential base map features. The database contains more than 1,500 megabytes of vector data and is organized into 17 thematic layers. The data includes major road and rail networks, major hydrologic drainage systems, major utility networks, all major airports, elevation contours, coastlines international boundaries and populated places. The DCW also has an index of geographic names to aid in locating areas of interest.

Digital Feature Analysis Data (DFAD). A standard NIMA database product that supports radar return simulation, navigation and terrain obstruction studies. DFAD consists of selected natural and cultural planimetric features, type classified as point, line, or area features as a function of their composition and size. It portrays major natural and man-made features on the Earth's surface; the features and associated attributes of which are generally of radar reflectance significance. Content is derived from both cartographic and photogrammetric source material. Each feature is assigned a code and further described with limited attribution. The data are stored in polygon format and segregated into one degree tiles. When combined with DTED, an off-line database is created for use by simulators needing line-of-sight, obstruction, and perspective views. DFAD may also be used for sensor correlation, target recognition, lines of communication analysis, or for map production activities.

Digital Integrated Air Defense System (DIADS). Being used to upgrade the EADSIM program to include low observables.

Digital Point Positioning Data Base (DPPDB). A raster-scanned digital rendition of the current analog Point Positioning Data Base (PPDB) product.

Digital Terrain Elevation Data (DTED). 1. Digital elevation data used to plan cruise missile missions and support other applications, including line-of-sight analyses, terrain profiling, 3-D terrain visualization, mission planning/rehearsal, and modeling and simulation. DTED is a static database that contains terrain data, and the AD Strategic Warfare Planning System database, which contains defense data used in aircraft and cruise missile planning. DTED was originally developed in the 1970s to support aircraft radar simulation and prediction. It is a standard NIMA product that provides medium resolution, quantitative data in a digital format for military system applications that require terrain elevation. DTED Level 1 has a post spacing of three seconds or 100 meters. DTED Level 2 has a post spacing of one second or 30 meters. 2. Digital Terrain Elevation Data (DTED)/Terrain Contour Matching (TERCOM). Strategic Warfare Planning System application.

Digitized Air Facility Intelligence File (DAFIF). Modernized version of the NIMA flight

information database (Air Facility Intelligence File) containing airport, runway, navigational aid, and enroute data. Both the high altitude (18,000 feet and above) and low altitude (below 18,000 feet) enroute structures are included. Also known as Digital Aeronautical Flight Information File.

Directed Planning Option (DPO). A SIOP attack option reserved for scenarios that have not been anticipated in advance in Major Attack Option (MAO)/Nuclear Reserve Force (NRF) plan preparation.

dispersal site. An area or installation used by forces during periods of alert, mobilization, or armed conflict to reduce vulnerability to detection and/or attack. This concept is particularly used for both strategic and non-strategic nuclear and nuclear-support aircraft.

document production. The final stage of SIOP preparation. On the basis of the plan, the force providers (ACC for bombers and reconnaissance aircraft, ACOM for Atlantic submarines, PACOM for Pacific submarines, SPACECOM for ICBMs, and TRANSCOM for aerial refuelers) receive a set of force requirements, including commit lists, generation timing, and degrade lists, to designate those assets that are committed or anticipated as necessary for SIOP execution. The degrade lists tell the providers the priority of the provided forces.

Document Production System (DPS). Strategic Warfare Planning System application that produces the external documents needed for distribution in support of ICBM, SLBM, aircraft, and NATO SIOP missions. DPS produces over 50 types of user-defined reports and queries. DPS is managed by SAIC. Vendors include DFI, Microsoft, Asymetrix, Netscape, NetFactory, Inc., Network Systems, Emulex, Quyen Systems, Inc., and Novell.

dose index. The total expected dose for the unprotected population at a selected monitor point, adjusted for wind and radiation correlation among target areas. (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. G-4, partially declassified and released under the FOIA).

DT. Digital Terrain Elevation Data (DTED) management file database, a component of the Strategic Warfare Planning System.

dual-capable aircraft (DCA). Refers to those non-strategic aircraft (e.g., F-15E, F-16, allied Tornado) that are nuclear capable and certified.

Dual-Capable Aircraft Aimpoint Selection (DCAAPS). Nuclear planning system tool used by STRATCOM and the regional unified commands. DCAAPS incorporates casualty functionality into DGZ construction, required for planning non-strategic nuclear operations in accordance with national guidance.

DUG. Legacy SIOP production software.

DUPCOM. SIOP production system for reproducing two-man controlled targeting tapes for the ICBM and bomber force. The legacy program was originally supplied to SAC in the early 1970's.

DY. Dynamic component file database, a component of the Strategic Warfare Planning System .

dynamic pressure. Pressure resulting from some medium in motion, such as the air following a shock front of a blast wave.

EAM Generator (EAMGEN). The Emergency Action Message Generator (EAMGEN) program is a DOS-based Ada program provided to the airborne battlestaffs and Nuclear Planning and Execution System (NPES) command centers to convert Nuclear Execution Reporting Plan (NEREP) messages into STRATCOM Emergency Action Messages (EAM). The code is Top Secret. The vendors include Alsys, Inc., Novell, and Hummingbird. EAMGEN is not expected to change and may also be replaced by NPES functionality.

earth penetrating weapons (EPW). A weapon optimized through aerodynamic design and fusing to penetrate into the earth before detonation. The B61-11 bomb, carried by the B-2 bomber, is the only true earth penetrating weapon available for SIOP planning.

economic analysis (EA). Function of SIOP targeting and preparation involving characterization and selection of economic and industrial targets.

economic and industrial targets. One of four target categories in the "four-category targeting strategy," including war-supporting industry and industry that contributes to economic recovery. War-supporting industry includes the nuclear infrastructure, factories involved in the production of nuclear weapons, ammunition factories, conventional weapons production factories, petroleum refineries, railroad yards and repair facilities. Industry that contributes to economic recovery include coal, basic steel, aluminum, cement, and electric power. See also nuclear forces, leadership, and conventional forces.

Effective Protection Factor (EPF). A value assigned to the fallout protection realized by a population through the use of available shelters. It is a function of shelter radiation transmission factors, distribution of population among the shelters, and time spent inside them." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-10, partially declassified and released under the FOIA).

effects. See nuclear effects.

Electromagnetic Pulse (EMP). A sharp pulse of radio-frequency (long wavelength) electromagnetic radiation produced when a nuclear explosion occurs in an unsymmetrical environment, especially at or near the earth's surface or at high altitudes. The intense electric and magnetic fields can damage unprotected electrical and electronic equipment over a large area.

electromagnetic radiation propagation. The emission or transmission of wave energy; gamma radiation; x-rays; visible, infrared, and ultraviolet radiation; and radar and radio transmissions.

Electronic Chart Updating Manual (ECHUM). Manual maintained by the National Imagery and Mapping Agency (NIMA) for assisting nuclear war planning.

Electronic Order of Battle (EOB). A standard listing of non-communications electronic devices including site designation, nomenclature, location, site function, and any other pertinent information obtained from any source that has military significance when related to the devices. The EOB tracks all radars and other emitting electronic devices of military significance, including airborne and seaborne devices.

EM-1. Short name for the *Handbook of Nuclear Weapons Effects*, a massive effects manual prepared and kept updated by the Defense Special Weapons Agency.

Emergency Action Message (EAM). The specific message, coded and authenticated, that is transmitted to nuclear command centers and nuclear forces to implement war plans, arm, and fire nuclear weapons.

Emergency Action Procedures (EAP). The JCS-specified procedures, applicable mostly to command centers (fixed and mobile) specifying how contingency plans must be implemented, and the various control, reporting, and administrative procedures to be followed.

emergent targets. “Even after the initial laydown of nuclear weapons, there may be a residual requirement to strike additional (follow on and/or emerging) targets in support of retaliatory or war-termination objectives. Commanders must maintain the capability to rapidly strike previously unidentified or newly emerging targets.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-6.) See also adaptive planning.

employment. The strategic, operational, or tactical use of forces.

Employment Mating and Ranging Program (EMARP). System used to allocate and schedule tankers to refuel aircraft.

energy network. “That segment of a nation’s industrial base (including production and distribution) that provides energy in the form of electricity, petroleum, and natural gas required to support the rest of the industrial economic base, military operations, and the general population.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-10, partially declassified and released under the FOIA).

Enterprise Database (EDB). See Strategic Warfare Planning System Enterprise Database (SWPS-EDB).

escalation control. “The concept of limiting the level, scope, duration or intensity of a conflict with the objective of terminating the crisis/war at the lowest level of conflict possible and on terms favorable to the United States.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-11, partially declassified and released under the FOIA).

Event Sequence Processor (ESP). Computer simulation previously used by the JSTPS to conduct SIOP war gaming. The ESP predicted a range of possible results for each planned SIOP

execution. It predicted two essential events for each SIOP weapon evaluated: 1. arrival and detonation in the target area; and 2. damage to installations near the detonation. Effective with SIOP 98 (1 October 1996), STRATCOM began using a new simulation for these predictions, called the Strategic Offense-Defense Simulation (SODSIM). (STRATCOM, "USSTRATCOM War Game Analysis Report For SIOP 97 (U)," 13 July 1996, p. 1-2, partially declassified and released under the FOIA).

exclusion circle.

Execution Plan Program (EEP/EPP). SIOP legacy production system software originally designed by Logicon and used by Minuteman III and Peacekeeper missiles to calculate computer verification memory checks (CVMCs) which are used to validate targeting and execution plan data input into the missile's weapon system.

Execution planning. A stage of SIOP targeting that prepares input for and supports the actual tasking, construction, and subsequent execution by weapon systems. Input includes data concerning the target, weaponeering calculations, employment parameters, and tactics.

expected dose. "The predicted unprotected radiation does at a selective monitor point resulting from a specific nuclear detonation." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-11, partially declassified and released under the FOIA).

Extended Air Defense Simulation (EADSIM). Strategic Warfare Planning System Enterprise Database (SWPS-EDB) model, first introduced in 1989, and designed to evaluate effectiveness and efficiency of weapons against targets, and primarily used for conventional warfare scenarios. EADSIM is an air defense, theater level simulation used to assess the effectiveness of air defense scenarios, from one vs. few to campaign (force-on-force) level. The scenarios include surface-to-air missiles, surface-to-surface missiles, ballistic missiles, cruise missiles, and aircraft. IAS will be used as the interface between EADSIM and SWPS-EDB. EADSIM is managed by Teledyne-Brown. The code is unclassified. The vendors include Novell. See also Extended Air Defense Simulation Preprocessors (PREP).

EADSIM is being updated to include better support for low observable air vehicles. The Digital Integrated Air Defense System (DIADS) will be the interface to provide high fidelity command and control modeling.

Extended Air Defense Simulation Preprocessors (PREP). Extension of the Extended Air Defense Simulation (EADSIM) program, under development.

Extended Integrated Database (XIDB). See Modernized Integrated Database/Integrated Database (MIDB/IDB).

Extremely Sensitive Information (ESI). Classification caveat associated with SIOP planning and targeting information, usually expressed as Top Secret SIOP/ESI. Different categories of SIOP data (from Category 0 to 10) designate further compartments for access to information.

Face lift. Bomber-related term.

Facility Identification Element (FIE). Identifying element of a target composed of the suffix and functional classification code.

fallout. The precipitation to earth of radioactive particulate matter from a nuclear cloud; also applied to the particulate matter itself.

Fallout Assessment System/Civilian Vulnerability Indicator Code (FAS/CIVIC). Top Secret SIOP/ESI Strategic Warfare Planning System application which calculates facility damage, fatality and casualty estimates, and radiation levels for SIOP reports, war games analysis, and crisis action planning; creates fallout dose and dose rate plot files for graphic representation of fallout; and computes facility blast damage expectancy using “successful” weapons files for war game analysis. CIVIC calculates target installation damage, fatality/casualty estimates, and radiation dose levels. The program integrates Newfall, Toras, and PDCALC. It receives information from WINDS and DTED ADRG. The FAS/CIVIC replacement and maintenance program is a new project scheduled for the FY 1999-2000 time frame. The FAS/CIVIC model will be reengineered to enhance transportability, ease of operability, and incorporate updated algorithms, transport codes, languages and methodologies, to be incorporated into the SWPS-EDB. The program is managed by SAIC. Vendors include Symantec Corp., Borland International, Oracle, and Microsoft.

fallout prediction. An estimate, made before and immediately after a nuclear detonation, of the location and intensity of military significant quantities of radioactivity.

fallout safe height of burst. The height of burst at or above which no military significant fallout will be produced as a result of a nuclear weapon detonation.

fallout wind vector plot. 1. A wind vector based on the wind structure from the earth’s surface to the highest altitude affecting fallout pattern. 2. A wind vector diagram based on the wind structure from the earth’s surface to the highest altitude of interest.

Fatality Assessment (N206D). STRATCOM system.

FATS (fatalities). 1. Damage calculation measurement tool used in SIOP planning. 2. “Deaths produced by the short-term effects of nuclear detonations.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-11, partially declassified and released under the FOIA).

footprint (FTPRT). See OASIS/FTPRT (Operations Analysis Strategic Interactive Simulator/Footprint).

footprinting. Steps in the process of footprinting includes: missile footprint generation, which identifies candidate target tie-ups; footprint accessibility checks to validate the target tie-ups; a series of footprint enhancements to achieve optimum footprinting; fratricide avoidance modeling; and an examination of the launch patrol areas to determine the feasibility of ballistic missile submarine patrol areas.

force application. See application.

Force Element Terminal. STRATCOM system.

force generation (FORGEN). Strategic nuclear forces report that is part of the Nuclear Planning and Execution System (NPES) and the Nuclear Execution Reporting Plan (NEREP).

Forward Located Alert Generation (FLAG). SIOP-mandated mobile team involved in preparation of dispersal bases for bomber and tanker relocation during generated alert.

“four-category targeting strategy”. Common term describing the main SIOP target categories: Nuclear forces, military and political leadership, conventional forces (also known as other military targets), and economic and industrial targets. See nuclear forces, leadership, conventional forces, economic and industrial targets.

fratricide. Intra-sortie fratricide is resolved during the application process. Inter-sortie fratricide is resolved during timing and deconfliction.

Fratricide Build (Fratbuild). Top Secret SIOP/ESI Strategic Warfare Planning System application that supports production of SIOP mission planning data sets used to model the effects of nuclear detonations. Fratbuild is used by timing and deconfliction software to prevent aircraft and missile fratricide.

Front-end/Back-end Processors for the AEM (FROBACK). Arsenal Exchange Model pre- and post-processor, introduced in 1986, and used to model strategic offensive and defensive forces exchanges, particularly in production of the RISOP. FROBAK is a series of five modules (Prober, DGZer, Dagger, Deval, and Postal) developed to expand the AEM allocation model to allow for the treatment of detailed target data and operational constraints. It is maintained by ABM Services. The code is unclassified. Vendors include Microsoft. See also ORCA Planning and Utility System (OPUS).

FULCRUM. Application on the NTB Workstation.

functional classification code. Intelligence Data Handling System (IDHS) hierarchical functional code associated with target categories, and used in construction of BE numbers. Each installation is classified or categorized to reflect products and military activity supported, etc. They are categorized by a five-digit code, the first digit gives the function in nine major categories. The other four digits show functions within the group. From left to right, each one describes the function or capability of the installation more specifically. A code is assigned to each fixed facility that has some significance. The functional code for a mobile system (e.g., SAM, AAA, GCI, etc.) is assigned to the specific area that the system supports or where the activity is located (rather than the equipment itself). EXAMPLE: 80052 Airfield, fighter base, primary mission is support of ground attack aircraft.

Known categories, by type:

- ABM site (Category 875X1)
- Air defense installations (Categories 82XXX and 87XXX)..

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- Airfield (Category 80XXX).
 - Airfield underground/cave support facilities (Category 864XX).
 - Arctic staging base (Category 80030).
 - Assembly and staging area (Category 902XX).
 - Bridges (Category 44100 and 45100).
 - Chemical weapons (Category 661XX).
 - Cities/towns (Category 702XX).
 - Command post bunker (Category 8224X).
 - Communications facilities, transmission and reception (Category 41XXX).
 - Cruise missile site (Category 8715X).
 - Dams (Category 43900).
 - Defensive missile sites/complexes (Categories 872XX, 873XX, and 875XX).
 - Desalination facilities (Category 43110).
 - Electrical power generating plants and distribution facilities (Category 42XXX and 61XXX).
 - Ground force headquarters (Categories 910XX and 911XX)
 - Ground forces materiel repair and storage depot (Category 920XX).
 - Heliport (Category 80150).
 - Inland locks and canals (Category 46120).
 - Lines of Communication, railroad (Category 45700).
 - Lines of Communication, highway (Category 44700).
 - Missile systems (Categories 841XX, 87XXX, and 881XX).
 - Missile launch complex (Categories 876X0, 876X2, and 876X8).
 - Missile Support Facilities for Ship-borne or Coastal Defense Missiles (bunkers) (Category 879X1).
 - Multipurpose switching center (Category 41430).
 - National, Combined and Joint Command (Category 89XXX).
 - Naval ammunition storage (Category 97200).
 - Naval bases (Category 951XX).
 - Nuclear power electrical generating facility (Category 42140).
 - Nuclear Weapons storage site (Category 604XX).
 - Offensive (surface-to-surface) missile sites (Category 88XXX).
 - Piers and docks (Category 44400).
 - POL Storage (Category 218XX).
 - Population concentration (Categories 702XX and 75100).
 - Radio relay terminal (Category 41121).
 - Railroad tracks and yards (Category 45XXX).
 - Railroad/highway bridge (Categories 45120 and 44120).
 - Railroad/highway crossing a dam (Categories 44530 and 45500).
 - Radar sites (Category 85XXX).
 - Refineries and other oil installations (Category 21XXX).
 - Satellite ground station (Category 4114X).
 - Shipbuilding yard (Category 67100).
 - Semiconductor plant (Category 52230).
 - Space launch facility (Category 84110).
 - SS-24 Rail Deployment Site (Category 88117).
 - Submarine base (Category 952XX).

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- Surface-to-air missiles (Category 87XXX).
 - Transportation tunnels (Categories 442XX and 452XX).
 - Troop Installations (Category 901XX).
 - Urban area (Category 70100).

Known functional classification code numbers, in order:

- 21XXX: Oil refineries and other oil installations
 - 218XX: POL Storage
- 41XXX: Communications facilities, transmission and reception
 - 41121: Radio relay terminal
 - 4114X: Satellite ground station
 - 41430: Multipurpose switching center
- 42XXX: Electrical power generating plants and distribution facilities
 - 42140: Nuclear power electrical generating facility
- 43XXX: Water related?
 - 43110: Desalination facilities
 - 43900: Dams
- 44XXX: Road and water transportation
 - 44100: Bridges
 - 44120: Highway bridge
 - 442XX: Transportation tunnel
 - 44400: Piers and docks
 - 44530: Highway crossing a dam
 - 44700: Lines of Communication, highway
- 45XXX: Railroad tracks and yards
 - 45100: Railroad Bridge
 - 45120: Railroad bridge
 - 452XX: Railroad transportation tunnel
 - 45500: Railroad crossing a dam
 - 45700: Lines of Communication, railroad
- 46120: Inland locks and canals
- 5XXXX: Industry/economic
 - 52230: Semiconductor plant
- 60XXX/61XXX: Industry, weapons of mass destruction?
 - 604XX: Nuclear Weapons storage site (industry?)
 - 61XXX: Electrical power generating plants and distribution facilities
- 661XX: Chemical weapons
- 67100: Shipbuilding yard
- 7XXXX: Urban features and population
 - 70100: Urban area
 - 702XX: Cities/towns
 - 702XX: Population concentration
 - 75100: Population concentration
- 80XXX: Airfield
 - 80030: Arctic staging base
 - 80150: Heliport
- 82XXX: Air defense installation

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- 8224X: Air defense related command post bunker.
 - 841XX: Missile and rockets, civilian?
 - 84110: Space launch facility
 - 85XXX: Radar sites
 - 864XX: Airfield underground/cave support facilities
 - 871XX: Missile systems
 - 8715X: Cruise missile site
 - 872XX: Defensive missile sites/complexes
 - 873XX: Defensive missile sites/complexes
 - 875XX: Defensive missile sites/complexes
 - 875X1: ABM site
 - 876XX: Missile launch complex
 - 879X1: Missile Support Facilities for Ship-borne or Coastal Defense Missiles (bunkers)
 - 88XXX: Offensive (surface-to-surface) missile sites
 - 881XX: Missile systems
 - 88117: SS-24 Rail Deployment Site
 - 89XXX: National, Combined and Joint Command
 - 90XXX/91XXX/92XXX: Ground forces
 - 901XX: Troop Installations.
 - 902XX: Assembly and staging area
 - 910XX: Ground force headquarters
 - 911XX: Ground force headquarters
 - 920XX: Ground forces materiel repair and storage depot
 - 95XXX: Naval
 - 951XX: Naval base
 - 952XX: Submarine base
 - 97200: Naval ammunition storage

functional economic analysis (FEA). See also economic analysis (EA).

fuze. A device designed to initiate detonation in any type of ammunition by an action such as hydrostatic pressure, target proximity, chemical impact, mechanical time, or a combination of these.

GCCS Reconnaissance System (GRIS). Application used in Deliberate/Crisis Action Planning for limited nuclear options. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. iv, partially declassified and released under FOIA).

generated. "A force readiness condition which assumes the generation of all missiles, SSBNs and aircraft to alert status." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-11, partially declassified and released under the FOIA).

Generic Area Limitation Environment (GALE-LITE). DIA/NSA-maintained database that interacts with the Modernized Integrated Database (MIDB). Used by ACOM, CENTCOM, EUCOM, SOUTHCOM, STRATCOM, and TRANSCOM.

Geographic Installation Intelligence Production Specifications (GIIPS). DIA produced document that specifies significance codes for installations in the Automated Installation Intelligence File (AIF) and Integrated Database/Modernized Integrated Database (IDB/MIDB). GIIPS has replaced the Target Data Inventory (TDI) handbook and Contingency Planning Facilities List (CPFL) production documentation. The handbook contains specific guidance and procedures for use in analysis, production, and processing of target intelligence by DIA, the combatant commands, the military services, and other organizations responsible for maintaining the DOD installation intelligence data base.

geopolitical codes. Location codes for targets. Geopolitical or country codes are composed of two alpha characters listed in the *Target Intelligence Handbook*. These codes are used in every installation record as one of the basic identification elements.

GI. Graphics maps file database, a component of the Strategic Warfare Planning System .

Giant Lance. STRATCOM exercise involving selective employment of bomber and tanker forces, including the emergency loading of nuclear weapons.

Global Archer. Periodic internal training exercise conducted by STRATCOM to validate and test battlestaff, transition to war, and adaptive planning procedures. Activities can involve simulated trans- and post-execution operations, utilizing STRATCOM's mobile assets. (OSD, Nuclear Weapons Systems Sustainment Programs, May 1997).

Global Battle Management System (GBMS). Future STRATCOM command and control system intended to satisfy the command's need for a completely flexible worldwide technologies for strategic force planning and employment. According to STRATCOM, future planning requirements will include the need for a continually updated, global target set and the use of "worldwide web" technology allowing theater commanders to exploit total force capabilities and to use weapons smartly. Global communications will allow commanders to act using accurate, timely flow of information from an interoperable architecture to accommodate the threat situation while maintaining information superiority. (STRATCOM, "Minutes of the Fifty-Sixth United States Strategic Command Strategic Advisory Group Meeting (U) 24-25 October 1996, Offutt AFB, Nebraska," November 1996, p. 13, partially declassified and released under the FOIA).

Global Command & Control System (GCCS). A fixed and highly mobile, deployable command, control, communications, computers, and intelligence (C⁴I) system that supports forces for joint and combined operations throughout the spectrum of conflict anytime and anywhere in the world with compatible, interoperable, and integrated C⁴I systems. The family of computer hardware and software is replacing the World Wide Military Command and Control System (WWMCCS) and eliminating the Defense Secure Network 2 (DSNET-2). It will use the SECRET Internet Protocol Router Network (SIPRNET) for networking.

The GCCS uses the Common Operational Picture (COP) to provide a fused battlespace picture. This capability allows the display of land, air, sea, and air tracks on a near-real-time basis, overlaid on a chart background. To produce this picture, GCCS interfaces with other systems

such as service battlespace display systems, Tactical Area Data Information Link (TADIL) inputs, and other data feed systems such as JDISS. Through its core software, GCCS produces the geographic display, correlates contacts, and furnish track database capability. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA)," Version 98.1.0, 15 August 1998, p. 3-6, partially declassified and released under FOIA).

Global Guardian. Annual command-level exercise sponsored by STRATCOM in cooperation with the Space Command and the North American Aerospace Defense Command (NORAD). "The primary purpose of the exercise is to test and validate nuclear command and control and execution procedures. Exercise objectives include live communications and the participation of all elements potentially assigned to USSTRATCOM in wartime, including USSTRATCOM's Mobile Consolidated Command Center (MCCC), USSTRATCOM's Airborne Command Post (ABNCP), and external participation from national-level and other unified commands." The exercise links with other exercise activities sponsored by the Chairman, Joint Chiefs of Staff and the unified commands, to include:

- Crown Vigilance, sponsored by the Air Combat Command (ACC),
- Apollo Guardian, sponsored by the Space Command (SPACECOM),
- Amalgam Warrior and Vigilant Guardian, sponsored by the North American Aerospace Defense Command (NORAD).

(OSD, Nuclear Weapons Systems Sustainment Programs, May 1997).

The Global Guarding 97 exercise, conducted 13-22 November 1996, following implementation of SIOP-97, included/identified issues relating to the following for further STRATCOM work:

- Theater Nuclear Options (TNO) and Directed Nuclear Options (DNO).
- Better coordination of tanker TNO/DNO missions.
- B-52H Cold Weather starting problems using JP-8 fuel. The problem was tested again during B-52H exercises at Minot AFB in January 1997.

(STRATCOM/J371, "Exercise Global Guarding 97 After Action Report," 15 April 1997, p. C-36, C-37).

Global Navigation Chart (GNC). A 1:5,000,000 scale series of multicolored charts designed for general planning purposes for operations involving long distances or large areas of in-flight navigation in long range, high altitude, high speed aircraft.

Global Reconnaissance Support (GRS)/Point Target Ellipse (PTE). Element of the Missile Target Materials Program.

Graphical Editor (GRE). Component of the software architecture in the NLD Integrated Development System (NDS) for SIOP mission planning. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. viii, partially declassified and released under FOIA).

Graphical Route Analysis and Penetration Evaluation System (GROPS). See also Route Analysis and Penetration Evaluation System (ROPES). The system is slated to be eliminated. Vendors include Oracle.

gross error. A nuclear weapon detonation at such a distance from the desired ground zero (DGZ) as to cause no nuclear damage to the target.

ground zero. The point on the surface of the earth at, or vertically below or above, the center of a planned or actual nuclear detonation.

guidance. The basis for SIOP preparation, in the form of civilian directives from the President and Secretary of Defense, or plans and guidance from the Joint Chiefs of Staff. Civilian guidance documents that influence SIOP preparation include Presidential Decision Directives (PDDs) and Presidential Review Directives (PRDs), the annual National Security Strategy and National Military Strategy documents, the Nuclear Weapon Employment Policy (NUWEP), the Defense Planning Guidance (DPG), and the Contingency Planning Guidance (CPG). Joint Chiefs of Staff input comes primarily via the Joint Strategic Planning System (JSPS), including the Joint Strategy Review (JSR), Chairman's Guidance (CG), and the Joint Strategic Capabilities Plan (JSCP).

hardness. (Nuclear) The degree of resistance of a weapon or its components to adverse environments, particularly the effects of a nuclear burst.

Hazard Assessment System & Consequence Analysis (HASCAL). Defense Special Weapons Agency developed Oracle based database management system. Also known as HASCAL SCIPUF.

Hazard Prediction and Assessment Capability (HPAC). Oracle-based database management system.

height of burst (HOB). The vertical distance from the earth's surface or target to the point of burst. For nuclear weapons, the optimum height for a particular target (or area) is that at which it is estimated a weapon of a specified yield will produce a certain desired effect over the maximum possible area. HOB adjustments, including the use of subsurface detonations, are a means of controlling collateral damage and fallout.

height of burst error probable. Error in height of burst which missile or projectile fuses may be expected to exceed as often as not.

high altitude burst. The explosion of a nuclear weapon which takes place at a height in excess of 100,000 feet.

high altitude electromagnetic pulse (HEMP). The electromagnetic energy produced by a nuclear weapon detonated at a high altitude. See electromagnetic pulse.

horizontal error. The error in range, deflection, or radius, which a weapon may be expected to exceed as often as not. Horizontal error of weapons making a nearly vertical approach to the target is described in terms of circular error probable (CEP). Horizontal error of weapons producing elliptical dispersion patterns is expressed in terms of probable error.

HUMINT Operational Communications Network (HOCNET). DIA system used by EUCOM,

CENTCOM, SOCOM, STRATCOM, and TRANSCOM.

I-90. Installation (industry-related) data used in the construction of the National Target Base (NTB).

Improved Emergency Message Automated Transmission System (IEMATS). A dedicated message processing system linking STRATCOM, the National Military Command Center in the Pentagon and the Joint Communications Center (Site R), as well as the command centers of other nuclear-capable CINCs, and used for transmitting emergency action messages (EAMs), the written authorizations to use nuclear weapons. See also DIRECT (Defense IEMATS Replacement Command and Control Terminal).

Improved Many-on-Many (IMOM). Electronic order of battle (i.e., early warning and target tracking functions) analysis model, first introduced in 1985, used to display radar coverage taking into account locations, terrain, and operating characteristics. The code is unclassified.

Initial Point (IP). 1. The first point at which a moving target is located on a plotting board. 2. A well-defined point, easily distinguishable visually or electronically, used as a starting point for a bomb run on a target.

installation coordinates. A standard element for installation identification, using latitude and longitude coordinates. Reference coordinates for each installation are selected by approximating the center of mass for an installation. For airfields, the center of the runway or intersection of major runways is selected.

installation name. A standard element for installation identification. Because of the many types of installations, coupled with the various name forms and component parts, a specific procedure is used to select and apply installation names. There are seven name components used to identify installations. These components appear in the following order: place name, functional name, distinguishing descriptive terms, proper name, honorary name (“imani”), underground designation, and installation alpha or numerical designators. However, not all of these names may appear on one installation. Standard abbreviations and procedures are contained in the *Target Intelligence Handbook*. The DIA assigns and/or verifies all installation names.

installation reference number. A number assigned to an installation to provide a means of associating urban areas, cities and towns, population concentrations, and other categories of target installations into target complexes.

Integrated Analysis System (IAS). A prototype system of graphical user interfaces, data movers, and a local database which will provide analysts standard access to a set of analysis models to with a single, integrated "look and feel" for integration of the Strategic Warfare Planning System environment and the Enterprise Database (EDB) into the Strategic War Planning Systems Enterprise Database (SWPS-EDB). The Top Secret SIOP/ESI IAS supports analysis of SIOP mission planning through the modeling of physical effects and events. It combines several separate products that look at radiation levels and fallout patterns, probability of success of bombers and missiles, results of one-on-one SAM-aircraft engagements, generation of terrain-aware and threat avoiding sortie routes, and total SIOP analysis. IAS includes the

following models: Arsenal Exchange Model (AEM)/Front-end/Back-end Processors for the AEM (FROBAK)/ORCA Planning and Utility System (OPUS) all used in RISOP production, FAS/CIVIC, PDCALC (Probability of Damage Calculator), Multiple Engagement Module (MEM), Extended Air Defense Simulation (EADSIM), and Strategic Offense/Defense Simulation (SODSIM). IAS is managed and maintained by GDE together with STRATCOM. It is an Oracle-based system.

IAS-2 (Build 2), scheduled for the FY 1999-2000 time frame, will provide SIOP analysts with expanded functions, including theater nuclear planning support, exercise analysis, and accessibility to the Joint Resources Assessment Data System (JRADS). It is scheduled to be ready to support SIOP 00 production beginning in March 1999.

Integrated Comprehensive Weaponeering Capability (ICWC). Future STRATCOM planning tool that will provide the capability to weaponeer a full spectrum of targets and weapons including nuclear weapons and advanced conventional weapons. The tool is part of the Integrated Target Planning Tool Set (ITPTS). (DSWA, "Statement of Work for Integrated Target Planning Tool Set," DSWA01-98-R-0026, 13 May 1998).

Integrated Data Base (IDB). The core automated database of the Military Intelligence Integrated Data System (MIDS). It describes units, personnel, equipment, facilities, and installations in accordance with Joint Pub 1-02 definitions. The information in the IDB is integrated in a manner to facilitate analytical manipulation of information to assess the military capabilities and vulnerabilities of countries worldwide (except the United States and Canada). (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-11, partially declassified and released under the FOIA). See also Modernized Integrated Data Base (MIDB).

Integrated Nuclear Command and Control System (INCCS). The vision for a fully integrated STRATCOM war planning and command and control system.

Intelligence Data Handling System (IDHS). STRATCOM intelligence system architecture. The IDHS-95 architecture, the current system, is workstation-based, whereas IDHS-90, the legacy system, is mainframe based. The IDHS provides the functional category code to identify the function of an installation or facility for targeting purposes. See functional category code.

Integrated Target Planning Tool Set (ITPTS). Future system which will provide an integrated capability for pre-attack target planning, consequence assessment, and post-attack assessment for the full spectrum of weapons and targets, including weapons of mass destruction targets. The system will be compatible with the Global Command and Control System (GCCS), and an expanded design version (Integrated Comprehensive Weaponeering Capability (ICWC)) will provide the capability to weaponeer a full spectrum of targets and weapons including nuclear weapons and advanced conventional weapons. (DSWA, "Statement of Work for Integrated Target Planning Tool Set," DSWA01-98-R-0026, 13 May 1998).

Integrated User Interface (IUI). Component of the software architecture in the NLD Integrated Development System (NDS) for SIOP mission planning. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August

1998, p. viii, partially declassified and released under FOIA).

JD. Joint DGZ file database, a component of the Strategic Warfare Planning System .

JL. Joint National Strategic Target List (NSTL) file database, a component of the Strategic Warfare Planning System .

JL Database Maintenance (N204A/N204B/N204C). Strategic Warfare Planning System National DGZ List (NDL), National Target Base (NTB), and Weapons Modules slated to be eliminated.

Joint Coordination Center (JCC). STRATCOM organization located at the underground Site R, the Alternate National Military Command Center (ANMCC), near Ft. Ritchie, MD. The peacetime function of the JCC is to disseminate strategic nuclear operational data to the NCA, NMCC, the Joint Staff, and other unified commands. During wartime, the JCC is charged with serving as a national-level nuclear data collection and reporting agency.

Joint Digital Target Material (JDTM). Under development by NIMA to replace the Basic Target Graphic (BTG), the JDTM will provide a general reference describing an individual installation or facility's location, function, significance, critical elements, and other pertinent targeting information. The JDTM concept calls for a product consisting of text, imagery and geospatial overlays in varied formats (e.g., raster, vector), allowing a user to select and manipulate only those elements required. The JDTM will be an integrated relational set of standard formatted data pulled from varied data bases, such as Integrated Database/Modernized Integrated Database (IDB/MIDB) and NIMA's Global Geospatial Information & Services (GGI&S), packaged in a standardized manner.

Joint Munitions Effectiveness Manual (JMEM). Joint service weaponeering manuals providing effectiveness evaluations of conventional weapons against selected targets. Weapon characteristics, target vulnerability, delivery accuracy, methodology, reliability, obscuration, and air combat are covered in detail. The weapon effectiveness and lethality indexes used by JMEM are Mean Area of Effectiveness (MAE), Vulnerable Area (VA), Crater Diameter (DC), Effective Miss Distance (EMD), Bridge Effectiveness Index (BEI), Number of Hits (NH), Probability of Damage (Pd), and Probability of Damage Given a Hit (Pdh). These indexes account for the primary damage mechanisms of non-nuclear weapons.

Joint Operation Planning and Execution System (JOPES). A continuously evolving joint command and control system integrating two earlier planning and execution systems, the Joint Operation Planning System and Joint Deployment System. JOPES is used for conventional operation planning and execution (to include theater-level nuclear and chemical plans) and is part of the general command and control support system for SIOP execution and control external to STRATCOM.

Joint Operations Graphic (JOG). The standard 1:250,000 scale Department of Defense cartographic product which may be produced in any of the following three versions to meet the validated unified and specified commands and military departments area requirements: the JOG/G (Series 1501) is designed to meet ground use requirements; JOG/A (Series 1501 Air) is

designed to meet air use requirements; and JOG/R (Series 1501 Radar) is the Air Target Material (ATM) version in support of radar/intelligence planning and operations requirements of the bomber and fighter force.

Joint Plan Interim Change (JPIC). Forms part of the Nuclear Planning and Execution System (NPES). (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. v, partially declassified and released under FOIA).

Joint Resource Assessment Data System (JRADS). JRADS provides a "Blue" facility, resource, and population database to the nuclear command and control community. The database supports the Nuclear Planning and Execution System (NPES) and nuclear-related analysis requirements for the Joint Staff, STRATCOM, and the Defense Intelligence Agency (DIA). Updates to the database are supported by the military services, DISA, DIA, the Bureau of Census, and other government agencies and organizations. The ADP manager of the JRADS database is CFAE, with oversight by the Joint Staff. The current JRADS project has been downsized from the JRADS Worldwide Military Command and Control System (WWMCCS). The user community and scope of the database have been redirected, primarily to the nuclear command and control community to be used in RISOP gaming and other war games. The basic JRADS systems is being replaced by JRADS-R (Joint Resource Assessment Data System-Replacement).

Joint Strategic Capabilities Plan (JSCP). JCS-produced national planning document that specifies the requirements and parameters for SIOP and non-strategic nuclear contingency planning, and specifically contains the targeting and damage criteria for the use of nuclear weapons. After the Defense Planning Guidance (DPG) and Contingency Planning Guidance (CPG) are published by the office of the Secretary of Defense, the Joint Staff prepares the biennial JSCP. The JSCP contains guidance to the commanders of all unified commands and the Chiefs of the military services for the accomplishment of military tasks in the short-range period (2-3 years). It directs the development of plans to support national security objectives by assigning tasks and apportioning major combat forces to the commanders of unified commands. The JSCP consists of a basic volume and supplements. The Basic Volume provides a strategic military framework that ties CINC, JCS, and NCA actions together to respond to crises and covers the full spectrum of conflict from pre-conflict deterrence measures through force deployment and employment. It assigns task to the CINCs and guidance to the Service Chiefs in the preparation of war plans. The JSCP Supplemental Instructions (previously named JSCP Annexes) provide additional guidance for specific contingencies. CJCS Instructions (CJCSI) identify current supplements to the JSCP:

- CJCSI 3110.02 (Intelligence).
- CJCSI 3110.03 (Logistics).
- CJCSI 3110.04 (Nuclear).
- CJCSI 3110.05 (Psychological).
- CJCSI 3110.06 (Special Operations).
- CJCSI 3110.07 (Nuclear, Biological, Chemical; Riot Control Agents; and Herbicides).
- CJCSI 3110.08 (Mapping, Charting, and Geodesy).
- CJCSI 3110.09 (Command and Control Warfare (C²W)).
- CJCSI 3110.10 (Command, Control, Communications, and Computer Systems).

- CJCSI 3110.11A (Mobility).
- CJCSI 3110.12 (Civil Affairs).
- CJCSI 3110.13 (Mobilization).
- CJCSI 3110.14 (Military Operations Other Than War (MOOTW)).
- CJCSI 3110.15 (Special Technical Operations).

The Nuclear Supplement (CJCSI 3110.04) is also traditionally called “Annex C.” The supplement establishes parameters and constraints that are the basis for target development. It also directs probability of damage (PD) that are to be obtained against individual installations and groups of installations. For non-strategic nuclear forces, the nuclear supplement “describes situations which could lead to a request for the selective release of nuclear weapons.” (JCS, *Doctrine for Joint Theater Nuclear Operations*, Joint Pub 3-12.1, p. II-1.)

According to STRATCOM, JSCP Annex C “defines the threat to be countered, provides the projected threat environment, and levies requirements on the planning product of the SWPS (i.e., the SIOP). It also discusses Theater Nuclear Option (TNO) requirements as well as other requirements so directed by the NCA. Based on current direction, it is becoming increasingly important to provide a full range of military response options to any potential military threat.” (STRATCOM, “Operational Requirements Document (ORD) for United States Strategic Command (USSTRATCOM) Strategic War Planning System (SWPS),” December 1994, p. 14, partially declassified and released under the FOIA).

The JSCP FY 96 Nuclear Supplement consists of a brief introduction following by eight enclosures:

Enclosure A	General
Para 1	Purpose
Para 2	Scope
Para 3	Focus
Para 4	Basic Employment Objectives
Para 5	Required U.S. Capabilities
Para 6	Force Readiness Planning
Enclosure B	Weapon Deployment and Security
Para 1	Deployment Concept
Para 2	NSNF Deployment and Reconstitution
Para 3	Weapon Security
Enclosure C	General Employment Planning Guidance
Para 1	Scope
Para 2	General
Para 3	Planning Coordination
Para 4	Planning Factors
Para 5	Nuclear Execution
Para 6	Nuclear Termination
Para 7	Escalation Control
Para 8	Constraints
Para 9	Relocatable Targets
Para 10	Exceeding Limitations
Enclosure D, Part I	SIOP and NRF Employment Planning
Para 1	Scope

Para 1c	Focus/MAOs and LAOs
Para 2	Force Commitment
Para 2a	SIOP Committed Forces
Para 3	Force Allocation and Application
Para 4	Target Development
Para 5	Target Lists
Para 5a	National Target Base
Para 6	Selection and Damage Level Guidance
Para 6f	Damage Levels
Para 7	MAO Structure
	(Note: This section contains 12 directives contained in the SIOP. These directives were used as the standards against which the SIOP 97 war game predicted the effectiveness of the SIOP.)
Para 8	MAO Targeting Guidance
Para 9	MAO Planning Guidance
Para 9a(1)	Force Readiness Survivability and Timing
Para 9a(3)	Force Readiness Conditions
	Execution of Scenarios
Para 9a(4)	Timing Plans
Para 9a(5)	(Note: This section contains nine assumptions for plannings.)
Para 9b	Weapons Allocation
	(Note: This section contains priorities for allocating weapons.)
Para 9c	Defense Suppression Planning
Para 9d	Measures of Effectiveness
Para 10	Limited Attack Options
Enclosure D Part II	NRF and Adaptive Planning
Para 1	Purpose
Para 2	SRF Structure
Para 2b2	Nuclear Reserve Force
	(Note: This section outlines the structure of the NRL to consist of the Secure Reserve Force (SLBMs and bombers) and Residual Forces. The latter consists of strategic (recovered/reconstituted), uncommitted and unexecuted forces) and non-strategic forces (uncommitted and not NATO designated).)
Para 3	SRF Planning and Sizing
Para 4	Adaptive Planning
Enclosure E	Theater Nuclear Planning
Para 1	Scope and Applicability
Para 2	General
Para 3	Theater Targeting Requirements
Para 4	Theater Nuclear Targeting Limitations
Para 5	Theater Nuclear Option Employment
Para 6	Nuclear Appendices to OPLANs
Para 7	Crisis Management
Para 8	Adaptive Planning Procedures
Enclosure F	Reconnaissance in Support of Nuclear Operations
Para 1	Scope

Para 2	Reconnaissance Objectives
Para 3	Applicability
Para 4	Reconnaissance Priorities
Para 5	Reconnaissance Force Management
Para 6	Planning Concepts
Para 7	Planning Guidelines/Requirements
Para 8	Battle Management Considerations
Enclosure G	SIOP and NRF Review, Approval, and Analysis
Para 1	Scope and Applicability
Para 2	General
Para 3	SIOP and NRF Revision
Para 5	Logic
Para 5a	SIOP Analysis
Para 5b	Wargaming
Enclosure H	Responsibilities
Para 1	Purpose
Para 2	Chairman of the Joint Chiefs of Staff
Para 3	Combatant CINCs
Para 4	USCINCSTRAT

(CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, partially declassified and released under the FOIA).

The latest Nuclear Supplement is dated 31 October 1996 (with Change 2). It replaced the basic FY 1996 version dated 12 February 1996. This document replaced JSCP Annex C with Change 5 dated August 1995.

Joint Strategic Target Planning Staff (JSTPS). Former JCS staff, activated in 1961, and responsible for the development of the SIOP. The JSTPS was located at Strategic Air Command (SAC) headquarters, and though it was composed of representatives of all the services, its director was an Air Force General who was also the commander in chief of SAC (and designated the Director of Strategic Target Planning in that role). The JSTPS was inactivated in 1991 when U.S. Strategic Command (STRATCOM) was activated.

Joint Worldwide Intelligence Communications System (JWICS). A global communications system that provides the bandwidth needed to move digital imagery quickly from the intelligence agencies and between commands.

K factor. A vulnerability factor assigned to a target that indicates the target ductility and response to a 20-kiloton blast wave. K factors range in value from 0 to 9. Since dynamic pressure sensitive targets (like heavy, reinforced concrete buildings) are usually very sensitive to blast wave duration, such targets generally have large K factor values. A few special “P-type” targets, such as buried structures and structures flush with the ground (missile silo doors, for example) have low K factors, indicating that they respond solely to overpressure. See also Vulnerability Numbers (VN).

knee of the curve analysis. Process in SIOP target development that identifies marginal return

where network “capacity” is the critical item evaluated in targeting.

LAUNCH. Strategic forces report that is part of the Nuclear Planning and Execution System (NPES) and the Nuclear Execution Reporting Plan (NEREP).

laydown. 1. “A weapon employment concept that requires weapon survival upon ground impact following release from low-flying delivery aircraft and delayed fuzing and firing of the weapons in order to permit safe escape of the aircraft.” (DNA Dictionary, p. 86). 2.

Implementation of the SIOP or a SIOP option (e.g., the MAO-1 through MAO-4 laydown).

layering. “Layering is a targeting methodology that plans employing more than one weapon against a target to increase the probability of its destruction or to improve the confidence that a weapon will arrive and detonate on that target and achieve a specified level of damage.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-6.)

leadership. One of four target categories in the “four-category targeting strategy,” including headquarters of leadership-supporting offices, ministries, and agencies; command posts of political and military leadership; and key communications facilities. See also nuclear forces, conventional forces, economic and industrial targets.

Limited Attack Option (LAO). A generic term in current SIOP planning for attack options other than those that are part of the Major Attack Option (MAO) structure. Does not include Adaptive Planning Options (APOs). Formerly called Limited Nuclear Options.

Limited Nuclear Options (LNO). 1. Also previously known as “limited employment options.” A broad concept, not a specific SIOP option, of preplanned selected nuclear attacks against a discrete set of targets as opposed to massive attacks (Major Attack Options). Limited nuclear options are nuclear options in which the level, scope, and duration of attacks is limited in such a way that it is clearly communicated to the enemy. Secretary of Defense James Schlesinger is credited with introducing this concept in the 1970's. National Security Decision Memorandum 242 (NSDM-242) issued by President Nixon, codified the requirement for LNOs (“limited nuclear employment options”), which it defined as “options which enable the United States to conduct selected nuclear operations, in concert with conventional forces, which protect vital U.S. interests and limit enemy capabilities to continue aggression. In addition, these options should enable the United States to communicate to the enemy a determination to resist aggression, coupled with a desire to exercise restraint.” (William M. Arkin, et al, *Encyclopedia of the U.S. Military*, p. 487) 2. A SIOP option, no longer in use “designed to permit the selective destruction of fixed enemy military or industrial targets.” (*Department of Defense Annual Report Fiscal Year 1980*, p. 85). See Limited Attack Option (LAO).

linear target. A target characterized by a long and narrow shape; for example, a runway or railroad track.

Mach Stem. When a blast wave strikes a denser medium such as the earth’s surface, it is reflected. The reflected wave near the surface travels through a region that is heated and made denser than the ambient atmosphere, by the initial or incident shock front as it passes. Since shock front velocity is greater in heated air, a portion of the reflected shock can, under appropriate conditions, overtake and merge with the incident shock front (initial shock). This

forms a single shock front called the Mach stem, which produces higher peak overpressures and lower dynamic pressures at or near the surface. A target above the top of the Mach stem receives two shocks, corresponding to the arrival of both incident and reflected waves. A target at or below the top of the Mach stem receives a single shock. The reflection process transforms part of the incident dynamic pressure into overpressure. A target below the top of the Mach stem is subjected to a higher overpressure impulse and a lower dynamic pressure impulse than a target above the top of the Mach stem.

Major Attack Option (MAO). The central SIOP attack option(s) that would be undertaken to implement a retaliatory strike against Russia. The SIOP is made up of MAOs and various additional options (e.g., Adaptive Planning Options, Directed Planning Options) that would supplement the MAOs, either subsequent to their implementation or to carry out smaller scale attacks.

At least as of 1996, there were believed to be four MAO plans, each representing different levels of alert for U.S. nuclear forces, and progressively larger groups of targets. These four MAOs are referred to as:

- MAO 1: The basic counterforce attack on enemy nuclear forces, with a withhold against cities.
- MAO 2: Counterforce plus additional nuclear-related targets such as warhead storage sites and dispersal and secondary airfields. A withhold against cities persists.
- MAO 3: Counterforce (MAO-2) plus leadership.
- MAO 4: Full scale attack across the entire target base, adding economic targets. This primarily includes final weapons assembly and energy production and distribution.

It is interesting to note that the 1996 Strategic Target Review mentions only two major attack options, MAO-1 and MAO-2 (STRATCOM, "SIOP Target Review," 19 July 1996, p. 24, Appendix C, p. C-23, and Appendix T, p. T-69, partially declassified and released under the FOIA).

Maximum Allowable Dose Index (MADI). A tool used to calculate the effect of nuclear detonations on the population. The JSCP Nuclear Supplement defines MADI as "the maximum allowed unprotected dose, at any selected monitor point, for a defined set of population risk criteria (risk level, risk dose, and population exposure level)." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-12, partially declassified and released under the FOIA).

mean area of effectiveness (MAE). A measurement, in square feet, of an abstract area determined by dividing the area affected by a weapon into small elements and, finally, summing the product of the probability of damage (PD) within each element and the area of each element. MAE depends upon target vulnerability, weapon characteristics, impact velocity, weapon angle of fall, and height of burst.

Mean Installation Damage Expectancy (MIDE). A measure of damage expectancy used in SIOP planning to express the extent to which SIOP can meet the damage criteria established for a given target set. In the war game analysis for SIOP 98 (in effect 1 October 1997), for example, STRATCOM planners "considered MIDE values above 0.7 (70%) to indicate that SIOP 98 'meets or exceeds' the damage required for a given target set. MIDE values between 0.4 (40%)

and 0.7 (70%) indicate SIOP 98 'conditionally meets' the damage requirement. MIDE values below 0.4 (40%) indicate SIOP 98 'fails to meet' the required damage." (STRATCOM/J531, "USSTRATCOM War Game Analysis Report for SIOP 98 (U)," 5 September 1997, p. 4-1, partially declassified and released under the FOIA).

mean point of impact (MPI). The point that has as its range and deflection coordinates the arithmetic means of the range and deflection coordinates and the individual weapon impact points.

MG. Migration file database, a component of the Strategic Warfare Planning System.

Migration Defense Intelligence Threat Data System (MDITDS). DIA system used by STRATCOM that is replacing the DTIDS.

Military Intelligence Integrated Data System/Integrated Database (MIIDS/IDB). The nation's centralized intelligence database maintained by DIA. Under the DIA managed Shared Production Program, STRATCOM J2 is responsible for the exploitation, production, and fusion of multi-source intelligence on foreign aviation and command, control, and communications units and associated installations and facilities to update the Military Intelligence Integrated Data System/Integrated Database (MIIDS/IDB). STRATCOM produces imagery exploitation reports and finished intelligence on foreign airfields and associated facilities, installations, air frames, and electronics. The J2 Defensive Branch also analyzes ground-based aerospace defense command, control and communications (C³), surface-to-air and anti-ballistic missiles, and air surveillance units and associated facilities. It prepares the defensive missile, electronic, and C³ installation and order of battle database for NTB determination, and analyzes intercepted electronics signals for production of Volume 1 of the Defense Intelligence Electronic Order of Battle (DIEOB) database. This data is used to determine adversary air surveillance capabilities, for SIOP route planning and modeling. STRATCOM J2 also performs analysis of C³ networks to identify critical nodes for air defense suppression. See also Integrated Database (IDB) and Modernized Integrated Database (MIDB).

Missile/Air Target Materials Program (M/ATMP). Provide cartographic and geodetic information to support en route and terminal strike activities for air and missile operations. Includes the Air Target Materials Program (ATMP) and the Missile Target Materials Program (MTMP).

Missile Aircraft Difference Evaluation System (MADES). Quality control program for force application review of the SIOP.

Missile Applications (A101M). Strategic Warfare Planning System application slated to be eliminated..

Missile Execution Planning. Strategic Warfare Planning System application.

Missile Graphics Planning System (MGPS/M115). Strategic Warfare Planning System workstation application, a graphics-based planning tool which supports interactive missile allocation/application, missile maintenance, and construction and placement of ballistic missile

submarine (SSBN) launch patrol areas. The system displays the location and characteristics of weapon assignments, targets, and submarine launch patrol areas. When MGPS has completed missile application, the MS database component of SWPS is moved to Weapon Review where the Missile Aircraft Difference Evaluation System (MADES) is used to perform quality control. The system is managed by TRW. Vendors include Central Point Software, 3Com Corporation, Delrina Tech, Inc., Periscope, Oracle, GSC Corporation, Zsoft Corporation, Aldus, MicroGrafX, Pinnacle Micro, Contec, Application Tech, Adobe Systems, Catapult Systems, IBM, PowerSoft, Microsoft, Sybase, and PowerBuilder.

Missile Graphics Planning System/Rapid Prototyping Module (MGPS/RPM). Graphics-based interactive ICBM and SLBM missile planning system, part of the Strategic Warfare Planning System . See also Rapid Prototyping Module (RPM).

Missile Kit Activ. Strategic Warfare Planning System application.

missile sortie.

Missile Target Materials Program (MTMP). Element of the Missile/Air Target Materials Program that provides the precise geodetic positional data needed to support missile systems and strategic nuclear forces. It includes the Strategic Target Program, Tactical Target Program, Radar Fix Points (RFP), Offset Aim Points (OAP), and Global Reconnaissance Support (GRS)/Point Target Ellipse (PTE).

Mission Data Preparation System (MDPS). Bomber-related planning system used by the 608th Air Operations Group for SIOP planning. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. xi, partially declassified and released under FOIA).

Mobile Consolidated Command Center (MCCC). STRATCOM ground mobile command and control platform located at Cornhusker Army Ammunition Plant in peacetime. Formerly called the CINC Mobile Alternate Headquarters (CMAH).

Modernized Integrated Data Base (MIDB). Intelligence community migration system which supports maintenance and dissemination of the worldwide General Military Intelligence (GMI) database under the DIA shared production program. MIDB provides a set of analytical tools to allow for maintenance, retrieval, and orders of battle. The system provides for data exchange between intelligence and operational consumers from the national to tactical levels. The database contains a baseline source of worldwide intelligence on installations, military forces, population concentrations, command and control structures, significant events, and equipment. MIDB was designed to incorporate several programs into a single set of common core database structures and analytical applications, and replaces the Integrated Database (IDB), which replaced the Target Data Inventory (TDI). A secret level version of the database, called C-MIDB (Collateral Modernized Integrated Database), is used to exchange information with allies.

In October 1993, the Integrated Database (IDB) was introduced, replacing the Target Data Inventory (TDI). Version 2.0 of the MIDB was introduced in March 1998. It contains major changes, including deletion of the significance code, used for target selection and coding by

STRATCOM. STRATCOM must take these significance codes and convert them to the National Target Base Server (NTBS).

A targeting extension to the MIDB is under development which will extract selected data fields from the database to support targeting. MIDB in theory refocuses the IDB towards the data user through a series of user interface upgrades that allow a friendlier operating environment. The "tools" available include: look-up tables, help features, standard query tables, a graphical display capability, and improved data output through a broader reports capability. See also Integrated Database (IDB).

Minuteman III Operational Targeting Program 3 (MOTP3). Application that is part of the Allocated Windows Planning System (AWPS).

Missile Performance Software (MPS). Research and evaluation tool, introduced in 1990, to examine the utility and effectiveness of a limited ballistic missile attack over a range of scenarios. It computes data for up to ten ballistic missiles. The code is unclassified.

monitor point. A selected geographic point for which the expected radioactive dose from a nuclear detonation is evaluated. (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-13, partially declassified and released under the FOIA).

MS. Missile sortie file database, a component of the Strategic Warfare Planning System .

Multi-weapon, Multi-aimpoint, Multi-criteria Development Automated Change List Handler Program (M3DACHLR). DGZ construction program replaced by the NDL Integrated Development System (NIDS). M3DACHLR is a graph theoretic algorithm that uses a binary tree method to construct aimpoints.

Multiple Attribute Decision Criteria (MADC). A targeting methodology used for airfields where a variety of attributes are quantified into a single number between 0 and 1, giving a relative ranking.

Multiple Engagement Model (MEM). Analysis model introduced in November 1986, and developed by the Joint Strategic Target Planning Staff, that models SIOP missile attrition due to ABM system and strategic defense performance. MEM is a time-sequenced program that steps through the engagement in chronological order: entering vehicles, computing intercept conditions, launching interceptors, and processing the nuclear detonations that result. The measures of merit are the probability of penetration by individual sorties, fratricide avoidance, chaff and blackout, radar data overload, and nuclear effects. The code is Top Secret. The MEM model is linked to the SINBAC (System for Integrated Nuclear Battle Analysis Calculus) model for use in SIOP/RISOP war games. There are two versions of MEM, a new workstation module and the older Multiple Engagement Module-Mainframe (MEM-MF) on the TRIAD Computer System (TRICOMS) that is slated to be eliminated.

Multiple Engagement Model Preprocessor (FLYMEM). FLYMEM produces a strike file for the Multiple Engagement Module (MEM) system. FLYMEM takes a user-built sortie file consisting of command, unit, sortie and mission records and queries it against the Strategic War Planning

Systems Enterprise Database (SWPS-EDB) to produce an output file of detailed missile strike information. Vendors include Microsoft.

MW. Database, a component of the Strategic Warfare Planning System .

National Airborne Operations Center (NAOC). The STRATCOM airborne command post.

National Command Authorities (NCA). “The National Command Authorities consist only of the President and the Secretary of Defense or their duly deputized alternates or successors.” (JCS, Emergency Action Procedures, Vol. 1, 1 April 1984, pp. 1-16 and 1-17, released under the FOIA). The JSCP Nuclear Supplement states that “the chain of command runs from the President to the Secretary of Defense to the commanders of the unified commands. The channel of communication for execution of the SIOP and other time-sensitive operations is from the President through the Chairman of the Joint Chiefs of Staff to the executing commanders.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, pp. GL-13-14, partially declassified and released under the FOIA).

The NCA dates from a National Security Council document, “United States Policy on Atomic Weapons,” 10 September 1948, which states that “the decision as to the employment of atomic weapons in the event of war is to be made by the Chief Executive when he considers such decision to be required.” (J.L. Gaddis and T. Etzold, *Containment: Documents on American Policy and Strategy, 1945-1950*, (NY: Columbia University Press, 1978).

National Desired Ground Zero (DGZ) List (NDL) Integrated Development System (NIDS). Strategic Warfare Planning System application, a modernized planning tool which builds and maintains DGZs in the NDL, performs data validation, constructs and maintains target island boundaries, and applies option coding (for SIOP options). NIDS also performs quality assurance and casualty assessments for the DGZs. NIDS integrates over 20 programs previously used separately for DGZ construction and coding into a single interactive graphics workstation. NIDS-II, which is scheduled for IOC in January 1999, will reengineer the functionality of target development/maintenance from NTBS and Target Planning System (TPS) with DGZ construction and maintenance from NIDS. NIDS-II incorporates PDCALC (Probability of Damage Calculator) and FAS/CIVIC, and receives data from the UKLO (SACEUR) database, the CIA’s WDB, the NIMA WVS, and the NTBS (IDHS) database via EISI. NIDS-II is developed and managed by SAIC. Vendors include Microsoft, Softguard Systems, Sun, CDI, SpeedLink, Everex Systems, Inc., Haestad methods, FaxPoint Tech, Desaware, STAC, Vinca, and Oracle.

National Desired Ground Zero List (NDL). The authoritative list of all SIOP desired ground zeros (DGZs or aim points), part of the Strategic Warfare Planning System , and derived from the National Target Base (NTB). It is that aspect of the weapons assignment (allocation) stage of SIOP production that matches weapons with DGZs. See also NDL Integrated Development System (NIDS) and NDL Maintenance.

National DGZ Support System (NDLSS). Component of the software architecture of the NDL Integrated Development System (NIDS). (STRATCOM/J66, “U.S. Strategic Command

(USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. ix, partially declassified and released under FOIA).

National Imagery and Mapping Agency (NIMA). Agency created by the merger of the Defense Mapping Agency, the National Photographic Interpretation Center (NPIC), and elements of the Central Imagery Office, National Reconnaissance Office and DIA imagery offices.

National-Level Military Controls. The command elements, associated staffs, command post facilities, and supporting communications (in the hierarchically structured military C³ systems) responsible for preparing and maintaining a military force structure for war, as well as planning and executing combat operations with that force. (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-14, partially declassified and released under the FOIA).

National Military Command Center (NMCC). Pentagon-based war room supervised 24 hours a day, seven days a week, by a general/flag officer.

National Nuclear Intelligence Collection Plan (NNICP). The comprehensive intelligence collection plan in support of the SIOP, which is developed, published, and maintained by STRATCOM. The NNICP includes National Command Authority (NCA) Essential Elements of Information (EEI). (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. H-10, partially declassified and released under the FOIA).

National Security Decision Directive (NSDD). One of a series of directives that has been used to announce Presidential decisions implementing national policy objectives in all areas of national security. The national security decision directive term was used during the Reagan Administration. All NSDDs in this series were individually identified by number and signed by the President. National Security Decision Directive 13 ("Nuclear Weapons Employment Policy"), signed in October 1981 by President Reagan, replaced Presidential Directive 59, signed in 1980 by President Carter. Presidential Decision Directive 60 (PDD-60), signed by President Clinton in November 1997, replaced NSDD 13. See Presidential Directive.

National Security Decision Memorandum (NSDM). One of a series of directives that has been used to announce Presidential decisions implementing national policy objectives in all areas of national security. The national security decision memorandum term was used during the Nixon and Ford Administrations. All NSDMs in this series were individually identified by number and signed by the President. National Security Decision Memorandum 242 ("Planning Nuclear Weapons Employment for Deterrence"), signed 17 January 1974 by President Nixon, was replaced by Presidential Directive 59, signed in 1980 by President Carter. See Presidential Directive.

National Security Directive (NSD). One of a series of directives that has been used to announce Presidential decisions implementing national policy objectives in all areas of national security. The national security directive term was used during the Bush Administration. All NSDs in this series were individually identified by number and signed by the President. See Presidential Directive, Nuclear Weapons Employment Policy.

National Strategic Target List (NSTL). A listing of all installations of strategic targeting importance. Now called the National Target Base (NTB).

National Target Base (NTB). The STRATCOM produced and maintained authoritative file of target installations which, individually and collectively, meet the requirements for achieving the national targeting objectives specified in national, Secretary of Defense and JCS guidance, and STRATCOM internal directives. The NTB includes targets intended to be attacked in specific SIOPs, in the theater nuclear employment plans of the unified commands, and for prospective contingencies. Some 18,000 installations were in the NTB in 1995. Targets in the former Soviet Union, China, and North Korea are known to be part of the NTB.

Based upon the Target Data Inventory (TDI) of some 18,000 installations and locations, the NTB is selected used “selection filters” geared to national and STRATCOM internal guidance. This is largely a computerized selection process based upon categorization of targets by functional categories. Individual attention is given to an installation when it meets the selection filter criteria but for other reasons is not targeted.

Three NTB structures are maintained: Major Attack Options (MAO), Limited Attack Options (LAO), and the Nuclear Reserve Force (NRF). STRATCOM publishes NTB and related products including the NTB Data Dictionary and the Selection Criteria Manual. Construction of the NTB is an ongoing activity, with continual coding validation and target island/DGZ construction for SIOP weapons and options. Construction of the NTB is accomplished on two computer systems, the Intelligence Data Handling System (IDHS-90) and the TRIAD Computer System (TRICOMS).

National Target Base Server (NTBS). Strategic Warfare Planning System Enterprise Database (SWPS-EDB) system that supports STRATCOM/J5 in selecting, prioritizing, and coding target installations according to SIOP attack options, as specified in national and JCS guidance. NTBS provides rules-based software for the creation of the National Target Base (NTB). Information is currently compiled on NTBS and passed to the Target Planning System (TPS) as ITFs via the EISI Guard processor. NTBS draws information from the Modernized Integrated Database (MIDB) and CADOB, and interfaces with the SWPS via EISI Guard, STIFF, and GEMS via JWICS. NTBS will replace some aspects of the MIDB relating to coding installations with a significance code. NIDS-II will include a reengineering of the rule-based part of NTBS and TPS functions and processes and provide geodetic coordinate data, STRATLEAD, and airfield elements in support of target development and maintenance of the NTB.

National Wargaming System (NWARS). STRATCOM system used to simulate war games including SIOP execution.

NATO Nuclear Planning System (NNPS). NATO force level nuclear operations planning system. Provides the capability to load data from external commands and agencies; develop Major Contingency Options and Selective Contingency Option plans (target development, DGZ construction, force application, aircraft route planning, timing and deconfliction, and consequences of execution); and prepare planning products and messages for external commands and agencies. Initially designed by the DSWA and SAIC. Also called the SHAPE Nuclear

Planning System (NPS). (STRATCOM, “STRATCOM Targeting, Analysis, and Mission Planning Support Study,” January 1998 (Revised March 1998), p. 30, released under the FOIA).

NDL Integrated Development System (NIDS). See National Desired Ground Zero (DGZ) List (NDL) Integrated Development System (NIDS).

NDL Maintenance. Strategic Warfare Planning System application.

network analysis. Identification of key installations in a network, such as transportation, communications, or electricity, to optimize attacks.

Non-SIOP Option (NSO). An option planned by STRATCOM based upon a subset of nuclear forces set aside from use in SIOP Major Attack Options (MAOs). These forces would be available before or after implementation of the MAO, for attacks against China and/or other nations with “coercive nuclear power.” The NSO is believed to have been eliminated in early 1998.

Non-Strategic Nuclear Forces (NSNF). Those nuclear-capable forces located in an area of military operations with a capability to employ nuclear weapons by land, sea, or air forces against opposing forces, supporting installations, or facilities. Such forces may be employed, when authorized by competent authority, to support operations that contribute to the accomplishment of the commander’s mission within the theater of operations. The categorizations of NSNFs include: (1) dual-capable aircraft (DCA), land-based nuclear-capable aircraft with less than intercontinental range; and (2) nuclear-armed Tomahawk land-attack cruise missiles (TLAM/N), sea-based nuclear systems with less than intercontinental range that are used to strike targets ashore. (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-15, partially declassified and released under the FOIA).

NTB Data Dictionary. A STRATCOM developed manual to define and list the allowed values for data fields of the National Target Database (NTB) files.

NTB Maintenance. Strategic Warfare Planning System application.

NTB Production (N205). STRATCOM system slated to be eliminated.

NTB Selection Criteria Manual. A STRATCOM developed manual to document target selection criteria and define target option eligibility and other required coding for installations in the National Target Base (NTB). The manual describes, in detail, the relevant target categories to be included in the NTB.

NTB Workstation. A new graphical display terminal integrating target information and tools for first-order analysis of critical network nodes. The Workstation includes the Relocatable Target Assessment and Planning System (RTAPS), FULCRUM, a spreadsheet for ITANs, STRATLEADs (Strategic List of Enemy Activations/Deactivations), etc., with access to the TRIAD Computer System (TRICOMS) and the Intelligence Data Handling System (IDHS). The Workstation includes the ability to display targets worldwide with their target characteristics on

Arc Digitized Raster Graphic (ADRG) maps, verify airfield elements, and perform boundary checking for regional targeting. For network analysis, the software displays a series of networks such as electric power, POL supply lines, rail lines and roads simultaneously to assist in selectively targeting military operations such as airfields.

nuclear CINC. One of the commanders-in-chief of the Unified Commands designated with nuclear war contingency planning responsibility, specifically CINC, Atlantic Command (ACOM); CINC, Central Command (CENTCOM); CINC, European Command (EUCOM); CINC, Pacific Command (PACOM); and CINC, Strategic Command (STRATCOM).

Nuclear Command & Control System Enterprise Database (NC² EDB). The NC² System protects data within the Strategic War Planning Systems Enterprise Database (SWPS-EDB) used in the production of the SIOP. It protects EDB timing data from tampering and compromise.

nuclear damage assessment. The determination of the damage effects to the population, forces, and resources resulting from actual nuclear attack. It is performed during the trans-attack and post-attack periods. It does not include the function of evaluating the operational significance of nuclear damage assessments.

nuclear effects. The immediate and prolonged effects of nuclear detonations, made up of four basic nuclear weapon damage mechanisms (blast, thermal radiation, nuclear radiation, and electromagnetic phenomena). The immediate phenomena associated with a nuclear explosion vary with the spatial location of the burst in relation to the target. The main types of bursts are subsurface, surface, air, high altitude, and exo-atmospheric. Specific nuclear effects data for each weapon in the U.S. arsenal are contained in *Nuclear Weapons Employment Effects Data*, Joint Pub 3-12.2. Calculating nuclear effects for SIOP planning include Measures of effectiveness (MOEs) (e.g., damage expectancy and target coverage) and effects on population and damage mechanisms:

Effects on Population

- Fallout.
- Fatalities.
- Injuries.

Damage Mechanisms

- Blast/Overpressure.
- Radiation.
- Ground shock.
- Cratering/Debris.
- Electromagnetic pulse (EMP).
- Thermal.

Nuclear Execution Reporting Plan (NERP). Trans- and post-SIOP national reporting requirements and reports.

nuclear forces. One of four target categories in the "four-category targeting strategy," including land-based missiles together with their launch facilities (Lfs) and launch command centers (LCCs), nuclear weapons storage sites, airfields support nuclear-capable aircraft, and ballistic missile submarine bases. See also leadership, conventional forces, economic and industrial

targets.

Nuclear Immediate Photo Interpretation Report. Message that provides interpretation results from post-SIOP reconnaissance. It contains information on gross damage levels to objective installations or observed damage at other locations. Also known as Nuclear Initial Photo Interpretation Report.

Nuclear Planning and Execution System (NPES). A nationally directed and maintained command and control system that provides the National Command Authorities and all nuclear CINCs with timely decision-making information on the status of forces/resources in the pre-attack through reconstitution phases of a nuclear war. NPES supports strategic and non-strategic nuclear planning, executing, termination, and reconstitution. The decision-oriented information is derived from a variety of national and nuclear CINC reports and databases, as well as near-real-time satellite and signals intelligence data. NPES is directly connected to numerous communications systems to support automatic database updating and display generation (e.g, DSP, GCCS, NEREP (ForGen), NDS, JRS, NBCWRS, WINDS). SIOP data is received from the Strategic Warfare Planning System . Because of the communication links, NPES in theory provides timely force status information and residual capability data both in peacetime and in crisis. The generation of nuclear war plans is another component of the system. This includes support to CINC preplanned options as well as ad-hoc planning during crises and the trans-/post-nuclear time periods.

NPES operates in a variety of environments including fixed command centers, the National Airborne Operations Center (NAOC), and other mobile platforms. Key players participating in NPES include: the Joint Staff, the Strategic Command, the nuclear CINCs, the Defense Intelligence Agency (DIA), the Defense Special Weapons Agency (DSWA), and the other Unified Commands. A fully functional NPES facilitates elimination of the Single Integrated Database (SIDA) and integrated Force Monitoring Information System (FMIS) functionality. The Nuclear Planning and Execution System — Client/Server (NPES C/S) will replace the current system, called NPES-II. NPES C/S will continue to utilize the SIDA tape from TRICOMS until the SWPS-EDB can fully support the system. The NPES C/S vendor is Oracle.

Nuclear Planning System (NPS). U.S.-only nuclear planning system formerly used by regional unified commands for theater nuclear operations.

Nuclear Reserve Force (NRF). Reserve force of strategic and non-strategic nuclear capabilities.

The term is sometimes loosely also applied to the Secure Reserve Force (SRF) (sometimes also called the Strategic Reserve Force (SRF)) but has a more specific meaning. According to the JSCP Nuclear Supplement, the NRF consist of the Secure Reserve Force (SRF) and Residual Forces, with the SRF consisting of SLBMs and bombers not called for to be used in a particular Major Attack Option. Residual forces are made up of strategic and non-strategic nuclear forces, with the former consisting of recovered/reconstituted, uncommitted, and unexecuted forces. Non-strategic Residual Forces, in turn, consist of uncommitted and not NATO designated nuclear forces. (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. D-26, partially declassified and released under the FOIA).

Nuclear Utility Calculation System (NUCS). Strategic Warfare Planning System program that computes nuclear effects. The program is moving to a workstation and will be a driver for existing software that calculates nuclear effects, including PDCALC (Probability of Damage Calculator), FAS/CIVIC, Persistent Environmental and Aircraft Response Model (PEARL), FM 101-31, and other models maintained by the Defense Special Weapons Agency. NUCS in its final configuration will allow STRATCOM to calculate a wide variety of nuclear effects to include not only nuclear weapons but also consequences of damage to nuclear facilities such as nuclear power plants.

Nuclear Weapon Employment Policy (NUWEP). Secretary of Defense-approved document—formally called the “Policy Guidance for the Employment of Nuclear Weapons”—that provides the definitive civilian oversight responsibility for SIOP preparation, guidance and review. In particular, the NUWEP provides collateral damage guidelines relating to fatalities and other damage caused as a result of implementation of the SIOP.

The NUWEP originates with NSDM-242, and a document, called NUWEP-1, signed in November 1974, stayed in existence through October 1980, when Secretary of Defense Harold Brown issued NUWEP-2 (or NUWEP-80). In July 1982, Secretary of Defense Caspar Weinberger issued NUWEP-82, replacing NUWEP-80. From then on, the NUWEP was issued on a biennial basis. The latest NUWEP is dated 17 November 1992.

In January 1991, Secretary of Defense Cheney, based upon a comprehensive post-Cold War SIOP Targeting Review, directed major SIOP 93 changes. The SIOP went to a single timing plan, and there was a reduction in the number of warheads called for in various attack options, as well as some 2,500 fewer targets in various categories due to the break-up of the Soviet Union. A new Secretary of Defense NUWEP (NUWEP-92) was formally implemented on 1 November 1992 based upon the rapid changes in U.S.-Russian relations. It in turn resulted in a completely rewritten Joint Strategic Capabilities Plan (JSCP) Annex C, which was issued in the Spring of 1993. This NUWEP was the major innovation at the end of the Cold War, though there have been numerous ad hoc and incremental changes in national guidance since 1990 to keep pace with declining U.S. and Soviet/Russian forces and changes in the target base. See also guidance.

nuclear yield. The energy released in the detonation of a nuclear weapon, measured in terms of the kilotons or megatons of TNT required to produce the same energy release. Yields are categorized as:

- Very low: less than 1 kiloton.
- Low: 1 kiloton to 10 kilotons.
- Medium: over 10 kilotons to 50 kilotons.
- High: over 50 kilotons to 500 kilotons.
- Very high: over 500 kilotons.

(Joint Pub 1-02)

NUWEP Reconnaissance List. 1. An overview of strike assessment planning necessary to determine the results of U.S. and allied nuclear strikes in support of the SIOP and preplanned Theater Nuclear Options (TNOs). (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. H-7,

partially declassified and released under the FOIA). 2. Nuclear Weapons Reconnaissance List (NRL) (N211). STRATCOM system slated to be eliminated.

offset. “DGZ offset may achieve the desired weapon effects while avoiding collateral damage.” (JCS, *Doctrine for Joint Theater Nuclear Operations*, Joint Pub 3-12.1, p. III-3.)

offset aim point (OAP). 1. A point that is significant either visually or on radar to assist pilots in finding and hitting their targets. 2. The radar significant ground fix point used in the offset bombing mode. 3. Element of the Missile Target Materials Program.

offset bombing. Any bombing procedure which employs a reference or aiming point rather than the actual target to guide in the release of weapons. This type of bombing is employed when the target cannot be seen or is itself a poor reference point.

operation order (OPORD). A directive issued by a commander to subordinate commanders for the purpose of effecting the coordinated execution of an operation. (Joint Pub 1-02)

operation plan (OPLAN). Any plan, except for the Single Integrated Operation Plan, for the conduct of military operations.

Operations Analysis Strategic Interactive Simulator/Footprint (OASIS/FTPRT). Strategic Warfare Planning System application that models employment tactics for ICBMs and SLBMs.

option. Planning options for the use of nuclear forces derived from the Joint Strategic Capabilities Plan (JSCP). There are two generic options: Major Attack Options (MAOs) and Limited Attack Options (LAOs). Specific MAOs with separate targeting schemes are numbered. Adaptive Planning Options (APOs) are not considered to be either MAOs or LAOs. Also known as attack option. The other SIOP options currently in use are believed to include:

- Basic Attack Options (BAOs),
- Directed Planning Option (DPO),
- Non-SIOP Option (NSO),
- Regional Nuclear Options (RNOs), and
- Selected Attack Options (SAOs).

Theater Nuclear Options (TNOs), though utilizing strategic and non-strategic nuclear forces, are not a part of the SIOP. See also Limited Nuclear Options (LNOs).

ORCA Planning and Utility System (OPUS). RISOP-related planning and utility software maintained by Orca, a private contractor. It is used with the Arsenal Exchange Model (AEM) and Front-end/Back-end Processors for the AEM (FROBAK).

Other military targets (OMT). Term which refers to military targets which are not a part of the nuclear force or in the leadership categories.

P-95 circle. A circle encompassing 95 percent of the nighttime population of a city or urban area and used in Consequences of Execution (C of E) analysis for estimating the effect of the SIOP. Specific criteria, including maximal and minimal limits in the size of P-95 circles and the minimal population to be included in the circles, are prescribed in DIA’s Geographic Installation

Intelligence Production Specification (GIIPS). For computational purposes, the distribution of the population within the circle is assumed to be circular normal. (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-15, partially declassified and released under the FOIA).

peak overpressure. The maximum value of overpressure at a given location which is generally experienced at the instant the shock (or blast) wave reaches that location.

peak pressure. The measure of the maximum force exerted against an object by a blast wave and equals the pressure exerted multiplied by the area over which it acts.

Persistent Environmental and Aircraft Response Model (PEARL). DNA-developed and DSWA-maintained fratricide program which evaluates dust and debris ingestion for air breathing platforms (bombers and cruise missiles) in a nuclear war.

Physical Vulnerability (PV) Data Sheets. A document that provide complete physical vulnerability information for installations contained in the Geographic Installation Intelligence Production Specifications (GIIPS) whose vulnerability cannot be accurately coded using the vulnerability number (VN) system. The vulnerability information is presented as adjusted vulnerability numbers for use with specific yields of nuclear weapons and in the form of mathematical equations which can be readily adapted to computer use. See vulnerability number (VN).

Physical Vulnerability Handbook for Nuclear Weapons (OGA-2800-23-YR). A standard DIA manual relating to the use of nuclear weapons. It is intended for use by operational planners, targeting personnel, and physical vulnerability analysts who are concerned with the delivery of nuclear weapons and the prediction of their effects.

plan analysis. Post-production evaluation stage of the SIOP which includes consequences of execution (C of E) and wargaming analysis.

point target. 1. A target with an area defined by a center point, a major and minor axis, and a target azimuth. 2. A target where the target itself equals the aim point; it is encompassed in a small area with respect to the attacking or striking systems, delivery accuracy, and munitions effects.

Point Target Ellipse (PTE). Element of the Missile Target Materials Program. See Global Reconnaissance Support (GRS)/Point Target Ellipse (PTE).

Portable Missile & Aircraft Replanning System (PMARS). Program used to determine if a given sortie (bomber or missile) has sufficient fuel/range to get from point A to point B. Airborne battlestaffs use the program to get a (very) rough estimate of whether a mission is feasible using a certain sortie against a designated target. The system has data hard coded into it, along with achievability algorithms. The vendor is Alsys, Inc. PMARS is being replaced by the Nuclear Planning and Execution System (NPES).

post-SIOP. The time period after completion of implementation of the SIOP, including all

strikes and restrikes. See also trans-SIOP.

precautionary launch. The launching of nuclear loaded aircraft under imminent nuclear attack so as to preclude friendly aircraft destruction and loss of weapons on the ground or carrier.

precursor. (Nuclear) A pressure wave which precedes the main blast wave of a nuclear explosion.

pre-ignition. (Nuclear) “The loss of a nuclear warhead from the effects of another warhead due to improper timing or spacing.” (JCS, *Doctrine for Joint Theater Nuclear Operations*, Joint Pub 3-12.1, p. GL-4.)

Pre-Launch Survivability (PLS). SIOP planning factor for forces. The JSCP Nuclear Supplement defines PLS as “The probability that a delivery vehicle survive an enemy attack and be available for execution.” (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. GL-16, partially declassified and released under the FOIA).

preplanned missions. Those missions for which a requirement can be foreseen, thereby permitting detailed planning and coordination.

preplanned options. “A means of maintaining centralized control while minimizing the impact on response time. These options should be capable of being executed individually or in combination with other options to expand the attack either functionally or geographically.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-6.)

presidential directive. 1. The generic term for a document that announces Presidential decisions implementing national policy objectives in all areas of national security. Each administration since the beginning of the Cold War has generated specific names for the directives issued during their tenure:

- National Security Decision Memoranda (NSDM): Nixon/Ford Administrations.
- Presidential Directive (PD): Carter Administration.
- National Security Decision Directive (NSDD): Reagan Administration.
- National Security Directive (NSD): Bush Administration.
- Presidential Decision Directive (PDD): Clinton Administration.

2. (Presidential Directive) One of a series of directives that has been used to announce Presidential decisions implementing national policy objectives in all areas of national security. The Presidential Directive (PD) term was used during the Carter Administration. PD-59 (“Nuclear Weapons Employment Policy”), signed 25 June 1980, replaced NSDM-242 of the Nixon administration. It in turn was replaced by NSDD-13 of the Reagan Administration. All PDs in this series were individually identified by number and signed by the President.

Presidential Decision Directive (PDD). One of a series of directives that has been used to announce Presidential decisions implementing national policy objectives in all areas of national security. The Presidential Decision Directive term is being used during the Clinton Administration. All PDDs in this series are individually identified by number and signed by the President. Current nuclear weapons policy is derived from Presidential Decision Directive 60

(PDD-60), signed by President Clinton in November 1997. PDD-60 replaced National Security Decision Directive 13 ("Nuclear Weapons Employment Policy"), signed in October 1981 by President Reagan. See guidance.

Presidential Decision Handbook. The decision tool prepared by STRATCOM and the JCS/J3 and used by the President, the Secretary of Defense, the Chairman of the Joint Chiefs of Staff, the JCS, the nuclear CINCs, and other SIOP advisors to understand SIOP options and the consequences of implementing nuclear war plans. Also known as the "Gold Book." Formerly called the SIOP Decision Handbook (the "Black Book").

Probability of Arrival (PA). Weapon system arrival calculation. The JSCP Nuclear Supplement defines PA as "the probability that the weapon will successfully arrive and detonate in the target area as planned. PA is typically broken down into components, including PLS [pre-launch survivability], WSR [weapon system reliability], and PTP [probability to penetrate]." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-16, partially declassified and released under the FOIA).

Probability of Damage (PD). Weapon damage calculation, the probability that damage will occur to a target expressed as a percentage or as a decimal. The JSCP Nuclear Supplement defines PD as "the probability that an arriving weapon with a given yield, circular error probable (CEP), height of burst (HOB), and displacement from a target or set of targets will achieve at least the specified degree of damage to the target. The target is characterized by type, size, and vulnerability to weapon effects." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-16, partially declassified and released under the FOIA).

Probability of Damage Calculator (PDCALC). Model to calculate damage from a nuclear weapon. The application is part of the Allocated Windows Planning System (AWPS).

Probability of Damage Look Up (PDLookUp). A SIOP planning tool that provides DGZ construction personnel and targeters with two reports. The first calculates the Probability of Damage (PD) for various weapons and various Vulnerability Numbers (VNs) with a target type and K-factor (called a VNTK) in 1/10th mile increments from 0 to 2 nautical miles. The second report shows all DGZs and all the associated installations sorted by Target DGZ Designator (TDD). It is used to cross-reference the PDs by weapon for a VNTK to a particular installation.

Probability of Kill (PK). Conventional damage calculation.

Probability of perishability. The likelihood that a target has changed significantly within the time parameters of the established targeting time period.

Probability to Penetrate (PTP). Weapon arrival calculation.

prohibited target. A target category "prohibited from attack in specific options." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. C-6, partially declassified and released under the FOIA).

Project Blue Light. Adaptive planning experiment undertaken in 1994.

prompt nuclear effects. The blast, thermal effects, and initial nuclear radiation resulting from a nuclear detonation that causes personnel casualties and fatalities and material damage. Thermal and radiation effects, though present, are not yet considered in assessing material damage. All three effects (blast, thermal, and radiation) are used to calculate population at risk (PAR) and casualties. (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. GL-16, partially declassified and released under the FOIA).

Population at Risk (PAR). Damage calculation measure.

preplanned nuclear response. An attack option defined as "selection of appropriate targets, assignment of weapons, and procedures for execution at Presidential direction." (STRATCOM, "SIOP Target Review," 1 November 1996, p. M-4, partially declassified and released under the FOIA).

Quick Aimpoint Generator (QAG). Survivable Adaptable Planning Experiment (SAPE) DGZ graph heuristic algorithm construction tool.

Radar Directed Gun-System Simulation (RADGUNS). Analysis model, introduced in 1985, used to evaluate the effectiveness of anti-aircraft artillery (AAA) systems against aerial platforms.

radar fix point (RFP). Element of the Missile Target Materials Program. The Radar Fix Point (RFP) software processes and maintains data obtained from the 97th Intelligence Squadron, to be managed on the Strategic War Planning System and used in the production of the SIOP. The RFP input file contains a list of the current radar fixed points by which planners designate the final launch point fixes for SIOP application.

RAILS. Relocatable target planning system.

RAINGR. Application that is part of the Allocated Windows Planning System (AWPS).

Radar Significant Power Line (RSPL). A power transmission line which, because of its unique physical characteristics and/or voltage capacity, is known to possess radar reflective qualities, and is therefore distinctively displayed on a target graphic.

radial error. An error associated with delivery of munitions on a target. It is the distance between the desired point of impact and actual point of impact, both points projected and measured on an imaginary plane drawn perpendicularly to the flight path of the munition.

radius of damage. The distance from ground zero at which there is a 0.50 probability of achieving the desired damage.

radius of safety. The horizontal distance from ground zero beyond which the weapon effects on friendly troops are acceptable.

rainout. Radioactive material in the atmosphere brought down by precipitation.

Rapid Execution and Combat Targeting System (REACT). Minuteman launch control system integrating all aspects of monitoring and executing controls over the land-based missile force from a single console located in launch control centers (LCCs). REACT, which was designed to increase the hardness and survivability of the LCC and modernize and harden LCC equipment, allows updated processing of emergency action messages (EAM), and targeting and retargeting of the missile force. REACT allows for the targeting of mobile targets by the Minuteman force by reducing timelines by 50 percent (to some 15 minutes). (AFSPC, "Rapid Execution and Combat Targeting (REACT) System Operational Requirements Document," 15 March 1994, partially declassified and released under the FOIA).

Rapid Production Model (RPM). Strategic Warfare Planning System planning tool, originally introduced in 1977, and developed by the Joint Strategic Target Planning Staff to provide the capability for concise, detailed study of strategic force exchanges. The model is not dynamic; the output data consists of computer printouts of direct and collateral damage and fallout casualties. The code is unclassified. Versions are constantly being upgraded.

Readiness Evaluation, Assessment and Decision-making Information System (READI). READI provides the CINC and other senior STRATCOM leaders with the daily status of SIOP assets. The system is being used as a briefing platform to the senior leaders to give them a concise overview of the status of forces. READI accomplishes this by presenting a series of views that provide the user with "drill-down" capability for data housed within the Command and Control Enterprise Database (C²-EDB). The vendors include IBM, ISI, Grafpoint, Linguist's Software, Inc, Distinct Corp, DEC, Hewlett Packard, Borland International, Oracle, Intersolv, Inc., Western Digital, Fahrenheit, Helio Computers, Inc., and TerraView.

Reconnaissance Planning System (RPS). A graphical user interface to the data (and the functions performed on the data) used in the reconnaissance planning process. RPS produces the Defense Intelligence Agency (DIA) Adds and Deletes Data File, the 9th Intelligence Squadron Collection Objectives, the JCS Data File, three data files for the National Security Agency and one data file for the Combined Mating and Ranging Planning System (CMARPS). RPS also loads data received from the NSA and CMARPS to the Strategic War Planning Systems Enterprise Database (SWPS-EDB). Much of this data is used by Document Production, which produce the Electronic Intelligence (ELINT) Tab to the Nuclear Weapons Employment Policy (NUWEP) Reconnaissance List, as well as route books for reconnaissance aircraft.

Red Integrated Strategic Offensive Plan (RISOP). A Joint Staff-approved hypothetical Russian strategic war plan established during the Cold War, whose primary purpose is to provide an evaluation tool for testing SIOP effectiveness through computer simulation. The RISOP does not represent a judgement by the JCS or STRATCOM regarding Russian geopolitical intentions or the most likely war-initiation scenarios. It is used in annual SIOP war games. RISOP production relies upon the Arsenal Exchange Model (AEM), FROBAK, and OPUS. Blue installation data is received from JRADS.

Red Planning Board. A group, chaired by the JCS/J-8, which provides an estimate of the

Russian nuclear capability via the Red Integrated Strategic Offensive Plan (RISOP).

Red Strategic Target Data Base (RSTDB). A database of U.S. targets managed by STRATCOM for use in the Red Integrated Strategic Offensive Plan (RISOP).

reflected shock wave. When a shock wave traveling in a medium strikes the interface between this medium and a denser medium, part of the energy of the shock wave in the denser medium and the remainder of the energy results in the formation of a reflected shock wave which travels back through the less dense medium.

Regional Nuclear Option (RNO). SIOP option from the 1970-1980 time-frame, but believed no longer to be used (and replaced by the Basic Attack Option (BAO) or Selected Attack Option (SAO). RNOs were described as attacks “intended, for example, to destroy the leading elements of an attacking force.” (*Department of Defense Annual Report Fiscal Year 1980*, p. 85).

release. Presidential authorization to use nuclear weapons.

relocatable target (RT). See Strategic Relocatable Target (SRT).

Relocatable Target Assessment and Planning System (RTAPS). A system devised by DIA to identify likely operational areas for relocatable targets. Replaced the Relocatable Target Adaptive Planning System.

Relocatable Target Assessment Data (RTAD). NIMA digital data sets of attributed and non-symbolized feature information segregated into thematic files portraying roads, railroads, vegetation, surface drainage, and limited surface materials which can be combined into three separate levels of data. All three levels use standard DTED Level 1 to determine elevation, slope, and intervisibility and are intended to be used with multispectral or electro-optical image products. RTAD is used to assess potential target locations of mobile systems.

Reserve Forces Target List (RFTL). SIOP reserve force target list.

Residual Capability Assessment (RECA). Post-SIOP continental United States reporting structure to assess damage and effects of a nuclear war on the United States.

residual radiation. Nuclear radiation caused by fallout, radioactive material dispersed artificially, or irradiation which results from a nuclear explosion and persists longer than one minute after burst.

risk dose. The radiation dose deemed acceptable by the Chairman of the Joint Chiefs of Staff and specified in the JSCP. (CJCS/J-5, “Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96),” CJCSI 3110.04, 12 February 1996, p. H-18, partially declassified and released under the FOIA).

Route Analysis and Penetration Evaluation System (ROPES). Strategic Warfare Planning System application, a deterministic (expected value) aircraft and cruise missile model which

computes the probability of arrival for a given route in a defensive environment. The system is slated to be eliminated. See also GROPEs (Graphical Route Analysis and Penetration Evaluation System).

rural cell data. Population estimates for areas geographically divided into rectangles circumscribed by a specific number of minutes of longitude and latitude. For computational purposes, the distribution of population within these cells is assumed to be uniform. Rural cell data is used by DISA in SIOP analysis. (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. H-18, partially declassified and released under the FOIA).

SACEUR Major Contingency Options (MCO). Supreme Allied Commander Europe (NATO) nuclear weapons plans. See also NATO Nuclear Planning System.

SACEUR Scheduled Strike Program. Now called SACEUR Major Contingency Options (MCO).

SACEUR Selected Contingency Option (SCO). Supreme Allied Command Europe (NATO) nuclear weapons plans. See also NATO Nuclear Planning System.

safe burst height. In non-strategic nuclear planning, the height of burst at or above which the level of fallout, or damage to ground installations is at a predetermined level acceptable to the military commander.

safe passage. Bomber term.

scheduled target. A planned target on which a nuclear weapon is to be delivered at a specified time during an operation. The time is specified in minutes before or after a designated time or in terms of the accomplishment of a predetermined movement or task.

SD. Solution database file, a component of the Strategic Warfare Planning System.

Secure Reserve Force (SRF). Better known as the Nuclear Reserve Force (NRF), a subset of strategic and non-strategic nuclear forces, primarily made up of sea-based forces, formally created in the 1980-1981 time-frame. These are either forces withheld from use in Major Attack Options (MAOs) or those surviving bombers and submarine-based forces in transit at the time of SIOP execution that would be available in the trans- and post-SIOP time period. The forces included are those assessed as able to survive a nuclear war.

“Since naval forces at sea will be the most likely military forces to survive a general nuclear exchange, they will be highly important as command and control centers and as the primary residual organized combat elements capable of conducting the war during the period when other U.S. military forces are being reconstituted. They will conduct sea, air, and amphibious operations against the enemy's residual military capabilities following the nuclear exchange, using remaining nuclear and/or conventional weapons, and assist in forcing a conclusion of hostilities advantageous to the U.S.”

(Department of the Navy, *Nuclear Warfare Operations*, NWP 28 (Rev. D), November 1980, p.

1-2; partially declassified and released under the FOIA).

Options for the SRF are directed in the Joint Strategic Capabilities Plan (JSCP). Sometime also called the Strategic Reserve Force (SRF). See also Nuclear Reserve Force (NRF).

Selected Attack Option (SAO). A now defunct SIOP nuclear counterforce option, with a target subset of opposing nuclear forces and supporting command and control. At one point, this option was a Minuteman-only launch under attack. Later, the SAO was eliminated and the option became largely subsumed by MAO 1.

Silver Book (Strategic Installation List and Vulnerability Effectiveness Results). Selected contingency targeting planning project initiated by SAC/STRATCOM in 1991 to conduct nuclear planning and targeting on behalf of the regional unified commands. After some of those commands complained that STRATCOM was seeking to supplant their statutory responsibility, the Silver Book project was canceled. STRATCOM instead was charged with providing assistance and expertise to the other unified commands in the selection of targets and planning process.

Single Integrated Damage Analysis Capability (SIDAC). Analysis model, first introduced in 1974, consisting of a number of models and numerical routines to calculate the effects of nuclear weapons on specified targets (prompt blast, initial radiation and thermal radiation; and residual fallout).

Single Integrated Database (SIDA). National-level database with integrated information about force status used for trans- and post-SIOP crisis planning as part of the Nuclear Planning and Execution System (NPES). SIDA was maintained at the Joint Coordination Center (JCC) located at Site R, the JCS emergency command post near Ft. Ritchie, Maryland until 1994, when it was transferred to Offutt AFB. (The JCC function was also transferred to STRATCOM upon its activation.) STRATCOM now prepares the SIDA and sends tapes to the JCC. The SIDA consolidates information pertaining to nuclear force status, emergency action message processing and nuclear planning and execution through connectivity with the Strategic War Planning Systems Enterprise Database (SWPS-EDB). It provides the National Command Authorities, Joints Chiefs of Staff, and the nuclear CINCs an automated application which outlines the latest force readiness information on bombers, tankers, missiles, and submarines in support of all pre-planned nuclear strikes in the SIOP. SIDA functionality is programmed to be subsumed by NPES in the FY99 time-frame.

Single Integrated Operational Plan (SIOP). The central strategic nuclear war operations plan of the United States, first drawn up in 1960. The SIOP is not one plan or one attack option, but a set of plans and a series of options constructed from a single set of targets contained in the National Target Base (NTB) and based upon a single set of forces. The set of targets reportedly equaled some 12,500 at the end of the Cold War. Not all targets are to be hit under every option, and many targets are so geographically close together as to allow them to be destroyed by a single nuclear weapon (and within a circle called a desired ground zero (DGZ)). Some targets, because of their hardness, however, such as missile launching silos, are also assessed as requiring attack by more than one weapon.

The SIOP planning process is a series of stages, consisting of major functional areas steps referred to as target development; DGZ construction; assignment (combining steps previously referred to separately as weapon allocation, weapon application, and timing and deconfliction); reconnaissance planning; analysis; and document production. The process traditionally took 14 to 18 months to accomplish (the timeline for SIOP 94 was 67 weeks). The Strategic Planning Study and the new Strategic Warfare Planning System is streamlining the process to reduce the time-line by as much as two-thirds.

SIOPs are currently named for the fiscal year they enter into force. Prior to SIOP-93, SIOP naming was based on an alphanumeric system tied to the Presidential decision document in effect on the day of plan implementation. The last SIOP plan under this numbering system was designated SIOP-6, Revision H, or SIOP-6H. In FY 1993, the fiscal year numbering system went into effect. The first SIOP under this numbering system was SIOP 93, which was rushed into effect three months early in June 1992. At about this time, General George “Lee” Butler, then CINCSTRAT, attempted to change the name of the SIOP to the National Strategic Targeting Plan (NSTP) to more reflect the existence of a “family” of plans, but the name change was ultimately rejected.

During the 1990s, the pattern has been for a new SIOP to be implemented once a year, normally entering into force with the new fiscal year (October 1). Accordingly, SIOP-99 entered into force on 1 October 1998 at the beginning of FY 1999. If a new plan is required more than once a year, it is to be identified by sequentially attaching a letter to the year (e.g., SIOP-99A).

The various recent SIOPs (and date of implementation) are:

- SIOP-5, 1 January 1976.
- SIOP-6, 1 October 1983.
- SIOP-6F, 1 January 1989.
- SIOP-6G, 1 October 1990.
- SIOP-6H, 1 October 1991.
- SIOP-92, 1 October 1991.
- SIOP-93, 1 June 1992.
- SIOP-94, 1 October 1993.
- SIOP-95, 1 October 1994.
- SIOP-96, 1 October 1995.
- SIOP-97, 1 October 1996.
- SIOP-98, 1 October 1997.
- SIOP-99, 1 October 1998.

See also Living SIOP, Nuclear Operations Plan (NOP), Nuclear Weapons Employment Policy (NUWEP), options, targets.

(SSPD). The statistical likelihood of achieving a stated damage criterion against a target with a single weapon.

SIOP Data Input (SDI). System used to transfer SIOP data from the Strategic Warfare Planning System Enterprise Database (SWPS-EDB) to the Command and Control Enterprise Database (C²-EDB).

SIOP Decision Handbook (Black Book). Former name for the decision tool prepared by the JCS/J3 and used by the President and Secretary of Defense, the JCS, the nuclear CINCs, and other SIOP advisors. Now called the Presidential Decision Handbook.

SIOP ESI. Codeword marking classified national security “extremely sensitive information” dealing with the SIOP and nuclear war planning and execution.

SIOP maintenance. The upkeep of a finished SIOP until the next major revision or plan. Maintenance includes immediate, priority, and routine changes. Routine changes, primarily as a result of changes to the target data in the Integrated Database/Modernized Integrated Database (IDB/MIDB) are processed using a mechanism known as the Deletes, Adds and Changes List (DACHL). From January to May 1993 for SIOP-94, there were approximately 250 SLBM sorties changes, 116 ICBM sorties changes, and 20 aircraft sortie changes resulting in 20 cruise missile sorties changes.

SIOP Mating and Ranging Program (SMARP). Strategic Warfare Planning System planning tool that mates bombers and aerial refueling tankers to meet mission fuel demands. Has no capability south of the equator.

SIOP Monitoring System (SIMON). A DOS-based, mission critical program that provides STRATCOM, national, and airborne command post battlestaffs the ability to track the status of forces in a pre-, trans-, and post-SIOP environments through the use of Nuclear Execution Reporting Plan (NEREP) messages. The data carried in SIMON is used to provide the NCA the information required to make decisions during periods when ground based command centers may be incommunicado. SIMON was the first nationally approved command and control system written entirely in Ada (approximately 112K lines). SIMON uses a pseudo-relational database containing Top Secret SIOP/ESI data. The vendor is Alsys, Inc. It is scheduled to be replaced by the Nuclear Planning and Execution System (NPES).

SIOP Reconnaissance Plan (A101F). System slated to be eliminated.

SIOP Revision Report. A report which accompanies each new SIOP, outlining changes compared with the previous SIOP. This report is the decision briefing presented to the Chairman of the Joint Chiefs of Staff and Secretary of Defense for approval of the new SIOP.

SIOP Strike Assessment System (SAS). Application used by reconnaissance units in SIOP planning. (STRATCOM/J66, “U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. xii, partially declassified and released under FOIA).

SIOP Support Program (SSP). Program responsible for unifying and enhancing a wide variety of DOD intelligence support activities associated with U.S. strategic nuclear targeting, and for consolidating and prioritizing intelligence support requirements to the SIOP. The SSP Coordinating Committee, composed of representatives from DIA, the Joint Staff, OSD, and STRATCOM, serve as the focal point for program activities. See also SSP Production Plan.

SIOP Tanker Analysis Model (STAM). Model developed by Boeing and introduced in 1985 to

determine tanker requirements for the refueling support of bomber sorties in a SIOP mission. The code is unclassified.

SIOP Target Review. Study conducted at the direction of Admiral H.G. Chiles, CINC STRATCOM, from 10 July 1995 through 4 April 1996 “to provide an operational level review of SIOP targeting, in the context of guidance and policy issues likely to affect the size and composition of the National Target Base (NTB). Over 18,000 installations in the Target Data Inventory (TDI) were reviewed by the working group and compared with national guidance and USSTRATCOM internal target selection procedures The SIOP Target Review validated the guidance to target selection process. The working group concluded that the guidance interpretation and target selection process is difficult and dynamic, requiring judgement and experience ... However, the target data base changes rapidly as the intelligence community and target analysts continually refine and revise their analysis and the complexion of world relationships change. Therefore, the working group concluded in the final decision brief to CINCSTRAT that the validity of this review is perishable and a similar review should be repeated every few years.” Each NTB installation was reviewed to determine its validity and appropriateness for inclusion or exclusion from the SIOP. The Working Group made recommendations for changes, some of which could be done under the purview of STRATCOM, and some of which required changes to national policy as contained in the Joint Strategic Capabilities Plan (JSCP) and the Nuclear Weapons Employment Policy (NUWEP).

The Working Group identified 28 items to be fixed without higher direction. Most constituted decisions to exclude or include individual installations from the NTB (by 1 March 1997, only one item, “Systems Approach to Targets” was open. The 28 items were:

- Chemical and Biological Weapon Storage/Production.
- Deep Underground Facilities.
- Space Coordination and Computer Centers (requested guidance changes in the JSCP).
- POL Pumping Stations.
- Air Depots.
- Ministry of Maritime Fleet.
- Nuclear Weapon Storage Support Areas and Rail Transfer Points.
- Ground Forces Material Repair and Storage.
- Conventional Weapons Temporary Storage Areas.
- ABM Airframe Production.
- Submarine Repair Facilities.
- Over-the-Horizon Radars.
- Conventional Fighter Air Bases.
- VIP Subway Nodes.
- NCA Facility at Ramenki.
- Naval Missile Test Sites.
- National Electrical Power Command and Control.
- Aircraft Airframe Production.
- Electrical Power Converters (“this facility has been redesignated. Revise target selection criteria to delete from NTB”).
- Nonferrous Metal Production (“DIA has confirmed this facility has been shutdown and abandoned for several years. Revise target selection criteria to delete from NTB”).
- Tactical Aviation Command Posts (“Revise target selection criteria to delete the three

facilities located in central Russia (near the Mongolian border) from the NTB, but retain all other tactical aviation command posts.”)

- Radio Communications Facilities.
- Moscow Area Secure Reserve Force (SRF) Planning (requested guidance changes to the JSCP).
- Secure Reserve Force (SRF) DGZ Construction (requested guidance changes to the JSCP).
- Systems Approach to Targeting.
- Layering of Critical Targets.
- Inline Weapons Efficiency.

The Working Group identified additional items that required changes in national guidance in order to change. These included:

- Nuclear Republics Targeting Strategy (continued targeting of certain facilities outside Russia).
- ICBM Launch Control Facilities.
- Moscow Area Targeting.
- MAO-1/MAO-2 Attack Structure.
- Secure Reserve Force (SRF) DGZ construction.
- Nuclear Weapon Storage Support Areas & Rail Transfer Points.
- Reconstitution Airfields Selection Criteria.
- ABM Warhead Storage and Airframe Production.
- Akula SSN/SS-N-21 Strategic Asset.
- Main Operating Bases vs. Deployment Bases.
- Off-Base Air-Launched Missile Support.
- Civil Defense Command Bunkers.
- Biological Weapons Research and Development (R&D) Facilities.
- NCA Facility at Ramenki.

(STRATCOM, “SIOP Target Review,” 1 November 1996, partially declassified and released under the FOIA).

SIOP Targeting Review. Review of nuclear targeting commissioned by Secretary of Defense Cheney in 1989 and lasting 18 months. The Review specifically looked at layering and redundancy in targeting that had crept into the plan over the years, resulting in some 12,500 targets in the National Target Base (NTB). The end result of the Review was a new post-Cold War NUWEP, which significantly decreased the number of targets associated with SIOP options.

SLBM Integrated Planning System (SIPS). Integrated submarine-launched ballistic missile (SLBM) planning system. The tool developed by the Naval Surface Warfare Center Dahlgren Division.

SODIUM. PC-based DGZ tool.

Sortie Generation Time/Bomber Priority (SGTIM). System that supports development of SIOP mission planning data. Updates sortie generation times and bomber priorities from a flat file to Strategic War Planning Systems Enterprise Database (SWPS-EDB).

Spatial Data Server (SDS). Common user client application which provides access to NIMA produced products such as Digital Terrain Elevation Data (DTED), Digital Chart of the World (DCW), Compressed Arc Digitized Raster Graphics (ADRG/CADRG), and World Vector Shoreline (WCS).

SSP Production Plan. The annual intelligence support requirements statement which documents, in priority order, all known SIOP-related support requirements. The plan provides a prioritized listing of intelligence support activities that can be supported by available resources and a listing of requirements that cannot be implemented in the SIOP Production Plan due to resource shortfalls.

Stable Nucleus. In the context of development of a “Living SIOP,” “a core set of targets and special attacks that do not change substantially over time, thereby eliminating the need, and the time involved, in making major changes.” The Stable Nuclear was defined by 30 June 1994. (STRATCOM, Strategic Planning Study, Final Report, pp. 5-12, 5-13)

Standard Coding System Functional Classification Handbook. DIA handbook that contains guidance and procedures on the use of functional category codes, which classify installations by function through the use of standard intelligence codes that indicate the products, capability, or activity associated with the installation. The classification system consists of a five-digit numeric character code. The handbook is published as required and is intended for use with the BE, Geographic Installation Intelligence Production Specifications (GIIPS), and related targeting documents.

Status, Control, Alerting, and Reporting System II (SCARS II). System that prepares, transfers, receives, and disseminates NATO Command and Control Emergency Action Messages (EAMs) to communicate accurate and timely data for decision-making at Supreme Headquarters Allied Powers Europe (SHAPE). Provides a direct interface during coordinated execution of the Supreme Allied Commander Europe (SACEUR) Nuclear Operational Plan and the U.S. SIOP against targets in the Allied Command Europe area of interest.

STRATCOM Intelligence Network (SINET). SCI-level network supporting the Modernized Integrated Database (MIDB), and EISI.

Strategic Advisory Group (SAG). STRATCOM advisory panel established in 1968 under SAC to provide technical and scientific advance to the Director of Strategic Target Planning. Under STRATCOM the charter was expanded to include advice on policy related matters. SAG meetings occur biannually.

Strategic Air Command Methodology for Analyzing Reliability and Maintainability Goals and Investments (MARGI-SIOP). Analysis model, introduced in 1986, used to address the contribution of reliability and maintainability to the warfighting capability of strategic bombers. The output is a tabulation of damage expectancy degrade due to each aircraft subsystem (e.g., reliability, repair time, spares). The code is unclassified.

Strategic Aircraft Reconstitution Team (SART). Deployable team that would meet bombers and

tankers at post-strike bases.

Strategic C⁴I Assessment Tool (STRATCAT). A system designed to provide a tool to access and manipulate relevant C³ database information collected from various sources and furnish quick answers to operational problems. STRATCAT is used primarily in day-to-day operations and is designed to help the users to respond rapidly to changing threat situations, maximize information flow to general officers, and support collaborate planning.

STRATCAT was designed by the Defense Special Weapons Agency to support STRATCOM requirements for a C³ assessment tool for its component elements, i.e., the Support Battle Staff (SBS), J-6 Directorate, Exercise Support Staff, the Mobile Consolidated Command Center (MCCC), and the Airborne Command Post. The initial model was designated STRATCAT 1.0. STRATCAT 3.0 was scheduled to reach initial operational capability (IOC) in FY 1998 with full operational capability in FY 1999. This version incorporates improvements to satellite data and electromagnetic [ulse (EMP) effects. (DSWA, "Statement of Work for Strategic C4 Assessment Tool (STRATCAT) Follow-On Development," July 1998). Vendors include Microhelp, Inc. and New World Software.

Strategic C⁴I Outage Reporting & Evaluation System (SCORES). STRATCOM system being developed which will automatically receive and process C⁴ system status messages from U.S. combat units of interest, store the data contained in them, and manipulate the data for display and analysis. SCORES is part of the software architecture for the Global Command and Control System (GCCS). The vendors include Microsoft, RIX Softworks, AllMicro, Inc, EPS Technologies, ESRI, Oracle, TerraView, Strategic Mapping, Inc., Western Digital, and PowerSoft.

Strategic Command (STRATCOM). The unified command established in 1991 charged with centralized control of Navy and Air Force strategic nuclear forces. STRATCOM is the primary agency for analyzing, planning, maintaining, and executing the SIOP war plan and its various options. According to the JCS Unified Command Plan (11 October 1991, pp. 21-22):

(U) "USCINSTRAT has no geographic area of responsibility for normal operations and will not exercise those function of command associated with area responsibility.... USCINSTRAT will have primary responsibility for strategic nuclear force to support the national objective of strategic deterrence. In addition, USCINSTRAT's responsibilities include:

- (1) (U) Employing assigned forces, as directed.
- (2) (U) Providing support to other combatant commanders, as directed.
- (3) (U) Conducting appropriate worldwide strategic reconnaissance.
- (4) (U) Ensuring command, control, communications, and intelligence (C³I) for strategic force employment."

STRATCOM is also tasked by the Nuclear Supplement of the Joint Strategic Capabilities Plan (JSCP) to provide specific support to geographic combatant commanders for their nuclear planning. (JCS, *Doctrine for Joint Theater Nuclear Operations*, Joint Pub 3-12.1, p. III-1.)

Strategic Command & Control Architecture Model (STRATC²AM). Air Force Center for Studies and Analysis research and evaluation tool which deals with force capability and

requirements. STRATC²AM analyzes command, control, and communications networks in ambient and stress environments. The model is updated by SAIC. Vendors include Apex, New Technology Solutions, Desaware, McAfee, Visio Corp., Microsoft, Avanti Software, Sheridan Software, Apex, and Whipple Wave.

Strategic Engagement Analysis Tool (SEAT). Los Alamos Laboratory developed model, introduced in 1987, used to perform analysis of SS-24 ICBM relocatable target acquisition, attack, and defense. The model covers various areas of the former Soviet Union and includes rail and road networks.

Strategic Force Accounting Module (SFAM). A system that supports the Joint Chiefs of Staff and STRATCOM with state-of-the-art strategic force status reporting. Strategic force status reports are generated to reflect the current status of nuclear forces and their ability to conduct operations on a global basis. SFAM is a relational database management system. SFAM processes and displays SIOP force status data, SIOP support data, non-SIOP mission data, and logistical data. It also supports Nuclear Execution Reporting Plan (NEREP) report generation to build FORGEN (force generation) and LAUNCH reports. The vendor include Microsoft, MicroGrafx, Xtree Company, Sheridan Software, Center View, Crystal Sciences, EPS Technologies, ESRI, Oracle, TerraView, Strategic Mapping, Inc., Western Digital, and PowerSoft.

strategic interest locations (Bravo Charts).

Strategic Liaison Assistance Team (STRATLAT). STRATCOM liaison team located at unified commands and Joint Task Force headquarters for the purpose of assisting in nuclear and conventional targeting and planning.

Strategic List of Enemy Activations/Deactivations (STRATLEAD). Intelligence target notification.

Strategic Offense/Defense Simulation (SODSIM). Model, introduced in 1985, that simulates the end-to-end interaction of force exchanges involving Red and Blue strategic offensive and defensive forces. It is used to explore national strategy and policy issues, assess variations in targeting doctrine, evaluate alternative strategic defense architecture, examine battle management and C³ concepts, and evaluate the deployment of theater ballistic missile defenses.. SODSIM handles multi-wave strategic nuclear attacks and uses CEP values to distribute Actual Ground Zero (AGZ) locations of arriving weapons. The accuracy of damage predictions depends on the accuracy of this distribution. SODSIM is being incorporated into the Strategic Warfare Planning System Enterprise Database (SWPS-EDB). Effective with SIOP-97 (October 1996), STRATCOM began using SODSIM instead of the Event Sequence Processor (ESP) to predict a range of possible results for each planned SIOP execution option. SODSIM predicts two essential events for each SIOP weapon: arrival and detonation in the target area; and damage to installations near the detonation. The SIOP 98 war game analysis completed in September 1997 identified a number of improvements that should be made to SODSIM.

The model was developed by and is managed by Blime & Associates, Inc. The code is unclassified. A supplement to SODSIM is called the Strategic Offense/Defense Simulation

(SODSIM) to SAS Intermediate Generator (SSINTGEN). (STRATCOM/J531, "USSTRATCOM War Game Analysis Report For SIOP 98 (U)," 5 September 1997, p. 5-1, partially declassified and released under the FOIA).

Strategic Operations Planning Systems (SOPS). STRATCOM interface program into JOPES.

Strategic Penetrator Model (STRAPEM). Aircraft and cruise missile penetration simulation model developed by the Air Force Studies and Analysis Agency and introduced in 1989.

Strategic Planning Study. STRATCOM study initiated in January 1993 to evaluate and make recommendations regarding modernization of the Strategic Warfare Planning System. The Study was a zero-based review of SIOP preparation and the SWPS, including systems, application tools, infrastructure and databases. It recommended a three phase modernization to develop the Enterprise Database (EDB) and transition from a variety of mainframe applications to a single client-server environment. See Strategic Warfare Planning System.

Strategic Recovery Plan (SRP). Post-SIOP contingency plan laying out functions associated with management of recovering strategic forces and monitoring of the effects of nuclear detonations, probable damage levels, potential fallout patterns, radiation exposure, and casualty estimation.

Strategic Relocatable Target (SRT). A mobile target such as a mobile missile, dispersed bomber, or mobile command and control asset. The JSCP Nuclear Supplement defines SRTs as "a mobile or movable strategic nuclear weapon or function that does not have a static wartime location. Strategic relocatable targets may move while performing their intended function, as doctrine and conditions dictate." (CJCS/J-5, "Nuclear Supplement to Joint Strategic Capabilities Plan for FY 1996 (JSCP FY 96)," CJCSI 3110.04, 12 February 1996, p. H-19, partially declassified and released under the FOIA). See also relocatable target.

Strategic Reserve Force (SRF). See Secure Reserve Force, Nuclear Reserve Force.

Strategic Target Program. Element of the Missile Target Materials Program.

Strategic Warfare Planning Systems (SWPS). STRATCOM automated planning system-of systems. The system originated during the 1960s at the height of the Cold War to deal with the threat to the United States from the Soviet Union. It originally supported the Strategic Air Command (SAC) and the Joint Strategic Target Planning Staff (JSTPS). Although the SWPS is referred to as a planning system, it also supports considerable analysis activities which are integral to the planning process. (STRATCOM, "Operational Requirements Document (ORD) for United States Strategic Command (USSTRATCOM) Strategic War Planning System (SWPS)," December 1994, p. 7, partially declassified and released under the FOIA).

The current SWPS modernization effort is designed to transition nuclear war planning applications from a mainframe architecture to a client-server architecture. Based upon the results of the STRATCOM Strategic Planning Study completed in 1993, a new SWPS is in the process of being created. The "funded" three-phase SWPS modernization plan includes:

- Phase I: Update the computing environment to support subsequent application/software migration.

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- Phase II: Migrate applications/software to the planning workstations and server architecture.
 - Phase III: Develop a new Enterprise Database (called the Strategic War Planning Systems Enterprise Database (SWPS-EDB) or sometimes just the Enterprise Database (EDB), transition SIOP planning applications to SWPS-EDB and implement Client-Server environment.

The Enterprise Database will provide the data repository for the SWPS client/server environment. When SWPS modernization is completed, SIOP planning timelines will be reduced by two-thirds, adaptive planning timelines will be optimized, redundant databases and data terms will be eliminated, and standard analysis application tools will be implemented. There will be a reduction in personnel, operating, maintenance and support costs providing significant overall cost savings and avoidance.

With Phases I and II largely completed, development has been recently accelerated for full operation in 1998. SWPS-EDB is operational, but as of early 1998, was not fully stabilized for development work and reduction of SIOP 99. Because there is some risk in transitioning from the old to the new SWPS, SIOP planners are “maintaining” a SIOP under both the old SWPS and “building” a SIOP under the new SWPS simultaneously. Even at completion, some applications will not be totally compatible with the new SWPS-EDB and will continue to run alone or on the old SWPS.

As the war planning process evolves to the so-called “Living SIOP” concept, based on continuous analysis of guidance, forces, and target changes, SWPS will be able to support the near continuous war plan production. The original architecture objective was the reduction in the SIOP development and implementation time from 18 to 6 months, the development of limited options in as little as 24 hours, and the implementation of platform-compatible deliberate and crisis planning tools in both fixed and mobile planning environments. The modernized SWPS will also provide the ability to perform new or enhanced missions such as theater nuclear planning and non-strategic nuclear forces (NSNF) planning. This also includes the capability for worldwide planning to the extent that data is available to STRATCOM. In addition, the increased computational workload stemming from the incorporation of new, low observable weapon systems had to be accommodated without having an effect on the new requirements for system responsiveness.

The conceptual SWPS computing environment consists of the graphics workstations as the predominant application processing platform. The server provides access to printers and global data (data used by more than one SWPS application). External links are controlled by the global server through guard processors. The communications backbone contains four rings supporting Top Secret SIOP/Extremely Sensitive Information (ESI), Top Secret, Secret, and unclassified information.

The SIOP planning process is essentially sequential in nature, starting with target selection, followed by aimpoint construction, allocation, aircraft and missile application, penetration analysis, timing and resolution, weapon review, and production. In addition to the transit database used by the planning application to store computer results, each application generally uses static databases, as well as databases that are maintained by other applications. As the

transit/planning databases are updated by the applications, planning results are moved from application to application. For example, when the Missile Graphics Planning System (MGPS) has completed missile application, the MS component (a database of SWPS) is moved to Weapon Review where the Missile Aircraft Difference Evaluation System (MADES) is used to perform quality control.

The current nuclear planning process and systems are primarily designed to plan and analyze strategic nuclear forces. Yet along with STRATCOM's evolving mission, the modernized SWPS will be able to plan and analyze a variety of strategic weapons for any theater (global, regional) either as deliberately planned options or by adaptive planning.

SWPS includes the following applications:

- Air Force Satellite Communications System (AFSATCOM).
- Air Vehicle Force Application System (AFAS).
- Aimpoint
- Applied Weapon
- Automated Routing and Maintenance System (ARMS).
- Automated SIOP Allocation (ASA).
- Blast Damage
- Counter Measure
- CT&R (Combined Timing and Resolution).
- Data Admin
- Digital Terrain Elevation Data (DTED)/Terrain Contour Matching (TERCOM).
- Document Production
- JL Maintenance.
- MGPS/M115 (Missile Graphics Planning System).
- Missile Application
- Missile Execution Plan
- Missile Kit Activity
- National Target Base (NTB) Maintenance.
- NDL Maintenance
- NDL Integrated Development System (NIDS).
- NUWEP (Nuclear Weapons Employment Policy).
- Operations Analysis Strategic Interactive Simulator/Footprint (OASIS/FTPRT).
- Red Integrated Strategic Operations Plan (RISOP) Gaming.
- ROPES (Route Analysis and Penetration Evaluation System).
- Strike Assessment.
- System Support.
- Weapon Data Management.

The SWPS application modernization effort will reduce approximately 20 million lines of code to about 11 million. In 1993, SWPS was made up of the following databases (with size in gigabytes):

- AC (.003)
- AD (0.2)
- AF (3)
- AI (.02)
- AN (.05)

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- AP (.2)
 - AS (1)
 - AT (1)
 - AV (.004)
 - AW (.1)
 - CT (.7)
 - DT (.01)
 - DY (.2)
 - GI (.8)
 - JD (.8)
 - JL (1.5)
 - MG (.01)
 - MS (.85)
 - MW (.05)
 - SD (1)
 - TM (32)
 - TP (.005)
 - TR (1)
 - WD (.2)

Strike Assessment. Strategic Warfare Planning System application.

Submarine Adaptive Targeting Systems (SATS). Portable SLBM retargeting system.

Submarine Continuity of Operations (SCOOP). Contingency plan for the creation of temporary homeports and logistics support stations for ballistic missile submarines during generated alert and in the trans- and post-SIOP phases. SCOOP planning and exercises in the Pacific have included the creation of Trident support facilities in Alaska and Guam.

Supreme Allied Command Europe (SACEUR) Theater Aircraft Translate (STATR). The application uploads Supreme Allied Commander Europe (SACEUR) aircraft sortie data to the Strategic War Planning Systems Enterprise Database (SWPS-EDB). The data is used by other applications to deconflict SACEUR sorties with STRATCOM sorties.

Sun City. STRATCOM initiated alternative force structure study undertaken in 1993. Sun City predated the Nuclear Posture Review (NPR) and analyzed the number and combinations of forces required for START II implementation and beyond. It also focused on the amount of capability and flexibility that would be lost at different levels of funding. A Sun City Extended study in 1994 looked at Russian and Chinese scenarios that might require increases in nuclear forces and new targeting schemes.

Surface to Air Missile Check (SAMCHECK). SAMCHECK is a system that provides an interface for SAMPK to retrieve a single engagement between an aircraft and a surface-to-air missile (SAM) site.

Surface to Air Missile Routing and Maintenance System (SAMARMS). The SAMARMS model performs multiple route generations and evaluations for land- and sea-based threats (by

calling SAMPK.) SAMARMS produces anti-aircraft artillery (AAA) and surface-to-air missile (SAM) penetrator grid templates. Each template defines SAM/AAA system lethality in terms of grid/cost value. These templates are used by the Automated Routing and Maintenance Simulation (ARMS) in order to avoid SAM defenses or to “smartly” fly through them.

Survivable Adaptable Planning Experiment (SAPE). Force level planning system developed in the late 1980's with an entirely new set of algorithms (Hungarian, network flow, and Auction) to handle large nuclear operational planning changes (thousands) within hours. The SAPE contract has been terminated and the system is not being further developed.

SWPS Database Analysis System (SDAS). System slated to be eliminated.

SWPS Integrated Data Management System (IDMS). System slated to be eliminated.

SWPS Integration Testbed (SIT). Component of the development/test environments of the STRATCOM nuclear war planning system. (STRATCOM/J66, “U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. viii, partially declassified and released under FOIA).

System Performance Parameters. The number of SIOP missions planned in a given period of time.

Systems for Integrated Nuclear Battle Analysis Calculus (SINBAC). RISOP war gaming model, introduced in 1985, and formerly used by JCS/J8 in strategic nuclear analysis.

tactical target materials (TTM). Materials which provide a graphic representation of individual or multiple facilities, installations, or targets with specific identification, geographic location, and textual description of location and physical characteristics.

tactical target materials program (TTMP). Program established for the production of tactical target materials and related items in support of unified command and allied participant requirements.

Tactical Target Program. Element of the Missile Target Materials Program.

target. 1. In general, a geographical area, complex, or installation planned for capture or destruction by military forces. 2. In intelligence usage, a country, area, installation, agency, or person against which intelligence operations are directed. 3. In nuclear planning, a point or area on the earth's surface that has been assigned a unique identifier consisting of (in the case of a facility) a combination Basic Encyclopedia (BE) number, suffix, and Intelligence Data Handling System (IDHS) category code, the target name, the geographic coordinate, and a two-character geopolitical (or country) code, or (in case of an installation) a BE number, or (in the case of an area target) an Area ID. 4. Theater Analysis and Replanning Graphical Execution Toolkit (TARGET).

target analysis. An examination of potential targets to determine military importance, priority of attack, and weapons required to obtain a desired level of damage or casualties.

target array. A graphic representation of enemy forces, personnel, and facilities in a specific situation.

target category. A group of targets all of which serve the same function or can produce the same product.

target characteristics. The distinct inherent, acquired, functional, physical, environmental and mobility characteristics that form the basis for target detection, location, identification, and classification. The different characteristics include:

- Inherent Characteristics: The initial, original, designed, or essential characteristics of an object or area. Generally, these are immediately obvious features and are used to detect, identify, and categorize an object or area. Inherent target characteristics include, for example, the expansive and relatively level area that is free from surrounding vertical obstructions at airfields; barracks, tents, administration buildings, service buildings, and perimeter fences at military installations; and the spans, piers, abutments, and superstructures of bridges. Generally, these characteristics consist of those gross and usually obvious features that are used (either consciously or unconsciously) in detecting, identifying, and categorizing an object or area.

- Acquired Characteristics . Characteristics that modify, enhance, or augment the inherent characteristics of an object or area. Examples include: replacing a sod runway with a concrete runway; building a surface-to-air missile (SAM) site within the perimeter of a previously undefended troop concentration area; and widening the deck of a one-lane highway bridge to two lanes. Acquired characteristics can change a target's function without necessarily modifying its observable characteristics. For example, a fertilizer plant might be converted to an explosives production facility without changing the outside appearance of the plant.

- Functional Characteristics: The operations and activity levels of an actual or potential target. Functional characteristics include target function, status, level of activity, functional complexity, importance, reconstitution potential, and position. Functional characteristics contain the following:

- Function (target's normal or reported activity)
- Status (state or condition at a given point in time), consisting of:
 - Operational (producing or capable of action, i.e., is manned, has equipment, and is mission ready, even if damaged to some extent),
 - Occupied (has equipment, but cannot be determined if manned or operational),
 - Transitional (passing from one condition, form, stage, or place, to another),
 - Nonoperational (not producing or inactive),
 - Dormant (inoperative or inactive),
 - Damaged, or
 - Dismantled.
- Level of activity, consisting of high, normal, or low.
- Functional complexity (the number and complexity of separate activities).
- Material and psychological importance (actual or perceived value or significance).

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- Reconstitution potential (capable of recovering from damage so as to perform its functions).
 - Physical Characteristics: The visually discernible features or the target's sensor derived signatures (detected, identified, and categorized displays registered in one or more portions of the electromagnetic spectrum). The target shape, size, composition, reflectivity and radiation propagation, the type and number of weapons. Physical characteristics of the target are described using words, abbreviations, acronyms, or numbers (for example, shape, dimensions, type of construction, etc.). They include the following:
 - Size and shape,
 - Point target,
 - Area target,
 - Linear target (long and narrow),
 - Appearance (outward form and features),
 - Physical complexity,
 - Dispersion and concentration of elements,
 - Number of components,
 - Personnel,
 - Redundancy,
 - Substance (construction materials or matter used in structures in any object or area),
 - Reflectivity potential (the ability to reflect light, heat, or sound),
 - Electromagnetic radiation propagation (the emission or transmission of wave energy; gamma radiation; x-rays; visible, infrared, and ultra-violet radiation; and radar and radio transmissions),
 - Active (intentional emission propagation),
 - Passive (unintentional emission propagation),
 - Vulnerability (susceptibility to damage, destruction, or functional disruption as a result of military action),
 - Hard (low sensitivity to damage or disruption),
 - Soft (high sensitivity to damage or disruption), or
 - Reconstitution potential (capable of recovery from damage so as to perform its original functions).
 - Mobility Characteristics: A target's ability to move or be moved. A target's mobility is closely related to its functional and physical characteristics and is influenced by prevailing doctrines or strategies governing its use. Mobility characteristics include whether a target is moving or nonmoving. A nonmoving target is one that is either temporarily or permanently stationary. These can be classified further as being:
 - Fixed (e.g., an airfield),
 - Mobile (capable of moving under their own power), or
 - Transportable (capable of being transported or relocated).
 - Environmental Characteristics: Constant or manmade conditions and circumstances within which the target exists. These characteristics affect decisions concerning reconnaissance and weapon system selection and employment. They include:
 - Atmospheric characteristics, such as the current and forecasted weather conditions,
 - Temperature,

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- Weather (light, moderate, or heavy thunderstorms, rain, drizzle, hail, snow, ice, etc.),
 - Visibility (clear, obscured by smoke/fog/haze/blowing dust/blowing sand/blowing snow/blowing spray),
 - Cloud cover (percentage of ground obscured by clouds at various altitudes above the target),
 - Winds (direction and intensity at various altitudes),
 - Atmospheric pressure,
 - Light,
 - Physical relationships,
 - Target density (number of elements per unit of area; target compactness; proximity to other targets),
 - Relation to allies, friendlies, or enemy civilians (distance and direction),
 - Geographic characteristics, such as terrain, vegetation, geology, elevation, etc.
 - Cultural features (cities, roads, rail lines, power lines, etc.),
 - Economic characteristics, including the availability of raw materials, personnel, energy, water, and transportation,
 - Raw materials,
 - Personnel support (shelter, life support),
 - Energy (sources),
 - Water (potable or nonpotable),
 - Command, control, and communications,
 - Transportation support,
 - Enemy countermeasures,
 - Electronic countermeasures (ECM) and electronic counter-countermeasures (ECCM),
 - Defenses (AAA, SAMs, aircraft, etc.),
 - Concealment (caves, trees, etc.),
 - Deception efforts (dummy SAM sites, dummy aircraft, etc.), and
 - Camouflage (nets, paint, etc.).

target complex. A geographically integrated series of target concentrations.

target concentration. A grouping of geographically proximate targets.

Target Data Inventory (TDI). Basic targeting database, now officially replaced by the Integrated Database/Modernized Integrated Database (IDB/MIDB). The TDI provides standardized target data in support of the contingency planning requirements of the Joint Chiefs of Staff, military departments, and unified and specified commands for target planning, coordination and weapons application. It is the primary reference on the location, identification, relative importance, and physical vulnerability of target installations in functional categories. The TDI was previously published annually, in three basic area publications (Eurasian, Middle East, and Southeast Asian) and consisted of two volumes: a complex listing (volume 1) and a categorized listing (volume 2). In 1989, the TDI held approximately 90,000 installations. The TDI has its own handbook, *The Target Data Inventory Handbook*, which provided summaries and descriptions of data appearing in code in the TDI. After October 1993, the TDI became the Integrated Database (IDB). (USAF Intelligence Targeting Handbook, 20 July 1981, p. 7-1,

partially declassified and released under the FOIA). See Modernized Integrated Database (MIDB), functional classification code.

target density. The number of elements per unit of area; target compactness; proximity to other targets.

target development. 1. The examination of potential target systems and their components to determine change to system criticality and vulnerability to attack. It is a phase of targeting that distills guidance into lists of targets. 2. The functional area of SIOP preparation that includes selection, classification, coding and prioritization of installations into the National Target Base (NTB). Installations are selected and coded for inclusion into the NTB using rule based software called the Target Development System (TDS). It includes critical node analysis, network analysis, knee of the curve or marginal analysis (“used to identify marginal return where capacity is the critical item evaluated”), and multi-attribute decision criteria for ranking airfields. The target development process also specifically includes assessment of significance of selected installations; selection, prioritization, and coding according to SIOP and Secure Reserve Force (SRF) attack options; construction of nuclear aimpoints; coding and prioritization of DGZs; development and maintenance of the National DGZ List (NDL) and the Reserve Force Target List (RFTL). For SIOP-94, target development was accomplished in 15 weeks. The next step in the process is DGZ construction. Regional commanders-in-chief also retain responsibilities for target development to support nuclear contingency planning in their areas of responsibility. See Target Development System.

Target Development System (TDS). Rule based software used in selecting and coding targets for the National Target Base (NTB).

- TDA (Target Development System - Online).
- TDB (Target Development System - Rule Based).
- TDM (Target Development System - Online Maintenance).

target diameter. The diameter of the smallest circle that would contain the entire target.

target element. The basic unit of a target. Some targets consist of one element; for example, a single bunker. Others consist of similar multiple elements; for example, a POL tank farm.

target ellipse. Defined by the major axis, minor axis, and major axis angle around the centroid of a point target. It bounds the entire area of the target.

Target Intelligence Handbook (DDB-2600-312-YR). DIA produced standard handbook that defines specific guidance and procedures associated with the analysis, production, and processing of installation intelligence. The TIHB includes information on BE numbering and naming procedures, security classification guidance, coordinates, abbreviations, target intelligence programs, products, and geographic areas of coverage. It is published as required to facilitate the production, maintenance, and use of the Basic Encyclopedia (BE), Geographic Installation Intelligence Production Specifications (GIIPS), and related target intelligence documentation programs.

Target Intelligence Production Plan (TIPP). An annually updated, long-term DIA research and

production plan designed to identify, document, and solve critical intelligence gaps in U.S. targeting strategy.

target island. A geographical area encompassing one or more installations.

Target Island and DGZ Construction and Maintenance (DAC and TIC). Component of the software architecture in the NLD Integrated Development System (NDS) for SIOP mission planning. (STRATCOM/J66, "U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. viii, partially declassified and released under FOIA).

Target Island Boundary Manual. NATO nuclear related.

target list. A listing of targets officially maintained and promulgated by the command. It contains those targets which are to be engaged, as distinguished from a "list of targets" which may be maintained by any echelon of command as confirmed, suspect, or possible targets for informational and planning purposes.

target materials. Graphic, textual, tabular, or other presentations of target intelligence primarily designed to support operations against designated targets by one or more weapons systems. Target materials are suitable for training, planning, executing, or evaluating such operations.

Target Materials Program (TMP). 1. Program established for the production of all documents specifically supporting installation target analysis and operational planning employment. The DOD overall TMP manager is DIA. 2. The production programs responding to the JCS charter for NIMA to produce unique, critical geolocational information supporting the long-range worldwide requirements of the unified and specified commands, military departments, and allied participants. The program consists of precision point location products such as the Installation Reference Point Graphic (IRPG), Aim Point Graphic (APG), and grid photos; deployable Point Positioning Data Base (PPDB) in either film, video, or digital form; cartographic Air Target Materials like the Air Target Chart and Jog-Radar; and a variety of other special materials and services.

Target Planning System (TPS). Application that supports Installation Transaction Files (ITFs) from the Intelligence community and creates the set of SIOP targets according to rules provided by the Joint Chiefs of Staff. It provides data mover software to transfer TPS data to the Strategic War Planning Systems Enterprise Database (SWPS-EDB). Target Planning System (TPS) Rehost provides a transitional rehost of production and maintenance functionality of the National Target Base (NTB) from the TRIAD Computer System (TRICOMS) mainframe to workstations. Target selection and coding information is compiled on the National Target Base Server (NTBS) and passed to TPS as ITFs via the EISI Guard processor for production of the NTB. The follow-on to TPS is the reengineering of TPS functionality and processing into NIDS-II (FY 1998). Vendors include Microsoft, GLBS, Blue Sky Software, Silicon Graphics, Compuware, and IBM.

target polygon.

target prioritization. “Targets are normally prioritized based upon the overall targeting strategy. Further refinements of target priorities will be made within each target category (e.g., industrial, military, energy facilities, storage facilities, weapon storage areas) based on the operational situation and the objectives established by the appropriate command authority.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, p. II-5.)

target selection criteria. General or specific criteria used in the selection of target systems or specific targets. The criteria include concepts such as importance, cushion, depth, reserves, recuperation, vulnerability, dispersion, location, identification, and perishability.

target set. Target category, or more specifically, a group of targets of the same type or related to the same operational objective.

target system. 1. All the targets situated in a particular geographic area and functionally related. 2. A group of targets which are so related that their destruction will produce some particular effect desired by the attacker.

Almost all SIOP targeting is now based on targeting systems. A target is composed of components, and components are composed of elements. A single target may be significant because of its own characteristics, but often its importance lies in its relationship to other targets. The effect of an attack thus can be determined only by analyzing the target in the overall target system. Targeters increasingly focus on functionality. “Functionally related” means that targets in a system have the same activity, or that each makes one or more parts of a particular product or type of product.

target system analysis. 1. A systematic approach to determine vulnerabilities and exploitable weaknesses. It determines what effects will likely be achieved against target systems and their associated activities. The functions and interactions between components and elements of a target system are reviewed. The analysis provides the understanding for determining what effects are likely to be achieved by attacking the system, where the system must be attacked, and how long the attack will disrupt operations. 2. In SIOP planning, analysis studies jointly performed with the intelligence community to determine critical node, network, capacity, and area limitations.

target system components. “A set of targets belonging to one or more groups of industries and basic utilities required to produce component parts of an end product.” (Joint Pub 1-02) This definition covers the basic concept of the relationship between a target system and its component parts. A target system is divided into components, each of which may be a target. A system component is an entity supporting a functional process to produce an end product or service. For example, an air defense system may include command and control, early warning and target acquisition radars, anti-aircraft artillery (AAA) and surface-to-air missile (SAM) batteries, SAM support facilities, and other components that are neither industries nor utilities.

target type. A group defined by broad mission assigned or target system that characterizes a target for classification.

target value categories. When appropriate, targets with a homogeneous population (e.g., ground

troop installations) are categorized according to their relative value to the targeting objective. The categories normally used are: key targets, major targets, and regular (other) targets.

Target Value System (TVS). 1. A SIOP target development system used to determine the relative importance of enemy installations in accordance with national guidance. 2. A manual used in SIOP preparation that describes the target value system used by STRATCOM/J5 to determine the relative importance of installations.

targeting. 1. An analytical, systematic approach that focuses efforts on supporting operational planning and facilitates force employment. Generally, there are thought to be six phases of the general targeting process. They are:

- Guidance: Objectives and guidance derivation,
- Target development,
- Weaponing,
- Force application,
- Execution planning, and
- Battle Damage or Combat assessment.

2. The process through which objectives are selected for attack and desired effects are determined based upon a stated mission, force posture and capabilities, doctrine, plans, concepts of operations, and target intelligence.

“Targeting considerations include preplanning and target planning of nuclear strikes; countervalue and counterforce targeting; prioritization of targets; layering, which involves employing more than one weapon against a target to increase probability of destruction; cross targeting; preplanned options of maintaining centralized control while minimizing the impact of response time; emergent targets and adaptive planning; limiting collateral damage; and damage criteria.” (JCS, *Doctrine for Joint Nuclear Operations*, Joint Pub 3-12, pp. vi-vii.) See also target prioritization.

targeting regrets.

TERCOM. 1. Terrain Contour Map(ing). 2. Terrain Contour Matching. 3. SIOP mission planning data support system. Loads terrain contour matching maps from NIMA tapes to the Strategic War Planning Systems Enterprise Database (SWPS-EDB).

TERCOM Placement & Evaluation Program (TPEP). Tomahawk missile planning tool.

Theater Analysis and Replanning Graphical Execution Toolkit (TARGET). Application used in Deliberate/Crisis Action Planning for planning limited nuclear options. (STRATCOM/J66, “U.S. Strategic Command (USSTRATCOM) Master Systems Architecture (MSA), Version 98.1.0, 15 August 1998, p. iv, partially declassified and released under FOIA).

Theater Nuclear Options (TNOs). Non-SIOP option for the use of strategic and non-strategic nuclear forces in support of regional unified command needs. STRATCOM is responsible for support to the regional unified commands for TNO/Non-SIOP DGZ construction.

Theater Planning Support Document Builder (TPSDD). STRATCOM system.

Time on Target (TOT). The time at which a nuclear detonation is planned at a specified desired ground zero.

timing and deconfliction. 1. “Large-scale nuclear employment is closely coordinated within the SIOP to combine targeting, mutual support, and defense, as well as national strategies and objectives. The options contained therein provide sufficient detail to ensure mutual support and defense suppression. Of particular concern is the timing and deconfliction of weapons. Fratricide, or the destruction of one weapon by another, will reduce the effectiveness of the nuclear strike. The SIOP coordinates between different weapons to ensure they do not conflict. Air Force planners in a theater of operations must also ensure that weapons are deconflicted before being employed.” (“Nuclear Operations,” Air Force Doctrine Document 2-1.5, 15 December 1997 (Draft)). 2. A traditional functional stage of SIOP preparation that followed weapon application. Timing and deconfliction takes all untimed missile and aircraft applications and times and deconflicts all the sorties to produce a fully timed and deconflicted plan. The purpose of timing and deconfliction is to schedule all the sorties to minimize the amount of fratricide while, simultaneously, minimizing the launch window for ICBMs and the total attack duration. For SIOP-94, timing and deconfliction took four weeks. Timing and deconfliction is now a part of the assignment function.

TM. Radar terrain masking file database, a component of the Strategic Warfare Planning System.

Topographical Data Management System (R101T). System slated to be eliminated.

trans-SIOP. The time period during actual execution of the SIOP but before the post-SIOP period.

TP. Temperatures database, a component of the Strategic Warfare Planning System .

TR. Terrain mapping file database, a component of the Strategic Warfare Planning System .

Trajectory Analysis Program (TRAP). Air Force model, introduced in 1988, which simulates three vehicles, a launch aircraft, a missile, and a target. TRAP features point-mass modeling capability for one through three vehicle flyouts or intercepts, a complete six-degree-of-freedom modeling capability for the missile and its subsystems, a missile performance reconstruction evaluator and an error analysis package for statistical evaluation. The source code is unclassified.

Transient Radiation Effects on Electronics (TREE). The environment created around electronics packages (radio, radar, computers, etc.) by initial nuclear radiation. Most electronics, especially solid state electronics, are much more sensitive to radiation than other equipment and components such as hydraulic systems, fuel systems, etc. The response of electronics to radiation from a nuclear blast depends not only on the radiation present but on the operating state of the electronics at the time of exposure and on the electronics in the system.

TRIAD Computer System (TRICOMS). War planning mainframe computer system used to

construct and maintain the National Target Base (NTB). The system is being replaced by the Strategic Warfare Planning System Enterprise Database (SWPS-EDB). TRICOMS Operations Software (S042), TRICOMS Reports Archival (S045), TRICOMS Systems Integrity Management (S041), and TRICOMS Systems Software (S046) are also all slated for elimination. TRIAD was created as part of strategic planning modernization in the early 1980s. Reviews of the planning system conducted in 1992 identified millions of undocumented lines of code in the TRICOMS system with significant amounts of unused data which programmers were reluctant to overwrite. The process was extremely complicated, time consuming under unresponsive to change. (STRATCOM/J502, "Minutes of the Forty-Ninth United States Strategic Command Strategic Advisory Group Meeting (U), 1-2 April 1993, Offutt AFB, Nebraska," 23 April 1993, p. 12, partially declassified and released under the FOIA).

TRIAD Computer System (TRICOMS) parametric data base (PDB).

Triple Interpolation Curve Fit.

UK Liaison Office (UKLO) (SACEUR). British-maintained database that feed target information into the National Desired Ground Zero (DGZ) List (NDL) Integrated Development System (NIDS).

URAP. Application that is part of the Allocated Windows Planning System (AWPS).

Urban polygon. See Census Bureau/Urban Polygons (CBURP).

urgent target change (UTC). SIOP target change mechanism. Forms part of the Nuclear Planning and Execution System (NPES).

VNTK. Target vulnerability indicator designating degree of hardness; susceptibility of blast; and K-factor. See Probability of Damage Look Up (PDLookUp), Vulnerability Number.

Vulnerability Number (VN). Numbers used to express the susceptibility of a target to damage. The vulnerability number has three parts (e.g., 15Q6 or 12P3). The first number tells relative hardness of the target in relation to a 20-kiloton weapon; the letter tells whether the target is primarily sensitive to overpressure, dynamic pressure, or cratering; and the last number refers to the "K" factor, which indicates the target ductility and response related to a 20-kiloton blast wave duration and the capability for vulnerability adjustment for blast wave durations associated with weapon yields other than 20 kilotons. The K factor adjustment is required because the overpressure required to damage a target changes as a function of yield.

The letter designates the dominant damage effect and the sigma value to be used (in this case, sigma is a measure of the rate of fall-off for probability of damage with distance from ground zero). An overpressure sensitive target is designated by the letters L, M, N, O, or P, which represents sigma values of .10, .30, .40, .50, or .20 respectively. A dynamic pressure-sensitive target is designated by the letters Q, R, S, T, or U, which represent sigma values of .30, .10, .20, .40, and .50 respectively. The letter Z indicates a target vulnerable to cratering, the rupture zone surrounding a crater, crater ejecta, or direct induced ground shock or ground motion. A sigma value of .30 is used with the letter Z. (USAF Intelligence Targeting Handbook, 20 July 1981, p.

3-9, partially declassified and released under the FOIA). See also K factor, Probability of Damage Look Up (PDLookUp).

War Planning Database Management (A101K). System slated for elimination.

War Planning System Support (A101J). System slated for elimination.

wargaming. SIOP analysis function undertaken after the plan has been developed to evaluate the effectiveness of the war plan. This analysis provides a dynamic computer simulation of the SIOP against a hypothetical Red Integrated Strategic Offensive Plan (RISOP) using a Monte Carlo computer model. The results of wargaming are presented to the JCS in an annual report and briefing.

Warrior (Weapon Application Restrike, Retarget and Installation Objective Review). Graphics based SIOP maintenance and rapid retargeting program, the primary software tool of weapons review. To be integrated as a module of Strategic Warfare Planning System .

Wavefront. Survivable Adaptable Planning Experiment (SAPE) algorithm developed to rapidly (within hours) plan a large number of penetrating aircraft missions.

WD. World Data Bank file database, a component of the Strategic Warfare Planning System .

weapon allocation. A traditional functional stage of SIOP preparation following DGZ construction where weapons (ICBMs, SLBMs, aircraft and cruise missiles) are assigned to specific aim points. For SIOP-94, weapon allocation was accomplished in 11 weeks. Allocation is now a part of the assignment function.

weapon application. A traditional functional stage of SIOP preparation following weapon allocation where a specific warhead on a specific delivery system is assigned to the DGZ to create a "sortie." For SIOP-94, missile application took 16 weeks, and aircraft application, which took place in parallel, took 17 weeks. Application is now a part of the assignment function.

Weapon Assignment Model (WAM). STRATCOM theater nuclear support system, under development, which will include target selection, DGZ construction, attack strategy generation, ballistic missile footprint evaluation and storage, bomber and cruise missile route evaluation and storage, optimal attack strategy selection with corresponding footprints and routes, analysis, report generation, and data administration utilities. The WAM will be operational after the year 2000.

Weapon Data Management. Strategic Warfare Planning System application.

weapon reliability. The dependability of the warhead functioning properly.

Weapon Strike Allocation (N206A). System slated for elimination.

weapon system effectiveness. The statistical estimate of the expected results of a specific

munitions employment considering weapon effectiveness and the probability of weapon system arrival.

weaponeering. The process of quantifying the expected results of lethal and non-lethal weapons employment against prioritized targets.

Weapons Delivery Analysis System (A102B). System slated for elimination.

WINDS. Climatological database maintained by the Air Force Weather Agency and the Air Force Combat Climatology Center for SIOP planning and other contingencies. The Winds application loads Climatological and Forecast Winds data from a compact optical disc to the Strategic War Planning Systems Enterprise Database (SWPS-EDB). The application allows the user to view Winds data that has been loaded to the SWPS-EDB. The Winds data is used by planners to estimate radio active fallout patterns for nuclear detonation at different altitudes, and its impact on civilian population centers. For the FAS/CIVIC application, Winds data is received via an Internet link.

withhold. (Nuclear) “The limiting of authority to employ nuclear weapons by denying their use with specified geographical areas or certain countries.” (Joint Pub 1-02)

World Data Bank (WDB). CIA-maintained database that feed information into the National Desired Ground Zero (DGZ) List (NDL) Integrated Development System (NIDS). To be replaced by World Data Bank-II.

World Vector Shoreline (WVS). NIMA-maintained database that feed information into the National Desired Ground Zero (DGZ) List (NDL) Integrated Development System (NIDS).

zero point. The location of the center of a burst of a nuclear weapon at the instant of detonation. The zero point may be in the air, on or beneath the surface of the earth or water, dependent upon the type of burst, and it is thus distinguished from ground zero.

Zone I (Nuclear). A circular area, determined by using minimum safe distance as the radius and the desired ground zero as the center from which all armed forces are evacuated. If evacuation is not possible or if a commander elects a higher degree of risk, maximum protective measures will be required.

Zone II (Nuclear). A circular area (less Zone I) determined by using minimum safe distance as the radius and the desired ground zero as the center, in which all personnel require maximum protection. Maximum protection denotes that armed forces personnel are in “buttoned up” tanks or crouched in foxholes with improvised shielding.

Zone III (Nuclear). A circular area (less Zones I and II) determined by using minimum safe distance as the radius and desired ground zero as the center in which all personnel require minimum protection. Minimum protection denotes that armed forces personnel are prone on open ground with all skin areas covered and with an overall thermal protection at least equal to that provided by two layers.

END

Abbreviations and Acronyms

AA	attack assessment
AAFIF	Automated Air Facility(ies) Intelligence File
ABDKR	A card B card D card K card R card
ABM	antiballistic missile
ABNCP	airborne command post
ACAAM	Air Courses of Action Assessment Model
ACE	Advanced Campaign Effectiveness Model Allied Command Europe
ACES	Air Force Command Exercise System Adaptive Combat Environment System/Phoenix
ACM	Advanced Cruise Missile
ADDS	Air Vehicle Force Application System (AFAS) additions. Also known as AFAS Additions (AFASADDS).
ADRI	Arc Digital Raster Imagery
ADRG	Arc Digitized Raster Graphic
AEM	Arsenal Exchange Model
AEPDS	Automated Emergency Action Message Processing and Dissemination System
AFAS	Air Vehicle Force Application System
AFG	Air Facilities Graphic
AHQ	Ad Hoc Query
AIF	Automated Installation Intelligence File
AL	allocation
ALARM	Advanced Low Altitude Radar Model
ALC	Alternate Launch Control
ALCM	air-launched cruise missile
AMM	Advanced Missile Model
AMPS	Aim Point System ALCM Mission Planning System
AMPS-MF	Aim Point System-Main Frame
AND	Allied Command Europe (ACE) desired ground zero (DGZ) number
ANPP	ACE Nuclear Planning Process
APO	Adaptive Planning Option
APPC	Alternate Processing and Correlation Center
APPS	Analytical Photogrammetric Positioning System
APS	Aircraft (or air vehicle) planning system (APS). Also known as Air Vehicle Force Application System (AFAS).
ARCNET	Arms Control Network
ARMS	Automated Routing and Maintenance System
ASA	Automated SIOP Allocation
ASF	ACE Strike File
ASRP	Airborne SIOP Reconnaissance Plan
ATC	Air Target Chart
ATM	Air Target Materials
ATMP	Air Target Materials Program

ATT	Automated Target Tie-up
ATTG	Automated Tactical Target Graphic
AWOP	Automated Weaponering Optimization Program
AWPS	Allocated Windows Planning System
BAO	Basic Attack Option
BAS	Broad Area Search
BCR	Baseline Change Request
BDA	bomb damage assessment battle damage assessment
BE	Basic Encyclopedia
BEI	Bridge Effectiveness Index
BMPP	Ballistic missile pre-processing
BRT	bomber recovery team
BTG	basic target graphic
C ²	Command and Control
C ² -EDB	Command and Control Enterprise Database
C ² SR	Command, Control, Surveillance & Reconnaissance
C ³	Command, Control and Communications
C ⁴ I	Command, Control, Communications, Computers and Intelligence
C ⁴ ISR	C ⁴ I Surveillance & Reconnaissance
CADOB	Consolidated Aerospace Defense Order of Battle
CAMS	COMIREX Automated Management System
CAN	Crisis Action Notice
CAPS	Counterproliferation Analysis Planning System
CARDA	CONUS Airborne Reconnaissance for Damage Assessment
CATIS	Computer Aided Tactical Information System
CBIC	Common User Baseline for the Intelligence Community
CBL	Crystal Ball
CBURP	Census Bureau/Urban Polygons
CCADP	Command Center Automated Data Processing.
CCG	Crisis Coordination Group
CCOTF	Command Center of the Future
CCP	Contingency Collection Plan
CCPDS-R	Command Center Processing and Display System Replacement
CCSS	Command Center Support System
CDB	Command Data Buffer
CDE	combined damage expectancy
CEP	circular error probable
CESAR	Computing Environment STRATCOM Architecture
CINC	Commander-in-chief
CINCSTRAT	CINC, United States Strategic Command
CIVIC	Civilian Vulnerability Indicator Code
CJCS	Chairman of the Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CLSF	Composite Launch Sequence File
CMAH	CINC Mobile Alternate Headquarters
CMARP	Combined Mating and Ranging Planning System

CMPP	Cruise missile pre-processing
CMSA	Cruise missile support activity
C-MIDB	Collateral Modernized Integrated Database
CMMPs	Common Missile Mission Analysis System
CMT	critical mobile target
CMTK	Common Mapping Tool Kit
CMTS	Compliance Monitoring & Tracking System
CNA	Critical Node Analysis
	critical nodal analysis
CNI	communication of NATO intent
C of E	Consequences of Execution
COER	contingency operational ELINT requirement
COMINT	communications intelligence
COMPASS	Computerized Movement Planning & Status System
COMPES	Contingency Operations/Mobility Planning Executions System
CONPLAN	operation plan in concept format
CONUS	Continental United States
COSAND	Consolidated SIOP Analysis Document
CPFL	Contingency Planning Facilities List
CT&R	Combined Timing and Resolution
CTF	Command Task Force
DADS	Distributed Aids for Decision Support
DAFIF	Digitized Air Facility Intelligence File
DAWS	Defense Automated Warning System
DAWS/DMFE	Defense Automated Warning System/DAWS Message Front End
DC	crater diameter
DCA	dual-capable aircraft
DCAAPS	Dual-Capable Aircraft Aimpoint Selection
DCW	Digital Chart of the World
DE	damage expectancy
DEFCON	defense readiness condition
DEP	Deflection Error Probable
DFAD	Digital Feature Analysis Data
DGZ	Desired Ground Zero
	Designated Ground Zero
DIA	Defense Intelligence Agency
DIADS	Digital Integrated Air Defense System
DIRECT	Defense IEMATS Replacement Command and Control Terminal
DISA	Defense Information Systems Agency
DITDS	Defense Intelligence Threat Data System
DMPI	Desired Mean Point of Impact
DMS	Data Management System
DNA	Defense Nuclear Agency
DPC	Defense Planning Committee
DPF	Directed Planning Force
DPI	Desired Point of Impact
DPO	Directed Planning Option

DPPDB	Digital Point Positioning Data Base
DPS	Distributed Production System
	Document Production System
DR	delayed response
DRF	Designated Reserve Force
DSA	Directed Search Area
DSWA	Defense Special Weapons Agency
DTED/TERCOM	Digital Terrain Elevation Data/Terrain Contour Matching
DTD	day-to-day
DTUC	Data Transfer Unit Cartridge.
DUG	deep underground
EA	economic analysis
EADSIM	Extended Air Defense Simulation
EAM	Emergency Action Message
EAMGEN	EAM Generator
EAMNET	EAM Network
EAP	Emergency Action Procedures
EAPSS	ELINT Analysis & Processing Subsystem
EAXSS	Electronic Intelligence Analysis Process Subsystem (Contingency)
EDB	Enterprise Database
EEl	essential elements of information
EEP/EPP	Execution Plan Program
EISI Guard	Electronic Interface SWPS and IDHS
ELINT	electronic intelligence
EMARP	Employment Mating and Ranging Program
EMD	Effective Miss Distance
EMP	electromagnetic pulse
EMS	Exploitation Management Subsystem
EOB	electronic order of battle
EOBS	Electronic Order of Battle Service - Client/Server
EPAMS	Electronic Planning and Management System
EPF	Effective Protection Factor
EPW	earth penetrating warhead
ERT	execution reference time
ESAMS	Enhanced Surface to Air Missile Simulation
ESI	Extremely Sensitive Information
ESP	Event Sequence Processor
FAPES	Force Augmentation Planning and Execution System
FAS/CIVIC	Fallout Assessment System/Civilian Vulnerability Indicator Code.
FATS	fatalities
FDO	Flexible Deterrent Option
FIE	Facility Identification Element
FLAG	Forward Located Alert Generation
FLYMEM	Multiple Engagement Model Preprocessor
FMIS	Force Management Information System
FORGEN	force generation
FRAS	Fuel Resource Analysis System

Fratbuild	Fracticide Build
FROBACK	Front-end/Back-end Processors for the AEM
FSU	former Soviet Union
FTF	Flexible Targeting Force
FTL	Future Target List
FTPRNT	Footprint
FY	fiscal year
GALE-LITE	Generic Area Limitation Environment
GCCS	Global Command & Control System
GCI	ground controlled intercept
GDBSS	Ground Display/Briefing Subsystem
GENDOB	Generated Defensive Order of Battle
GEO	Geographic Database Maintenance Subsystem
GIPS	Geographic Installation Intelligence Production Specifications
GNC	Global Navigation Chart
GNT	Ground Nuclear Detection System Terminal
GOP	Global Operating Picture
GRASYS	Geographic Preprocessing Subsystem
GRIS	Global Reconnaissance Information System
GROPES	Graphical Route Analysis and Penetration Evaluation System
GRS	Global Reconnaissance Support
GSM	Global Summary Message
GSORTS	Global Status of Resources and Training System
HAB	high altitude burst
HASCAL	Hazard Assessment System & Consequence Analysis
HEMP	high altitude electromagnetic pulse
HOB	height of burst
HOCNET	HUMINT Operational Communications Network
HPAC	Hazard Prediction and Assessment Capability
HQ	headquarters
HUMINT	human intelligence
IAS	Integrated Analysis System.
ICBM	intercontinental ballistic missile
IDA	Installation Data Analysis
	Installation Damage Assessment
IDB	Integrated Database
IDEX II	Image Data Exploitation System
IDHS	Intelligence Data Handling System
IDMS	Integrated Data Management System
IEMATS	Improved Emergency Message Automated Transmission System
IESS	Imagery Exploitation Support System
IFS/5D	Demand Driven Direct Digital Dissemination
IHARDS	Improved High Altitude Radiation Detection System
IMG	Imagery Interpretation Subsystem
IMNET	Imagery Network
IMOM	Improved Many-on-Many
INCCS	Integrated Nuclear Command and Control System

IP	initial point
IPA	Image Product Archive
IPL	Integrated Priority List
IRL	SIOP Imagery Requirements List
ITF	Intelligence Target File
J-3	Operations Directorate, Joint Staff
J-5	Strategic Plans and Policy Directorate, Joint Staff
J-6	Command, Control, Communications, and Computer Systems Directorate, Joint Staff
J-8	Force Structure, Resources, and Assessment Directorate, Joint Staff
JCC	Joint Coordination Center
JCS	Joint Chiefs of Staff
JDGW	Joint Digital Geopositioning Workstation
JDTM	Joint Digital Target Material
JEAP	Joint Electronic Analysis Program
JEPES	Joint Engineer Planning and Execution System
JFAST	Joint Flow and Analysis System for Transportation
JIAT	Joint Intelligence Analysis Tool
JMEM	Joint Munitions Effectiveness Manual
JOG	Joint Operational Graphic
JOPEs	Joint Operation Planning and Execution System
JPIC	Joint Plan Interim Change
JRADS	Joint Resource Assessment Data System
JSEM	Joint Services Endgame Model
JSCP	Joint Strategic Capabilities Plan
JSOP	Joint Strategic Objectives Plan
JSTPS	Joint Strategic Target Planning Staff
JWICS	Joint Worldwide Intelligence Communications System
LAO	Limited Attack Option
LE	Linear Error
LNO	Limited Nuclear Option
LOC	lines of communication
LOGSAFE	Logistics Sustainment Analysis and Feasibility Estimator
M3DACHLR	Multi-weapon, Multi-aimpoint, Multi-criteria Development Automated Change List Handler Program
M/ATMP	Missile/Air Target Materials Program
MADC	Multiple Attribute Decision Criteria
MADES	Missile Aircraft Difference Evaluation System
MADI	Maximum Allowable Dose Index
MAE	mean area of effectiveness
MAO	Major Attack Option
MARGI-SIOP	Strategic Air Command Methodology for Analyzing Reliability and Maintainability Goals and Investments
MATRIX	Multisource Automated Target Recognition with Interactive Exchange
MATT	Multimission Advanced Tactical Terminal
MAVS	Mission Analysis & Verification System
MAXI	Modular Architecture for Exchange of Intelligence/Information

MC&G	mapping, charting and geodesy
MCCC	Mobile Consolidated Command Center
MCO	Major Contingency Option
MDITDS	Migration Defense Intelligence Threat Data System
MDPS	Mission Data Preparation System
MDS	Mission Display System Tomahawk
MEA	Mission Effectiveness Assessment
MEDEA	MEDEA Ballistic Missile Model
MEM	Multiple Engagement Module
MEPES	Medical Planning and Execution System
MGPS/M115	Missile Graphics Planning System
MGRS	Military Grid Reference System
MIDB	Modernized Integrated Database
MIIDS	Military Intelligence Integrated Data System
MIL-AASPEM II	Man In the Loop - Advanced Air-to-Air System Performance Evaluation Model II
MIMES	Multi-spectral Imagery and Materials Exploitation System
MNC	Major NATO Commander
MNR	Major Nuclear Response
MOTP	Minuteman III Operational Targeting Program
MOTP3	Minuteman III Operational Targeting Program 3
MPI	mean point of impact
MPS	Missile Performance Software
MRC	major regional contingency
MTIMS	Military Target Intelligence Management Structure
MTMP	Missile Target Materials Program
NAC	North Atlantic Council
NAOC	National Airborne Operations Center
NAS	Network Analysis System
NAT	Network Administration Tool
NATO	North Atlantic Treaty Organization
NC ² AIS	Nuclear Command & Control Automated Information System
NC ² EDB	Nuclear Command & Control Enterprise Database
NCA	National Command Authorities
NCCP	Nuclear Command Control Procedures
NDL	National Desired Ground Zero List
NDLSS	NDL Support System
NEMESIS	Nuclear Effects Models for Estimating Sensitivities to Input Scenarios
NEREP	Nuclear Execution Reporting Plan
NH	Number of Hits
NIDS	NDL Integrated Development System
NIMA	National Imagery and Mapping Agency
NIS	Newly Independent States
NISP	Nuclear Weapons Intelligence Support Plan
NIT	Network Interdiction Tool
NMCC	National Military Command Center
NNICP	National Nuclear Intelligence Collection Plan

NOG	Nuclear Operations Group
NPES	Nuclear Planning and Execution System
NPS	Nuclear Planning System
NRF	Nuclear Reserve Force
NRL	NUWEP Reconnaissance List
NSA	National Security Agency
NSC	National Security Council
NSD	National Security Directive
NSDD	National Security Decision Directive
NSDM	National Security Decision Memorandum
NSNF	nonstrategic nuclear forces
NSO	non-SIOP option
NSTL	National Strategic Target List
NTB	National Target Base
NTBS	National Target Base Server
NUCS	Nuclear Utility Calculation System
NUWEP	Policy Guidance for the Employment of Nuclear Weapons
NWARS	National Wargaming System
OAP	offset aimpoint
OASIS/FTPRT	Operations Analysis Strategic Interactive Simulator/Footprint
ODD	Odds maker
OMT	other military target
OPLAN	operation plan in complete format
OPORD	operation order
OPUS	ORCA Planning and Utility System
OSD	Office of the Secretary of Defense
OSIA	On-site Inspection Agency
OTG	Operational Target Graphic
P/A	Penetration Assessment
PA	probability of arrival
PAR	population at risk
PC Effects	Penetration and Cratering Effects
PCC	SSP Coordinating Committee
PD	probability of damage
PDCALC	Probability of Damage Calculator
PDD	Presidential Decision Directive
PDWin	Probability of Damage Calculator Windows Version
PEARL	Persistent Environmental and Aircraft Response Model
PK	probability of kill
PLC	Positive Launch Control
PLS	prelaunch survivability
PMARS	Portable Missile & Aircraft Replanning System
POTP	Peacekeeper Operational Targeting Program
PREP	Extended Air Defense Simulation Preprocessors.
PRL	prompt response launch
	prompt retaliatory launch
PRSL	Precise Radar Significant Location

PSB	Post Strike Base
PTE	Point Target Ellipse
PTP	probability to penetrate
PV	Physical Vulnerability
QAG	Quick Aimpoint Generator
RADGUNS	Radar Directed Gun-System Simulation
RAID	Rapid Application Interface Development
RB	reentry body
REACT	Rapid Execution and Combat Targeting System
READI	Readiness Evaluation, Assessment and Decision-making Information System
RECA	Residual Capability Assessment
REP	Range Error Probable
RFP	Radar Fixed Point
RFTL	Reserve Force Target List
RISOP	Red Integrated Strategic Offensive Plan
RNO	Regional Nuclear Option
ROPES	Route Analysis and Penetration Evaluation System
RPM	Rapid Prototyping Module
RPS	Reconnaissance Planning System
RRF	Reconnaissance Reserve Force
RSAC	Radar Significant Analysis Code
RSPL	Radar Significant Power Line
RSTDB	Red Strategic Target Data Base
RT	relocatable target
RTAD	Relocatable Target Assessment Data
RTAPS	Relocatable Targets Adaptive Planning System
SACEUR	Supreme Allied Commander Europe
SAG	Strategic Advisory Group
SAM	Surface to Air Missile
SAMARMS	Surface to Air Missile Routing and Maintenance System
SAMCHECK	Surface to Air Missile Check
SAMPK	Surface to Air Missile Probability of Kill
SAO	Selected Attack Option
SAPE	Survivable Adaptable Planning Experiment
SART	Strategic Aircraft Reconstitution Team
SATS	Submarine Adaptive Targeting System
SCARS II	Status, Control, Alerting, and Reporting System II
SCILAN	STRATCOM Sensitive Compartmented Information Intelligence Network
SCIPUFF	Second-order Closure Integrated PUFF
SCIS	Survivable Communications Integration System
SCO	Selective Contingency Option
SCOOP	Submarine Continuity of Operations
SCORES	Strategic C ⁴ I Outage Reporting & Evaluation System
SDAS	SWPS Database Analysis System
SDI	SIOP Data Input
SDS	Spatial Data Server

SEAT	Strategic Engagement Analysis Tool
SEP	Spherical Error Probable
SFAM	Strategic Force Accounting Module
SGTIM	Sortie Generation Time/Bomber Priority
SHAPE	Supreme Headquarters Allied Powers Europe
SIDA	Single Integrated Database
SIDAC	Single Integrated Damage Analysis Capability
SIGINT	signals intelligence
SIGS	Synthetic Imagery Generation System
SIMON	The SIOP Monitoring System
SINBAC	Systems for Integrated Nuclear Battle Analysis Calculus.
SINET	STRATCOM Intelligence Network
SIOP	Single Integrated Operational Plan
SIPE/EMIFE	Strategic Intelligence Processing Element/Enhanced Mobile Intelligence Processing Element
SIPS	SLBM Integrated Planning System
SLBM	Submarine-launched ballistic missile
SMARP	SIOP Mating and Ranging Program
SMDPS	Strategic Mission Data Preparation System
SNU	Selective Nuclear Use
SODSIM	Strategic Offense/Defense Simulation
SOPS	Strategic Operations Planning Systems
SPIRITS	Spectral In-band Radiometric Imaging of Targets and Scenes
SRF	Secure Reserve Force
SRP	Strategic Recovery Plan
SRS	Submarine Replanning System
SRT	Strategic Relocatable Target
SRTA	Strategic Relocatable Target Attacks
SSA	Single Sortie Analysis SIOP Strike Analysis
SSM	SWPS Standard Migration System
SSP	SIOP Support Program
SSPD	Single Shot Probability of Damage
STAM	SIOP Tanker Analysis Model
STATR	SACEUR Theater Aircraft Translate
STEPS	Scientific and Technical ELINT Processing
STIFF	Strategic Intelligence Forecast File
STIFF-MF	Strategic Intelligence Forecast File - Main Frame
STRAPEM	Strategic Penetrator Model
STRATC ² AM	Strategic Command & Control Architecture Model
STRATCAT	Strategic C4I Assessment Tool
STRATLAT	Strategic Liaison Assistance Team
STRATLEAD	Strategic List of Enemy Activations/Deactivations
STRATPAT	Strategic Planning and Analysis Tool
SUMRAP	Submarine Rapid Accessibility Program
SWPS	Strategic Warfare Planning System.
TABS	Threat Assessment and Briefing Subsystem

TACSAM	Tactical Surface-to-Air Missile Model.
TACSAM-MF	Tactical Surface-to-Air Missile-Mainframe
TAHLAN	Threat Analysis Hardware Local Area Network
TDD	Target desired ground zero (DGZ) designator
TDI	Target Data Inventory
TDS	Target Development System
TERCOM	Terrain Contour Mapping Terrain Contour Matching
TERF	Technical ELINT Reference File
TI	target island
TIPP	Target Intelligence Production Plan
TLE	Target Location Error
TMM	Targets Map and Merge
TMP	Target Materials Program
TMWS	Target Materials Workstation
TNO	Theater Nuclear Option
TNPD	Theater Nuclear Planning Document
TOMAS	Tomahawk Mission Analysis System
TORAS	Total Operational Environment for Aircraft Systems
TPEP	TERCOM Placement & Evaluation Program
TPS	Target Planning System
TPSDD	Theater Planning Support Document Builder
TRAMS	Technical Radar Analysis Modeling Simulation
TRAP	Trajectory Analysis Program
TREE	Transient Radiation Effects on Electronics
TREGEN	DGZ Tree Generation
TRICOMS	TRIAD Computer System
TSC	time sensitivity codes
TTM	Tactical Target Materials
TTMP	Tactical Target Materials Program
TVS	Target Value System
UKLO	U.K. Liaison Office
USACOM	U.S. Atlantic Command
UTC	urgent targeting change
VA	Vulnerable Area
VLSTRAK	Vapor, Liquid and Solid Tracking
VN	vulnerability number
WAC	World Area Code World Aeronautical Chart
WAM	Weapons Allocation Model Weapons Assignment Model
WDB	World Data Bank
WEMS	Weapons Effects Modeling System
WMD	weapons of mass destruction
WPA	War Planning Analyses
WSI	war supporting industries
WSR	weapon system reliability

WVS	World Vector Shoreline
WWMCCS	Worldwide Military Command and Control System
XIDB	Extended Integrated Database

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William M. Arkin is a consultant to the Natural Resources Defense Council (NRDC) and a columnist for *The Bulletin of the Atomic Scientists*. Arkin has worked with NRDC since 1980 co-authoring and contributing to the five volumes of the *Nuclear Weapons Databook* series (1984, 1987, 1989, 1994), the standard technical reference work on nuclear forces and capabilities of the five acknowledged nuclear powers. Since 1987, he has written a column (with Robert Norris of NRDC) entitled "NRDC Nuclear Notebook" for each issue of *The Bulletin of the Atomic Scientists* monitoring the state of nuclear arsenals worldwide. His most recent book is *The U.S. Military Online: A Directory for Internet Access to the Department of Defense*, 2nd edition (Brassey's 1998).

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