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FINAL

MISSION NEED STATEMENT (MNS)

AFSPC 001-00

LAND-BASED STRATEGIC NUCLEAR DETERRENT

ACAT I

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1. Defense Planning Guidance Element. This Mission Need Statement (MNS) responds to Defense Planning Guidance (DPG) Update for Fiscal Years 2002-2007 and the 2001 Nuclear Posture Review (NPR) which direct the Air Force to pursue concepts for missile systems to begin replacing the Minuteman III (MM III) by 2020 and to the 1998 Defense Science Board (DSB) Task Force on Nuclear Deterrence which noted the Air Force needs a new intercontinental ballistic missile (ICBM) with production beginning around 2017. The DPG also directs incorporation of enhancements to respond to emerging threats and application of common technologies and components wherever possible. The fielding of a credible and effective land-based strategic nuclear deterrent force beyond 2020 supports the DoD corporate-level goals of shaping the international security environment and responding throughout the full spectrum of conflict by deterring hostile actors/activities in peacetime and in times of crisis. This force also will prepare the US for an uncertain future by maintaining US qualitative superiority in nuclear warfighting capabilities in the 2020-2040 time frame. This MNS also responds to the findings of the Nuclear Posture Review and Presidential Decision Directives, which reiterate the importance of robustly underwriting the concept of deterrence and its application to deterring the use of weapons of mass destruction (WMD). Applicable mission areas are 100 Strategic Warfare, 110 Strategic Offensive, and 111 Land-Based Strike.

2. Mission and Threat Analysis.

2.1. Mission. The primary mission of the land-based strategic nuclear deterrent force–ICBMs–in the current and projected security environment is to deter aggression against the United States, its forces abroad, and its allies and friends. Effective deterrence depends on real capabilities and perceptions of national will to respond to aggression through dissuasion, denial, and retaliation.

2.1.1. Strategic Deterrence. Nuclear weapons will continue to play a unique and indispensable role in US security policy. The bilateral 'nuclear balance' that occupied center stage in the past is now just the first of a range of factors driving the strategic calculations of the United States and Russia. US nuclear weapons still are required as a vital hedge against an uncertain future and contribute to deterrence of a wider and less predictable set of potential adversaries, especially those armed with WMD. Nuclear weapons are essential to ensure US security guarantees to friends and allies, providing greater stability in the international environment and promoting US non-proliferation goals. Our deterrence capability gives allies and friends the confidence necessary for normal political discourse and peaceful resolution of differences. The critical element of deterrence is our strategic nuclear forces, which complement our conventional capabilities by deterring any hostile foreign leadership with access to WMD from acting against our vital interests. Credible standing nuclear and conventional forces, defined as the forces able to carry out one's intentions should deterrence fail, cause potential adversaries to consider the consequences of pursuing aggression. Although the US and Russia continue to reduce their nuclear arsenals, our triad of strategic forces serves as a vital hedge against an uncertain future, a guarantor of our security commitments to our allies, and a deterrent to those who would contemplate developing or otherwise acquiring their own nuclear weapons. As stated in the National Military Strategy, "The US military must have capabilities that give the national leadership a range of viable options for promoting and protecting US interests in peacetime, crisis, and war." Thus, for the foreseeable future, the United States will continue to need a reliable, survivable, and flexible nuclear deterrent–survivable against the most aggressive attack; under highly confident, constitutional command and control; and safeguarded against both accidental and unauthorized use. Strategic nuclear weapons remain the keystone of US deterrent strategy.

2.1.2. Nuclear Triad. Our deterrent posture is one of the most visible and important examples of how the US can use its military capabilities effectively to deter aggression and coercion. Although the prominence of nuclear weapons in the nation's defense posture has

diminished since the end of the Cold War, nuclear weapons remain important as one of a range of responses available to deal with threats or use of nuclear, biological, chemical, and radiological weapons against US interests.

To deter a broad range of threats, our National Security Strategy states, "The United States will continue to maintain a robust triad of strategic nuclear forces sufficient to deter any potential adversaries who may have or seek access to nuclear forces – to convince them that seeking a nuclear advantage or resorting to nuclear weapons would be futile." The NPR and DSB reaffirmed the wisdom of preserving the complementary strategic triad of land-based ICBMs, sea-launched ballistic missiles, and strategic bombers. Each leg of the Triad contributes unique attributes that enhance deterrence and reduce risk. Land-based ICBMs provide prompt response, submarines provide survivability, and bombers provide flexibility. Together they comprise a robust deterrent that complicates potential adversaries' offensive and defensive planning. The Triad is also a synergistic force that provides protection against the failure or destruction of a single Triad leg.

2.1.3. Land-based Strategic Nuclear Deterrence. Today's land-based strategic nuclear deterrent force provides capabilities critical to the Air Force's vision of global vigilance to deter threats, strategic reach to curb crises, and overwhelming power to prevail in conflict. ICBMs are integral to the core competencies of global attack and precision engagement, which include the ability to hit an adversary's strategic centers of gravity directly. Along with global situation awareness, the ability to bring intense firepower to bear over global distances within minutes gives national leaders exceptional leverage and therefore significant advantages.

The aggregate features of a land-based strategic nuclear missile force contribute uniquely to stable deterrence. Such a force provides operational characteristics of prompt response; high reliability; high accuracy; rapid and flexible retargeting; and high state of readiness for employment under positive command and control (C2) through the President and Secretary of Defense. Utilizing dispersed and hardened facilities, as well as assured connectivity, the ICBM system affords survivability against all but the most massive, complex, and perfectly executed attacks. The inherent difficulty for an adversary to eliminate the ICBM force underwrites deterrence in all scenarios. It is particularly critical during rapidly developing crises in which other Triad legs may not have generated to full alert availability. For these reasons, the DSB concluded that the ICBM force is of continually increasing deterrent value as the nuclear force becomes smaller. Without such a land-based strategic nuclear deterrent force, the prospect of destroying the bulk of the US' strategic infrastructure with a handful of weapons might be too tempting to a potential adversary in a crisis. These characteristics, in both qualitative and quantitative terms, must be preserved in the future land-based strategic nuclear deterrent force.

The unpredictable threat environment after 2020 dictates increased flexibility and potential for mission growth in the land-based strategic nuclear force. As identified in Air Force Space Command's 1999 Space Force Applications Mission Area Plan, a future credible land-based strategic nuclear deterrent force must be capable of rapidly holding at risk a wide range of surface and subsurface targets to include, but not limited to, fixed soft and hard targets; hard and deeply buried targets; chemical and biological production, storage, and delivery system facilities; strategic relocatable targets; heavily defended targets; and targets that emerge unexpectedly on short notice. The land-based strategic nuclear deterrent force must be structured to counter these existing and emerging targets on a global scale by providing on-demand force application, flexible force application, and flexible effects. Quantum advances in information processing and advanced technologies may produce warfighting capabilities that include delivery means for payloads with self-contained sensors; accuracy to enable sufficient lethality within the sub-kiloton yield; search, loiter, and redirection capability; and/or enhanced defense penetration. Not only must the future land-based strategic nuclear deterrent force continue to provide the robust capabilities which exist today (i.e., responsiveness, damage expectancy, payload margin, operational flexibility, and cost-effectiveness), but it must also take advantage of emerging technologies to ensure deterrent effectiveness in an uncertain future strategic environment.

The MM III weapon system has been in the inventory for over 30 years, and is undergoing extensive life extension programs to maintain its viability through 2020. However, in the 2020 time frame, MM III components again will begin to age out and spare items will have been consumed due to flight testing and other destructive analyses; therefore, provisions to deal with system aging, asset depletion, and emerging mission requirements must begin now to support a credible land-based strategic nuclear deterrent force in the 2020 timeframe and beyond.

2.2. Threat. Described in DIA's *Global Assessment: 2020*, the world progression toward the 2020 time frame will be characterized by turmoil with more challenges to US interests, diffused power relationships, less cohesive and sustainable alliances, and emerging forms of asymmetric warfare. Historic rivalries will continue to provoke crises, in which increasingly more assertive and capable entities (including non-state, non-traditional actors) will vie for greater influence within their geographic regions. The ability to influence and/or deter these entities may depend on the ability to employ more flexible and reliable strategic weapons systems.

2.2.1. Regional and Global Competitors. Beyond 2015, there is the possibility that a regional great power or global competitor may emerge. Some see Russia and China as having such potential, though their respective futures are quite uncertain.

2.2.2. Strategic Nuclear Threat. The strategic nuclear threat to the US will endure, but its character has and will continue to change significantly. While the number of Russian strategic warheads is predicted to shrink dramatically, Moscow will retain a potent delivery capability and reliance on strategic nuclear forces. China will modernize and expand its relatively small and dated strategic deterrent force and has openly advocated the use of asymmetric warfare including high altitude electromagnetic pulse (HEMP/EMP) against technologically superior US forces. Though less certain, adversaries–notably North Korea and Iran–may develop and field nuclear-armed missiles with intercontinental range.

2.2.3. Regional Threat. Regional challenges to US interests and security are many. As a minimum, major regional powers may pursue military modernization and integrate new technologies into forces and capabilities. The threat posed by regional weapons of mass destruction–already the greatest threat to deployed US forces–will increase. A few states of concern may develop a nuclear capability, chemical and biological weapons will continue to be proliferated, and the numbers of longer-range theater ballistic and cruise missiles will increase significantly, particularly in the Middle East. Additionally, an adversary's potential use of other forms of asymmetric warfare, such as HEMP/EMP and information warfare, also poses a significant regional threat to US and allied forces. This dynamic has the potential to fundamentally alter theater force balances, the nature of regional war and conflict, and US contingency planning and execution. The US must be prepared to deter such regional powers and states of concern from employing these types of weapons.

2.2.4. Threat Environment. The primary threat to the US land-based nuclear deterrent force will continue to be from strategic ballistic missiles (ICBMs and SLBMs) with sufficient combination of yield and accuracy to hold the force at risk. Other offensive threats will include information operations, unconventional warfare, and other effects of nuclear detonations. Inflight threats to reentry vehicles will come from anti-ballistic missile defense systems, as well as foreign denial and deception programs, target hardening and other protection measures.

2.2.5. Future Uncertainty. The global military threat over the next 20 years will be diffuse and ambiguous. We can never know with certainty where or when the next conflict will occur, who our next adversary will be, how an enemy will fight, who will join us in a coalition, or precisely what demands will be placed on US forces. A number of "wild card" threats could emerge to put US interests at risk. Such threats range from the emergence of new technologies that neutralize or degrade some of our military capabilities to the loss of key allies or alliances and the unexpected overthrow of friendly regimes by hostile parties.

2.2.6. Threat Descriptions. Additional threat descriptions can be found in the following documents: *Global Assessment: 2020* (U), DI 1570-6-00, June 2000 (S/NF); *ICBM System Threat Assessment Report* (U) NAIC-1574-0950-02, January 2002, (S/NF/FRD); National Intelligence Estimate (NIE) 97-13/1, October 1997, (S/NF); *Worldwide NBC Weapons and Missile Proliferation Threat* (U), DI-1569-15Q-99, June 99, (S/Rel US/UK/CA/AS); *Threat Environment Projection: Chemical and Biological Warfare, 2005-30* (U), DI-1650-43-00, March 2000, (S/NF/X1); *Hard and Deeply Buried Target Defeat Capability System Threat Assessment* (U), NAIC-1574-1091-98, August 1998, (S/NF); *Nuclear Capability Projection for the Non-Declared Nuclear Weapons States and Selected Rest of World Nuclear Programs: 1999-2018* (U), DI-1610-22-99-SI, May 1999; (TS/SCI/NF); and *Space Systems Threat Environment Description* (U), NAIC-1574-0727-01, January 2001, (S/UO/FRD). Information regarding threats to automated information systems integral to a land-based strategic nuclear deterrent force are in the *Automated Information Systems Threat Environment Description* (U), NAIC-1574-0210-00, September 2000, (S/NF).

3. Non-materiel Alternatives. Review of doctrine, operational concepts, tactics, organization, and training identified no non-materiel alternatives besides changes in national nuclear policy and deterrence strategy that would contribute to satisfying this mission need.

4. Potential Materiel Alternatives. Upon completion of ongoing life-extension programs, the MM III's projected service life will be extended to approximately 2020. After that time, a follow-on land-based strategic nuclear deterrent force will be needed. Within the context of the existing Minuteman basing infrastructure and deployment concepts, which remain key to the deterrent effectiveness and affordability of the system, two potential materiel alternatives appear feasible.

4.1. Minuteman-based Variants. Another round of selected subsystem life extension programs or new development of some MM III subsystems and/or components could be initiated. A comprehensive assessment of all sub-systems and components will determine whether life extension is feasible and practical or new subsystem and/or component development is required.

As sub-systems are replaced, updates in component technology may be inserted to meet emerging requirements. To augment the current ballistic delivery of reentry vehicles, a new post-boost section incorporating advanced technologies could be designed into the existing missile system to provide additional operational flexibility. Potential payloads could include the Mk12A, Mk21, a newly designed reentry vehicle that could incorporate low or multiple yield weapons, and a trajectory shaping vehicle (TSV) carrying weapons capable of holding at risk the range of targets previously described and each delivered with enhanced accuracy. Any Minuteman-based variant must also consider basing infrastructure, ground equipment, command and control systems, information assurance, planning systems, logistical support systems, intelligence support capabilities, security, and training systems.

4.2. New Missile System. This option involves design/integration of a new missile system. Some components may be taken from existing weapon systems or commercial off the shelf (COTS) technology, while others would be new designs or designs using common components and technologies with other services. A new missile system should take advantage of the latest technologies and provide an affordable total cost of ownership. Finally, a new missile system, depending on design, could also accomplish projected mission requirements the current system cannot, such as extended range, heavier payloads, and delivery of previously mentioned post-boost sections. Any proposed new system must also consider basing infrastructure, ground equipment, command and control systems, information assurance, planning systems, logistical support systems, intelligence support capabilities, security, and training systems.

5. Constraints.

5.1 Policy and Arms Control. All systems and employment concepts must comply with US national policies and international obligations, including arms control treaties in effect at the time of system deployment.

5.2. Stability. The system must contribute to enhancing the stability of nuclear deterrence. The Defense Science Board's Task Force on Nuclear Deterrence praised the value of a sizable force of single warhead silo-based ICBMs for its stabilizing effect on nuclear deterrence. The system must preserve the composite qualitative and quantitative force characteristics that are instrumental to robust deterrence within a nuclear triad.

5.3. Operating Environment. The system must be able to perform all missions while operating in the most hostile environments, up to and including the conditions created by a nuclear exchange. The equipment/systems shall be electromagnetically compatible both internally and with other systems in its operational environment, such that system operational performance requirements are met.

5.4. Logistics. The design of all life extension efforts and modifications must be inherently reliable and maintainable in order to minimize life cycle costs. All efforts must equal or exceed current reliability, maintainability, and performance standards.

5.5. Nuclear Surety. The changing threat environment intensifies the need to ensure safe handling of nuclear weapons; avoidance of unauthorized, accidental, or inadvertent launch; and physical security of nuclear weapons facilities. System modifications must not degrade nuclear surety and should enhance it whenever possible.

5.6. Command, Control, Communications, Computer, Intelligence, Surveillance, and Reconnaissance (C4ISR). All new or modified hardware and software affecting system C4ISR interfaces must be developed to enhance interoperability in accordance with the standards specified in DoD Joint Technical Architecture (JTA). In addition, all installed communications-electronics equipment/systems including any commercial or non-developed item (NDI) subsystems shall comply with all DoD, National and International spectrum management policies and regulations. Critical C4I systems must be sufficiently protected to survive the most severe operating environment to provide maximum flexibility and security for command and control of a US nuclear response. Pre-design/production planning to incorporate EMP hardening in future equipment acquisitions is necessary to ensure interoperability.

5.7. Manpower. Programs must be devised and implemented with due attention to manning constraints in operations, maintenance, support, and security forces. Innovative concepts to reduce manpower must be explored.

5.8. Operations and Maintenance Costs. All programs must endeavor to reduce operations and maintenance costs in line with the Air Force's weapon system cost reduction process.

5.9. Security. Program protection must be applied throughout the system's life cycle. System security measures must be applied to insure the integrity, availability, and integration of facilities and equipment and must continue to meet or exceed DoD security requirements.

5.10. Information Assurance. Information Assurance (IA) shall be an integral part of all system design, implementation and interoperability efforts thus allowing appropriate security measures to protect mission data and system resources. This includes protection of information facilities and equipment from all known threats. The system must incorporate defensive IA capabilities that provide the availability, integrity, authentication, confidentiality and non-repudiation of the information exchanged and used. This includes characteristics needed for restoration through protection, detection and reaction capabilities.

5.11. Environment, Safety, and Health. Systems shall comply with all federal, state, and local environmental laws, regulations and executive orders regarding safety, health, pollution, and waste minimization. Actions will be taken to minimize the use of hazardous/environmental impact materials and manufacturing processes. Environmental analysis of weapon system acquisition, testing, operations, and disposal must ensure impacts are identified and minimized whenever possible

5.12. Commonality. Programs must apply common technologies and components wherever possible. Commonality between the Air Force and Navy Strategic Systems is necessary to obtain synergy and

prevent duplication of effort, but should guard against a single fault jeopardizing the viability of the ICBM and sea-launched ballistic missile legs of the Triad.

6. Joint Potential Designator. Joint interest.