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BALLISTIC MISSILE PROLIFERATION  
A NATIONAL SECURITY FOCUS FOR THE 21ST CENTURY

by

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## ABSTRACT

AUTHOR: Joseph F. H. Peterson

TITLE: Ballistic Missile Proliferation - A National Security  
Focus for the 21st Century

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The global proliferation of ballistic missiles and weapons of mass destruction (WMD) has become one of the most immediate and dangerous threats to U.S. national security. Ballistic missiles were used in four of the last six major wars. Some 190 missiles were fired by Iraqis over a six week period at Iranian cities in 1988, during the "War of the Cities". Iraq's firing of Scuds against coalition forces and Israel during the Gulf War provided a vivid reminder of the threat these weapons can present to the world community. During the 1980s, many Third World countries assigned a high priority to the acquisition of ballistic missiles. By 1991, more than 20 of these nations either possessed ballistic missiles or were attempting to obtain them. Today 43 nations possess ballistic missiles. Seventeen of these probably have a nuclear weapon capability, with 20 of them possessing also a chemical or biological capability. This paper seeks to: define the military challenge ballistic missiles represent; review current U.S. counterproliferation and nonproliferation initiatives; and, finally make recommendations on other potential methods or considerations to reduce ballistic missile proliferation.

**Ballistic Missile Proliferation**  
**A National Security Focus for the 21st Century**

**I. INTRODUCTION**

The demise of communism and the Soviet Union has replaced global predictability with regional instability, and fostered great uncertainty in the "New World Order". The East-West bipolar superpower competition which directed United States national foreign policy, strategy, doctrine, weapons acquisition plans, and force structure is gone. Cold war frictions that once attenuated a number of political, territorial, ethnic, religious, and other conflicts have given way to anarchy.

Global war is unlikely, but the resurfacing of regional conflicts and a willingness by the parties involved to resolve their disputes by military means threatens world stability. The Gulf War, and conflicts in Bosnia-Herzegovina and Somalia are glaring examples of this instability. In 1992, thirty major armed conflicts<sup>1</sup> were waged around the world. All of these except one (India-Pakistan) were intra-state.<sup>1</sup> By the end of 1993, the United States (U.S.) military had participated in 5 of the 17 ongoing United Nations (U.N.) peace keeping operations: Iraq-Kuwait (UNIKOM), Israel-Egypt-Jordan-Syria (UNTSO), Western Sahara (MINURSO), the former Yugoslavia (UNPROFOR), and Somalia (UNOSOM II), providing nearly 6 percent of the over 70,000 U.N.

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<sup>1</sup> A major conflict is defined as involving prolonged combat between organized armed groups, and resulting in at least 1000 battle related deaths during the entire conflict.

personnel deployed worldwide.<sup>2</sup> Although major conflicts worldwide have declined slightly since 1989, recent experience demonstrates that the world remains a volatile, chaotic, and dangerous place. Our ability to estimate when or where the next conflict or challenge to our vital interest will occur is less predictable now than it has been for the past four plus decades. Secretary William Perry, in a major foreign policy speech in Munich three days after being sworn in as the Secretary of Defense, said the West must not become complacent, even though the Cold War is over. "The warning signs of history are all around us...."<sup>3</sup>

National security requirements therefore have undergone fundamental changes in order to address this new world security environment.

## II. THE NEW SECURITY ENVIRONMENT

The new security environment is characterized by the following parameters: Politically, domestic issues are a priority. We continue to operate on a bilateral basis internationally when required, but the need to be "penny wise" generates renewed emphasis for multilateral and more burden sharing endeavors. Working closely with our allies we are challenged to nurture and support fragile emerging democracies throughout the world but in particular in Eastern and Central Europe. Promoting the Middle East peace process remains a focus. Finally, we have assumed a leadership role in encouraging



democratization throughout the world community. Economically, we face the challenge of correcting a large national budget and trade deficit. Maintaining productivity levels, controlling inflation, and working within tighter budget constraints are key components to these goals. We will also continue to foster an open and competitive fair trade system. Militarily, today's challenges are more diverse and less predictable than ever before. Global security is threatened by regional instability fueled by historic rivalries. The proliferation of advanced conventional arms, ballistic missiles, and weapons of mass destruction (WMD) are great contributors to this instability. Terrorism and the international drug trade will also compete for military resources.<sup>4</sup> Operations other than war (OOW) are now an integral part of our doctrine. Lastly, we are compelled to maintain our conventional and technological supremacy while anticipating greater defense cuts.

### III. PURPOSE

The purpose of this paper is: first, to define the military challenge of ballistic missile proliferation; second, to review existing U.S. counter and nonproliferation initiatives; and third, to recommend other potential methods/considerations to reduce ballistic missile proliferation.

### IV. DEFINING BALLISTIC MISSILE PROLIFERATION

A. The Nature of the Problem. Global proliferation of

ballistic missile technology and weapons of mass destruction has become one of the most immediate and dangerous threats to U.S. national security.<sup>5</sup> The 1993 National Security Strategy of the United States, states that:

"In the post-Cold War era, one of the most threatening national security challenges is the spread of weapons of mass destruction and the means to deliver them."<sup>6</sup>

1. Delivery Means. Advanced aircraft, submarines, and ground based ballistic missiles are the principle means available for delivering weapons of mass destruction. By definition, a ballistic missile is "an unmanned rocket-driven missile which follows a ballistic trajectory towards its designated target".<sup>7</sup>

The dangers of ballistic missiles derive from their capabilities. These delivery systems afford surprise, speed, and can strike deep into friendly territory. When combined with WMD, they are intimidating because we have little or no means to defend against them.<sup>8</sup>

A continuing trend since the mid-1970s has been the proliferation of ballistic missiles and WMD in areas of great political and military instability. Ballistic missiles were used in four of the last six major wars (Afghanistan, the Arab-Israeli War of 1973, the Iran-Iraq War, and the Gulf War).<sup>9</sup> The use of ballistic missiles or theater ballistic missiles (TBMs) by both sides in the Iran-Iraq war, culminating in the "War of the Cities" of early 1988, heightened world wide awareness of the threat posed by ballistic missile proliferation. Six Third World countries have fired ballistic missiles at opponents. This

includes Iran, Iraq, Egypt, Syria, Libya and Afghanistan.<sup>10</sup> Seven nations (Brazil, China, India, Indonesia, Israel and Russia) have operational space launch programs. A cause for concern is the apparent direct correlation between states intent upon acquiring ballistic missiles and those pursuing NBC programs.<sup>11</sup>

Technically competent and motivated technicians in many countries are striving to develop domestic systems capable of delivering nuclear and chemical payloads.<sup>12</sup> Missile proliferation has reached epidemic proportions. Current trends suggest that the number of countries with missiles will increase through the 1990s and into the 21st century. System capabilities will also continue to grow.<sup>13</sup> Since 1989, the number of countries possessing intermediate range ballistic missiles, with ranges from 70km to 4750km, has increased from 23 to 34 (See Enclosure 1).<sup>14</sup> All of these increases took place in Third World countries, and rose the total number of nations possessing ballistic missiles of all ranges to 43. China, France, Kazakhstan, Russia, the United Kingdom, Ukraine and the U.S. also have intercontinental range ballistic missiles (ICBMs) in service or development.<sup>15</sup>

Domestic missile manufacturing programs are on the rise, but generally rely on foreign technical assistance and imported technologies. This often entails collaboration among emerging Third World producers. Versions of operational weapons have been refined, e.g., the Iraqi-Egyptian-North Korean cooperation in

improving Scuds, and also the extensive Brazilian assistance to Iraq in missile research and development.<sup>16</sup> Missile engineering skills in Third World countries are also developing. Therefore, new missiles are likely to be more accurate, reliable and lethal than the existing stock.<sup>17</sup>

A disturbing factor of ballistic missile proliferation is that it increases the incentive to strike first, either as part of a premeditated offensive thrust or as a preemptive action during crisis.<sup>18</sup> Additionally, they can also be used as weapons of last resort or terror when a nation perceives it has no other option or wants to make a political statement. This will be discussed in depth later.

2. Weapons of Mass Destruction. There are 17 declared nuclear weapons states (See Enclosure 2).<sup>19</sup> Across the former Soviet Union 27,000 nuclear warheads are now under guard by various military units.<sup>20</sup> 1,832 of these are located in the Ukraine.<sup>21</sup> The Ukraine's reluctance to carry out the provisions of START I and the transfer of their nuclear weapons to Russia is of particular concern. The perceived reasons for this indiscretion include: First, a need to flex the muscle of their new found independence. Second, to assuage a potentially threatening Russian Federation, its main security concern, from challenging their sovereignty or present borders. Finally, the lucrative opportunity to gain cash compensation (possibly reaching \$2 billion) for the highly enriched uranium fissile material inside these weapons.<sup>22</sup> A cash agreement, between the

Ukraine and Russia, was agreed upon for the conclusion of this transfer in September of 1993, however, until this transaction is completed, the impact of non-compliance is held in abeyance.

*Chemical and biological weapons*, present a much lower profile than nuclear weapons, but are no less volatile or threatening. The proliferation of chemical weapons is a disturbing development. They are inexpensive and the technology for manufacturing chemical weapons is widely available, and shares much of the infrastructure required for modern chemical, pharmaceutical, or other commercial industries. In the Third World, chemical weapons are seen as the "poor man's nuclear weapon". Three of 22 declared nuclear weapons states possess a chemical or biological capability. An additional 13 of these probably also possess the capability.<sup>23</sup> Chemical weapons are not easily detected, but recent use is widely documented. Since 1980, their use is suspected in Ethiopia (1980-83), Afghanistan (1980-84), Chad by the Libyans (1987), during the Iran and Iraq War (1983-88), and against the Kurds in Iraq (1988). The attractiveness of these weapons to terrorist, and the use by Third World countries is a significant concern.<sup>24</sup>

It is patently obvious that nuclear, biological and chemical (NBC) weapons pose a great danger to world security. Combined with the proliferation of ballistic missiles as a delivery means, they provide a potential aggressor status, independence and power. As such, ballistic missiles potentially threaten U.S. military forces operating in and around Third World nations, as

well as U.S. allies.

A prohibitive aspect of missile proliferation is the high cost of missile development. It was estimated that Argentina would have spent \$3.2 billion to develop and build 400 Condor missiles, or about \$8 million per missile. Development costs alone would have exceeded \$1 billion. Most Third World countries cannot afford to devote large sums of money to projects of this magnitude. However, it has become easier for interested countries to obtain from each other complete systems, or the technology, plant facilities, and even the workforce to conduct missile projects.<sup>25</sup> Additionally, even countries who build their own missiles purchase off-the-shelf components developed and built by other countries.

3. Cruise missiles. Probably the most threatening aspect of this problem is the development and fielding of *cruise missiles*.<sup>26</sup> The growing attractiveness of cruise missile technology results from the specific characteristics of such weapons and the growing availability of the technologies to produce them.<sup>27</sup> Cruise missiles are less expensive, harder to detect, and have a guidance system (the Global Positioning System (GPS)) that provides near pinpoint accuracy. They are particularly well suited for the delivery of NBC weapons. Seven countries currently have cruise missile programs ( Belarus, France, Kazakhstan, Russia, Syria, Ukraine and USA). An additional 11 countries ( Brazil, China, Germany, Iraq, Israel, Italy, Japan, North Korea, Sweden, Taiwan, and UK) have cruise

missile programs in development.<sup>28</sup> (See also Enclosure 1)

**B. Motivation for Procuring Missiles.** The motivation for missile procurement includes *prestige, deterrence, increased national autonomy, and upgrading war-fighting capabilities.*

1. Military and Political Prestige. Possession of ballistic missiles is seen by many Third World states as a powerful world status symbol of technological achievement and military prowess, and even as a rite of national passage out of technological backwardness.<sup>29</sup> More important than the possession of missiles, however, is the ability to develop and produce them. Such capabilities not only confirms modernization, but validates that a country has access to the same technology critical to superpowers.<sup>30</sup> Thus, in India, following the launch of the 2,500km Agni in 1989, one official stressed that the "Agni's role as a weapon is the least of its roles. It is a confidence builder and a symbol of India's assertion of self-reliance and not merely in defense but in the broader international political area as well."<sup>31</sup> The same applies to Saudi Arabia's purchase of the Chinese DF-3A (or CSS-2) with a 2,500km range once denied sale by the US of the Lance missile with a 100km range. The disparity in capabilities of these two systems suggests that operational considerations played a much smaller role in the decision process than the obvious importance tied to possessing some kind of ballistic missile.<sup>32</sup> It also appears that no more than 60 missiles were acquired by the Saudi's, a number of little strategic significance.<sup>33</sup>

2. Deterrence. Development of a missile deterrent force based on the threat of retaliation coincides with the same pragmatic reasoning process used in more industrialized states. Ballistic missiles enhance defensive capabilities and the potential to secure the homeland from external threats. Judge William H. Webster, the former Director of the Central Intelligence Agency (CIA), noted that, because ballistic missiles cannot be destroyed by existing air defenses, it is likely that "the deterrent value of missiles is higher than for manned aircraft."<sup>34</sup> Iranian Prime Minister Hashemi Rafsanjani, in March 1988, stressed that Iran's main means of dealing with the Iraqi missile threat was to bolster its own missile industries. Pakistan's Minister of State for Defense, Ghulam Sarwar Cheema, when asked why Pakistan was developing ballistic missiles, replied that the country had "to have an antidote for what our enemy [India] next door has."<sup>35</sup> The Saudis have implied that their missiles are to deter Iranian attacks, and Israel has been explicit in stating that its deterrent is directed against their Arab enemies. These weapons garner a guarantee of national survival in the minds of Third World leaders. Successful deterrence, however, is predicated upon the assumption of prudent rationality on the part of the object of deterrence. Unfortunately, this assumption cannot be taken for granted with respect to the likes of Moammar Gadafi, Ayatollah Komeini, Kim Il Sung, or Saddam Hussein.<sup>36</sup>

3. Increased National Autonomy. Many Third World



states believe that the prestige and status associated with such projects as rocket research will help them achieve broader political objectives. This includes an expanded regional role and greater attentiveness to their concerns on the part of more powerful nations. This is true in South Africa, where rocket research has been used to emphasize "the high level of technological advancement in South Africa, a level that is remarkable for a small nation that is rooted in a predominantly Third World environment."<sup>37</sup> The same applies to Brazil who has no obvious target against which to direct their missiles. These weapons also serve to dissuade outside intervention in regional affairs. It is possible that this could be the primary motivation for North Korea's quest to obtain nuclear weapons. They may believe it necessary to arm their ballistic missiles, in order to neutralize the nuclear forces arrayed against them, including those of the US.

4. Warfighting Capability. Even if never fired, ballistic missiles confer strategic status to the countries that possess them.<sup>38</sup> They afford the offensive capability to attack important military targets deep in the enemy's rear, and the advantage of surprise. Thus, a country concerned about how it is perceived militarily may be tempted to acquire missiles even if it has no plans to use them. This may have been the genesis for the Saudi purchase of the Chinese DF-3A described above.

A significant portion of the missiles in service and now under development in the Third World, however, are clearly

intended for use against hostile forces."<sup>39</sup> These missiles generally have ranges of 300KM or less. Egypt and Syria employed FROG-7s and other rockets against Israeli forces in the 1973 Arab-Israeli War. Afghanistan has extensively employed Scud-B missiles against guerilla troop concentrations.

**C. Other Factors Influencing Ballistic Missile Proliferation.**

1. Sale for Profit. Ballistic missile proliferation is also fueled by profit motivation on the part of seller nations. Conventional arms sales is "big business" with 1992 world exports exceeding \$18 billion (US dollars).<sup>40</sup> The United States was the leading exporter of conventional weapons world wide with exports totalling \$8.4B, followed by Russia \$2B, Germany \$1.9B, China \$1.5B, and France \$1.1B.<sup>41</sup> Companies whose products are no longer in demand by domestic armed forces have gravitated to export markets. Most Third World nations who have ballistic missiles originally imported them as complete systems. Almost all of them came from either the former Soviet Union (FSU), the United States, or China.<sup>42</sup> The FSU was the largest missile supplier, exporting hundreds of SS-21, SCUD-B, and FROG SSMs to the Middle East and Asia. Additionally, a secondary market in missiles has also developed with Third World countries exporting to other Third World allies. Thus Iran acquired its initial missile capabilities in 1985 by obtaining SCUD-B missiles and launchers from Libya.<sup>43</sup> These transfers are likely to occur more often in the future as Third World domestic ballistic

missile production capabilities mature.

2. Dual-use-technologies for space launch vehicles.

The technology required to produce civilian space launch rockets is the same technology used to produce ballistic missiles for military application and visa versa. Therefore a country that builds rockets capable of placing satellites in orbit can also produce SSMS. Brazil, China, India, Indonesia, Israel, the US and Russia currently maintain operational space launch vehicle programs. Since there is no clear method to distinguish national intentions with regard to a space program, technology acquired for peaceful space efforts could be transferred to military uses. Examples of this potential transfer capability can be found in the Brazilian use of Sonda sounding rockets, originally built for their civilian space program, to make artillery rockets. Because of their similar technological base, military missiles can also be used for civilian applications. This was the case in the Israeli use of a modified version of the Jericho military ballistic missile to launch the Ofeq satellite into space in 1988.<sup>44</sup>

3. Technology Transfers. Countries intent of building missiles can obtain needed technical assistance from numerous sources. Most technology transfers originated in four countries, Italy, France, Germany, and China. Transfers among Third World nations are also growing in significance, and according to the CIA, Third World countries are "extensively sharing technology and... increasingly pooling their resources and technical know-

how."<sup>45</sup>

Technology smuggling is also on the rise in the U.S., particularly with shrinking Pentagon budgets tempting unscrupulous businessmen and contractors to find other markets and buyers overseas.<sup>46</sup> Probably the area of most concern, however, is the surplus of technical expertise for hire from the FSU. These highly skilled technicians and scientists possess the full range of talent necessary to build complex ballistic missile systems. The lure of financial stability and a better standard of living provides adequate reason for their involvement in these programs.

D. A Clear and Present Danger. Increased reliability, lethality, and accuracy of ballistic missiles possibly armed with WMD, coupled with a first strike propensity in the hands of irrational leaders, heightens concern over U.S. national and international security interests.

Hostile nations with limited means are attracted to ballistic missiles and WMD as a way to extend their strategic reach. With little effort they can create political and psychological instability for an adversary, while generating cautious respect and the perception of "world power" status. Consequently, nations possessing a limited quantity of ballistic missiles may use them for their political rather than military value.

A clear and present danger comes today from a select group of Third World nations possessing ballistic missiles and WMD -

North Korea, Iran, and Iraq. They represent the radical "Weapon States," which Charles Krauthammer has said "will constitute the greatest single threat to world security for the rest of our lives."<sup>47</sup> North Korea is capable of ranging the entire peninsula with their Scuds, and also Tokyo with the No Dong-1. If the Taepo-Dong-2 achieves its projected maximum range, the *North Koreans* will also be able to range Guam. Iran and Iraq are both capable of launching ballistic missiles into NATO's southern tier (this includes Italy, Greece, and Turkey), and Israel, Egypt, Jordan, Saudi Arabia, Jordan and Kuwait to name a few.

Historical experience, plus what Third World leaders have said about their intentions, suggests that the following are target priorities for Third World ballistic missiles:

"1.) Cities, especially capital cities; 2.) Large military bases, especially air fields; 3.) Fixed troop staging areas (e.g. Israeli Self-Defense Force mobilization depots, US pre-positioning facilities at Diego Garcia); 4.) Fixed surface-to-air missile sites, with the aim of opening corridors for aircraft penetration; and 5.) Large industrial facilities that are essential to a nation's most basic economic well being (e.g. oil storage facilities or refineries)."<sup>48</sup>

The next section of this paper will evaluate current initiatives and US policies regarding ballistic missile proliferation.

## V. U.S. COUNTERPROLIFERATION AND NONPROLIFERATION INITIATIVES

### A. Background.

The Bottom-Up Review, published in October 1993, by Secretary of Defense, Les Aspin, provides a comprehensive review of the nation's defense strategy, force structure, modernization,

infrastructure, and foundations. First and foremost, it provides the direction for shifting America's focus away from a strategy designed to meet a global Soviet threat to one oriented toward the new dangers of the post-Cold War era.<sup>50</sup> Four chief threats to the US were identified. Two of these are pertinent to this paper. They are: First, the increased threat of proliferation of nuclear weapons and other weapons of mass destruction; and second, regional dangers posed by the threat of aggression by powers such as Saddam Hussein's Iraq.<sup>50</sup> The new nuclear danger is defined as possibly a handful of nuclear devices in the hands of rogue states or even terrorist groups.<sup>51</sup> In his speech to the UN General Assembly in September 1993, President Clinton said,

"One of our most urgent priorities must be attacking the proliferation of weapons of mass destruction whether they are nuclear, chemical or biological; and the ballistic missiles that can rain them down on populations hundreds of miles away. ...If we don't stem the proliferation of the world's deadliest weapons, no democracy can feel secure."<sup>52</sup>

The three successful approaches used to deal with the old nuclear threat were: deterrence, arms control and a nonproliferation policy based on prevention.

#### **B. Nonproliferation.**

"U.S. nonproliferation policy is guided by four principles:

- \* Build on existing global norms against proliferation and, where possible, strengthen and broaden them.
- \* Focus special efforts on those areas where the dangers of proliferation remain acute, notably the Middle East, South Asia, and the Korean Peninsula.
- \* Seek the broadest possible multilateral support, while reserving the capability for unilateral action.
- \* Address the underlying security concerns that motivate the acquisition of weapons of mass destruction, relying on the entire range of political, diplomatic, economic, intelligence, military, security assistance, and other

available tools."<sup>53</sup>

Our current policy of counterproliferation includes these features of prevention, and adds a fourth pillar - that of protection, to provide the capability to act in the event prevention fails.

To add visibility and oversight to this effort the Strategic Defense Initiative Organization (SDIO) has been changed to the Ballistic Missile Defense Organization (BMDO), and two new positions, the Assistant Secretary of Defense for Nuclear Security and Counterproliferation (ASD(NS&CP)), and the Director for Military Support in the intelligence community's nonproliferation center, has been created.

#### C. Counterproliferation.

"Counterproliferation is a coherent strategy to prevent countries from acquiring weapons of mass destruction through nonproliferation regimes, export controls, and political persuasion, or, should our efforts to prevent the acquisition of these weapons fail, to deter or destroy them prior to their use against our forces or to reduce their military effectiveness should they be used."<sup>54</sup>

U.S. counterproliferation initiatives include measures to improve: intelligence for monitoring and responding to WMD; U.S. ability to destroy, seize, or disable NBC weapons arsenals and their delivery systems; theater missile defenses (TMD) and national missile defenses (NMD); passive defenses in the event U.S. forces are exposed to biological or chemical weapons; and, technologies to detect weapons transported covertly into the U.S. by terrorists.<sup>55</sup> The component parts of our counterproliferation program can be divided into two areas, i.e.,

prevention and protection policies. A discussion on key elements of this program follows.

1. Prevention. Prevention efforts seek to reduce the motivation to acquiring WMD and missiles by making it difficult to acquire the technology and knowledge needed to build them. This process includes: efforts to dissuade non-WMD states from acquiring WMD through emphasis on the economic, military, and political costs of proliferation, positive/negative security assurances and guarantees, security assistance, and public diplomacy; denial through export controls, interdiction and disruption of supply networks; arms control; and international pressure via sanctions, isolation, publicizing violations and intelligence sharing.<sup>56</sup>

a. Arms Control. Current initiatives focus on creating a framework for cooperation, reducing the development of ballistic missiles, improving verification regimes, and controlling the supplier nations who contribute to the proliferation of ballistic missiles and weapons of mass destruction. Missiles have traditionally been singled out for more stringent export control. President Ronald Reagan, in November 1982, signed National Security Decision Directive (NSDD)-70, calling for the investigation of ways to control missile proliferation. This led to a significant agreement among the group of seven (Canada, France, Germany, Italy, Japan, the United Kingdom and United States) establishing restraints for missile-related exports. Formalized, on 16 April 1987, as the



*Missile Technology Control Regime (MTCR)*, MTCR provides guidelines to control the export of missile equipment and technology that could contribute to a missile system (cruise or ballistic). This regime targets missiles capable of delivering nuclear weapons with a payload greater than 500 kilograms and a range greater than 300km. MTCR guidelines address complete rocket systems, sub-systems, and specifically designed production facilities and equipment.<sup>57</sup> Since its signature, 15 other countries have supported or become partners to this accord. They include Australia, Austria, Belgium, Denmark, Finland, Greece, Ireland, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, and Switzerland.

The original purpose of the MTCR was to limit the risk of nuclear proliferation by controlling transfers that could make a contribution to nuclear weapons delivery systems other than manned aircraft. MTCR is mandatory only in the sense that signatories are obliged to consider it in making decisions on exports specified items and technologies. However, since the parties are all themselves sovereign states and no policing function exist except for national legislation, there are no sanctions for non-compliance.<sup>58</sup>

Successes beyond the voluntary participation and restraints accepted by the signatories include: Cancellation of the Argentina Condor project<sup>59</sup>, and recent efforts by the 22 partners of the MTCR to adopt revised guidelines extending the scope of the regime to include missiles capable of delivering biological

and chemical weapons. These initiatives are encouraging.<sup>60</sup>

MTCR has contributed to an increasing awareness of the missile proliferation problem among western suppliers. Recent missile development trends and the inability of member nations to control their domestic exports<sup>61</sup>, suggest that although it has been a valuable tool in slowing proliferation, it is incapable of stopping it.

Criticism of the MTCR include: the need to expand export controls to any offensive military application of ballistic missile technology (conventional + NBC); its failure to take into consideration missiles technology for civilian space programs; the non-legal binding nature of the program; that all major suppliers, like Russia, North Korea, Israel and China, are not signatories to the regime; and that there is no voluntary, international, verifiable regime to limit the spread of missile technology.

The bilaterally ratified 1987 INF Treaty between the U.S. and FSU had a significant impact on eliminating intermediate and short range missiles, and associated launchers, equipment, support facilities, and operating bases worldwide. It also banned flight testing and production of these missiles.

The Anti Ballistic Missile Treaty (ABM) signed in conjunction with SALT I in 1972 also between the U.S. and FSU is the only other treaty having a direct affect on ballistic missiles. ABM was based on the theory of mutually assured destruction (MAD) and had as an underlying premise that strategic

defensive systems promote the increased proliferation of strategic missile systems (SBM). This "unlimited duration" treaty does not restrict TMD but it fails to define the line between unrestricted theater defenses and restricted strategic defenses.<sup>62</sup> This has led to treaty compliance questions over TMD programs capable of intercepting lower end strategic weapons. The U.S. and Russia have begun negotiations in Geneva via the Standing Consultative Committee (SCC) to resolve these issues. A solution to this problem is critical to our near and long term TMD program.

Other arms control initiatives like the Nuclear Non-Proliferation Treaty (NPT), the Biological and Chemical Weapons Conventions (BWC and CWC), Conventional Force Reduction in Europe (CFE), nuclear-free zones, Confidence and Security Building Measures (CSBM), strengthen the norms against acquiring these weapons.

The U.N. Register of Conventional Arms, which promotes the voluntary reporting of all arms exports and imports to a UN based register since 30 April 1993, is also a highly effective initiative for increasing transparency.<sup>63</sup> This cooperative security agreement passed by a vote of 150-0 in December 1991, is a unique confidence building measure, that has great potential if the international community uses it. So far all indicators are positive.

Prevention also includes methods to defuse the threat through the application of cooperative destruction agreements,

inspection, conversion, and monitoring a select group of countries who already possess WMD; deterrence to convince even the most ardent proliferators that the risks of the threat of use of WMD are not acceptable.

b. Cooperative destruction agreements and defense conversion. These programs include our participation with Russia, Belarus, Ukraine, and Kazakhstan to implement their respective arms reduction commitments under the Strategic Arms Reduction Talks (START) I, and other arrangements they agreed to in the Lisbon Protocol. Additionally, we will also assist Russia in their implementation of START II obligations. This will hopefully result in the elimination of hundreds of strategic offensive arms and over 18,000 nuclear warheads.<sup>64</sup> The Nunn-Lugar Program will provide over \$420 million in US funds to assist the Russians, Belarus, Ukraine, and Kazakhstan in the safe and secure transportation, storage, and elimination of nuclear, chemical, and other WMD and the prevention of weapons proliferation.<sup>65</sup> Japan, with US encouragement, will provide \$100 million to assist in this cooperative threat reduction program. \$20 million in Nunn-Lugar funds will also be used to convert one or more Russian defense industrial facilities to producing prefabricated housing.<sup>66</sup>

These aforementioned measures constitute the major portions of our prevention program and remain our preeminent focus. However, as in the case of MTCR, we recognize that ballistic missile proliferation has not been eliminated. Therefore,

protection is a necessary and critical element of our counterproliferation policy.

2. Protection. For future regional contingencies, a major concern that emerged from the Gulf War was the political and military importance of possessing a defense capability to counter the threatened or actual use of ballistic missiles and WMD. U.S. protection strategy includes: 1) offensive capabilities prepared to protect U.S. forces and allied requests for assistance; and, 2) the development of active and passive defensive technologies that will mitigate the effects of WMD and enable U.S. forces to fight effectively even on a contaminated battlefield.<sup>67</sup>

a. Defense. The Gulf War provides several important lessons about the political and military value of theater missile defenses.

" . Ballistic missiles, even when armed only with conventional warheads, were not only effective terror weapons, but potentially effective military weapons. Therefore, protection of civilian population centers and other nonmilitary assets proved to be important.

Traditional notions of deterrence may not always apply in regional conflict situations. Instead of being deterred by the possibility of Israeli retaliation against Scud attacks, Saddam sought to provoke such a response, luring Israel into the conflict to change the political dynamics of the war. In this type of situation, the presence of defense can be decisive in avoiding escalation."<sup>68</sup>

The development of more reliable defensive capabilities will serve to significantly reduce ballistic missile proliferation. Effective missile defenses discount incentives for proliferators to develop, acquire, or use ballistic missiles and WMD. Eliminating the value of offensive missiles by destroying

attacking systems denies a belligerent their desired effect or goal. The ability to extend this protection to allies can have a significant affect on mitigating the perceived need to procure WMD and ballistic missiles.

In 1991, the U.S. congress enacted the Missile Defense Act, which directed the Secretary of Defense to develop and deploy advanced theater missile defense (TMD) systems, as well as national missile defense (NMD) systems . The Clinton administration further directed that TMD receive the highest priority. The BMDO has as its mission the requirement to develop early operational TMD capabilities to respond to existing and projected threats.<sup>69</sup> TMD is made up of individual elements such as ground and sea based radars, non-nuclear interceptors, and a command and control network. It will operate in concert with U.S. early warning and other intelligence systems to detect, track, and intercept TBMs. This will provide point and area wide defense and warning to U.S. forward-based forces. U.S. defenses, in combination with those our allies and coalition partners, will provide protection on short notice for U.S. and host nation forces, to include ports and airfields for arriving forces. These defenses will also protect population centers.<sup>70</sup>

Near term TMD initiatives will improve the PATRIOT anti-tactical ballistic missile (PAC-2), enhance tactical ballistic missile (TBM) surveillance and tracking (TPS-59 (Radar)/ HAWK Upgrade), and expand user availability of early warning information (BM/C<sup>3</sup> - DSP Data Dissemination).<sup>71</sup> Mid term TMD

improvements (FY97-2002) will focus on the development and fielding of the first wide area protection system (Theater High Altitude Area Defense Missile System (THAAD)), and improving lethality against TBMs with the PATRIOT PAC-3, which includes a hit-to-kill, extended range interceptor (ERINT) missile. Enhancing detection and intercept effectiveness (AEGIS/SM-2 Block IVA) is also a part of the mid term improvement package.<sup>72</sup> These programs will provide the capability to defend against TBMs in the decent phases of flight, i.e., below their flight apex.

Other advanced concepts to target missiles in the ascent and boost phases of flight are being considered for FY 2002+. Future technology programs include research on systems like the magnetic rail gun and hypersonic glide vehicle. The magnetic rail gun, used in conjunction with JSTARS, could have the capability of targeting and impacting a kinetic projectile in less than two minutes, while providing a line-of-sight kill capability in excess of 100 nautical miles. The hypersonic unmanned glide vehicle would have a similar capability, but with increased ranges out to 1000 miles in less than 15 minutes.<sup>73</sup> NMD systems are second priority and will be pursued as funds become available.

## VI. RECOMMENDATIONS

The priority placed by the National Command Authority on ballistic missile proliferation is on target. The comprehensive program described in the U.S. counterproliferation program

appears to strike the right balance between political/diplomatic measures and military capability. Developing defensive systems to counter the massive offensive threat posed by WMD and ballistic missiles may provide the catalyst needed to send missile proliferation into a decline. The following recommendations are categorized in accordance with the tenets of the U.S. counterproliferation program.

**A. Dissuasion.** Continued emphasis on the economic, political and military cost of proliferation, and U.S. policies encouraging the development of regional security alliances should remain a priority. Promoting regional openness, trust, and confidence are critical to reinforcing stability throughout the world. U.S. leadership in this area is an important factor to success. Developing states must be convinced that the cost of possessing ballistic missiles and WMD only hinders the development process, while increasing local tensions. The U.S. along with the other G-7 countries should join together to offer preferential economic and trading status to those nations who establish stringent regional arms restrictions. Positive and negative security assurances also continue to be effective in this area.

**B. Denial.** Export controls and interdiction programs which disrupt the supply of weapons and technologies are effective tools in the denial effort. They assist in reducing proliferation while driving the cost of these systems up. Multilateral control regimes must be promoted and shored up.



Although it appears that the MTCR represents only a delaying action, efforts to strengthen and reinforce this regime could provide the stimulus for greater participation and compliance. The Director of US Naval Intelligence, Admiral Thomas Brooks stated "that MTCR and the Non-Proliferation Treaty have been largely ineffective and are likely to remain so."<sup>74</sup> This attitude prevails in many circles, however, what is overlooked is that the absence of any controls would lead to greater instability, proliferation, and global volatility. Diplomatic efforts to coerce large supplier nations like Russia and China into becoming signatories to this convention would enhance the credibility of this effort. Making this regime legally binding could also add teeth to the program.

C. **Arms Control.** The Non-Proliferation Treaty (NPT), focused on halting the proliferation of nuclear weapons, has grown to include over 150 states including China, France, and Russia. This treaty received new momentum since the Gulf War with Zimbabwe, Zambia, Tanzania, and South Africa announcing their accession, and Angola and Mambia indicating their intention to accede.<sup>75</sup> The combination of instruments (MTCR, NPT, Confidence and Security Building Measures (CSBM), START, Conventional Force Reductions in Europe (CFE) - to name a few), are individually imperfect, but as a whole are considerably powerful and effective. Formal arms control agreements, material safeguard arrangements, and export controls, provide direct pressure and influence on nations to reduce proliferation. It is

important not to take this strategy for granted."

Aligning conventional reductions, similar to those generated by CFE, with WMD and ballistic missile arms control agreements in other regions of the world, could provide an incentive to reduce military arsenals everywhere. Regional alliances like the Association of Southeast Asian Nations (ASEAN), the Organization of American States (OAS), etc., could be used as forums to initiate discussion and action in this area.

Ultimately, democratic nations must continue their efforts to pressure others to accede to non-proliferation regimes.. Building confidence through verification and increased transparency can lead to the potential for an era of openness and trust. Without this and a sense of common interest in increasing the spirit of cooperation for lowering the threat of use of weapons of mass destruction there is no hope for the future of arms control.

**D. International Pressure.** The United States as the only remaining super power, must continue to take the lead in responsible stewardship of nuclear arsenals, reduction of ballistic missile proliferation, increasing cooperation and openness, and furthering arms control initiatives multilaterally and unilaterally. Strengthening U.N. involvement, as a key medium for non-proliferation activities in this process, is also critical. Instituting another committee similar to the previous Co-ordinating Committee for Multilateral Export Controls (COCOM) could aid in stemming technology transfer control problems.

Through the use of international organizations more stringent controls, verification regimes and sanctions can be instituted. These groups can also be an effective forum for developing internationally accepted norms to discourage non-compliance with ballistic missile and WMD reduction initiatives.

**E. Defusing.** Cooperative destruction agreements and defense conversion initiatives like those promoted by the Nunn-Lugar program provided incentive for participation in defusing initiatives. More financial burden sharing is needed on the part of the world community to enhance this effort. The U.S. should take the lead in promoting a program to formalize participation in this effort. Again using forums like the G-7 and the U.N. to organize these ventures can simplify this process.

**F. Deterrence.** A lobbying effort on the part of the permanent members of the U.N. security council that collectively condemns the use of WMD by all nations can serve to dissuade any Third World nation from using WMDs. *No WMD exchange* should be the goal and world wide deterrence is the key. This is a critical element of the current program, that possibly could evolve into the total elimination of WMD. Another option would be for the permanent members of the U.N. Security Council (at a minimum) to ban together to offer positive security guarantees to nations who chose to be WMD free. This obviously would have to be tied into a formal arms control agreement.

**G. Offensive Capabilities.** All nations must have a clear understanding of U.S. resolve to protect its citizens and allies

if threatened. This mandates that we maintain the conventional technological edge that we currently enjoy. This is and important part of our credibility as a world leader, and can provide the emphasis needed to sustain national stability .

**H. Defensive Capabilities.** This is an essential element of our current counterproliferation program. The development and deployment of TMD in the short term and NMD in the future can form the cornerstone of stability throughout the world. If all nations had no fear of catastrophic destruction at the hand of WMDs, and adversary nations realized that they could be harmed by their own WMDs, I firmly believe that the utility of such weapons would be lost. Research and development funds must be prioritized to support this effort. Once these systems are fielded, the proliferation spiral should be broken.

Multilateral cooperative development ventures should also be promoted to reduce cost and speed up operational capability. French and Russian cooperation on the potential adaptation of the Russian SA-12 for use as a European anti-ballistic missile defense system is a good example of this.<sup>77</sup> Consideration for U.S. adaptation of the Russian anti-tactical ballistic missile (ATBM) S-300V, which has a 90km intercept capability, could also be cost effective and lead to future bilateral defense development opportunities.

Until biological and chemical weapons are no longer a threat, passive measure to improve U.S. capability to operate in a contaminated environment must also be a priority.

## VII. CONCLUSION

As the sole remaining super power, the U.S. must accede to its leadership role, in the world community, in reducing the proliferation of ballistic missiles and WMD. The network that merges the aforementioned efforts into a coherent world strategy will help to eliminate the demand and supply for WMD, and also reduce the need for the ballistic missiles that deliver them. Global stability can be enhanced if the world community were to agree on a comprehensive nonproliferation agreement based on openness, transparency, and fairness. This agreement must include a rigidly enforced and verifiable regime to be effective. U.S. counterproliferation efforts can lead to a world focused on "mutually assured protection" rather than "mutually assured destruction". Developing nations must be assured that disarmament is the key to national and economic security. Only a world body, with the U.S. as its leader, has the current capacity to provide these security guarantees. Ballistic missile proliferation can be abated and ultimately eliminated in the 21st century if we take aggressive action now to address these problems.

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# WORLD BALLISTIC MISSILE INVENTORY - 1994

Nation	Weapon System	Maximum Range (km)	Maximum Payload (km)	In Service (IS) In Development (ID) Terminated (T) * Cruise Missile
Afghanistan	SS-1, ScudB(R-17)	300	985	IS
Algeria	SS-1, ScudB(R-17)	300	985	IS
	Frog-7	70 ?		IS
Argentina	Alacran	200	500	ID
	Condor 1	300	985	IS
	Condor 2	900	500	T
Azerbaijan	SS-1, ScudB(R-17)	300	985	IS
Belarus	SS21, Scarab(OTR21)	70	480	IS
	SS-1, ScudB(R-17)	300	985	IS
	AS4, Kitchen(KH-22)	400	1000	IS*
	AS6, Kingfish(KSR-5)	400	1000	IS*
Belgium	MGM52, Lance	130	450	IS
Brazil	Sonda III	50 ?		IS
	SM-70 Barracuda	70 ?		ID
	MB/EE 150	150	500	ID
	SS300	300	1000	ID
	MB/EE 350	350	500	ID
	Sonda IV	370 ?		IS
	SS800	600	500	ID
	SS1000	740 ?		IS
	SM70 Barracuda	? ?		ID*
Bulgaria	SS-1, ScudB(R-17)	300	985	IS
China	HY-1/FL-1/YJ-1	40 ?		IS
	HY-2	80 ?		IS
	CSS-8	150 ?		IS
	B610 (M7)	180	500	ID
	M11 (DF-11)	300	500	ID
	ScudB	300	985	IS
	ScudC	500 ?		IS
	M9 (DF-15)	600	500	ID
	Unknown	600 ?		ID*
	DF2	900 ?		IS
	M18 (Tondar-68)	1000	400	ID
	CSS-N-3(JL-1)(SLBM)	1700	600	IS
	DF-25	1700	2000	ID
	CSS-5 (DF-21)	1800	600	IS
	JL-1(SLBM)	2050 ?		IS
	CSS-2 (DF-3A)	2500	2150	IS
	CSS-3 (DF-4)	4750	2200	IS
	DF-31	8000 ?		ID
	JL-2(SLBM)	8000 ?		ID
	CSS-4 (DF-5)	11000 ?		IS
	DF-41	12000 ?		ID
	XW-41, YJ-2, CK-1, Hy-4, C-101, HY-3	? ?		ID*
Cuba	Frog-4	40 ?		IS
	Frog-7	70 ?		IS
Czechoslovakia	SS21, Scarab(OTR21)	70	480	IS
	SS-1, ScudB(R-17)	300	985	IS
Egypt	Frog-5	50 ?		IS
	Frog-7	70 ?		IS
	Sakr 80	80 ?		IS
	SS-1, ScudB(R-17)	300	985	IS
	Improved ScudB	370 ?		ID
	Project T	450	985	ID
	Condor 2	600	500	T
	Vector	600	450	ID

NOTE: All data obtained from unclassified sources Page1

Enclosure 1

# WORLD BALLISTIC MISSILE INVENTORY - 1994

Nation	Weapon System	Maximum Range (km)	Maximum Payload (km)	In Service (IS) In Development (ID) Terminated (T) * Cruise Missile
	Badr 2000	1200	450	T
France	MM 39 Exocet/AM 39	40 ?		IS*
	MM 40 Exocet	70 ?		IS*
	AS-37	55 ?		IS
	Armat	90 ?		IS
	Pluton	120	400	IS
	Hades	480	400	IS
	S-3	3000	1000	IS
	S-4	3500	900	T
	M-4 (SLBM)	4000	1000	IS
	M-45 (SLBM)	4000	1000	ID
	M-5 (SLBM)	11000 ?		ID
	ASMP, ASLP, Apache, C-22, ANS, Otmat	?	?	ID*
Georgia	SS-1, ScudB(R-17)	300	985	IS
Germany	MGM-52 Lance	130	450	IS
	AS 34 Kormoran, ANS, MW1	?	?	ID*
Hungary	SS21, Scarab(OTR21)	70	480	IS
	SS-1, ScudB(R-17)	300	985	IS
India	Rohini	130	400	ID
	Prithvi 150	150	1000	ID
	Prithvi 250	250	500	ID
	?	800 ?		ID
	Agni	2500	1000	ID
	Asiv	4000	500	ID
Iran	OGHAB	25 ?		IS
	Shahin 2	40 ?		IS
	Frog-5	50 ?		IS
	Nazeat	70 ?		IS
	Iran 130 (Mushak 120)	130	500	IS
	CSS-8	150 ?		IS
	CSS-8	150 ?		IS
	Mushak 200	200	500	ID
	SS-1, ScudB(R-17)	300	985	IS
	Scud Improvement	550	500	IS
	Labour-1 (No-dong 1)	1000	1000	ID
	M18 (Tondar-68)	1000	400	ID
Iraq	Frog-7	70 ?		IS
	FAW 70	80 ?		IS
	FAW 150	150 ?		IS
	FAW 200	200 ?		IS
	CSS-8	150 ?		IS
	Ababeel	500 ?		ID
	SS-1, ScudB(R-17)	300	985	IS
	Al Hussein	650	500	IS
	Al Abbas	900	300	ID
	Condor 2	900	500	T
	No-dong 1	1000	1000	ID
	Badr 2000	1200	450	T
	Al Aabad	2000	750	T
	Abail, Faw 200	?	?	ID*
Israel	Gabriel Mk1	20 ?		IS
	Gabriel Mk2/3	35 ?		IS
	MGM-52 Lance	130	450	IS
	Jericho (YA-1)	500	500	IS
	Shavit	930 ?		IS
	Jericho (YA-3)	1500	1000	IS

NOTE: All data obtained from unclassified sources Page2

Enclosure 1

# WORLD BALLISTIC MISSILE INVENTORY - 1994

Nation	Weapon System	Maximum Range (km)	Maximum Payload (km)	In Service (IS) In Development (ID) Terminated (T) * Cruise Missile
	Gabriel 4	?	?	ID*
Italy	MGM-52 Lance	130	450	IS
	Otomat Mk1	60	?	IS
	Otomat Mk2	180	?	IS
	Skyshark, Mirach 300, Otomat	?	?	ID*
Japan	SSM-1, ASM-2	150	?	ID*
Kazakhstan	SS-21, Scarab (OTR-21)	70	480	IS
	SS-1, Scud B (R-17)	300	985	IS
	AS-4, Kitchen (KH-22)	400	1000	IS*
	SS-18 Satan (RS-20)	11000	?	IS
Kuwait	Frog-7	70	?	IS
Libya	SS-21, Scarab (OTR-21)	70	480	IS
	SS-1, Scud B (R-17)	300	985	IS
	Al Fatah	950	500	ID
	No-dong 1	1000	1000	ID
Netherlands	MGM-52 Lance	130	450	IS
North Korea	Frog-5	50	?	IS
	Frog-7	70	?	IS
	SS-1, Scud B (R-17)	300	985	IS
	Scud B Improvement	550	500	IS
	No-dong 1	1000	1000	ID
	Taepo-dong 1	2000	1000	ID
	Taepo-dong 2	3500	1000	ID
	HY-2	?	?	ID*
	No-dong 2	?	?	ID
Pakistan	HATF1	80	500	ID
	HATF1A	100	500	ID
	HATF2	300	500	ID
	HATF3	600	500	ID
Poland	SS-21, Scarab (OTR-21)	70	480	IS
Russia	SS-21, Scarab (OTR-21)	70	480	IS
	SS-1, Scud B (R-17)	300	985	IS
	AS-4, Kitchen (KH-22)	400	1000	IS*
	AS-8, Kingfish (KSR-5)	400	1000	IS*
	SS-N-3 Shaddock/Sepal 450	450	1000	IS*
	SS-N-12 Sandbox	550	1000	IS*
	SS-N-19 Shipwreck	550	750	IS*
	CCM	600	410	IS*
	AS-3 Kangaroo (KH-20)	650	1000	IS*
	AS-15 Kent (KH-55)	3000	300	IS*
	AS-19 Koala	3000	?	T
	SS-N-21 Sampson	3000	300	IS*
	SS-N-6 SERB (SLBM)	3000	650	IS
	SS-NX-24 Scorpion	4000	?	T
	SS-NX-24 Scorpion	4000	?	T
	SS-N-18 Stingray (SLBM)	5,500	?	IS
	SS-N-Sawfly (SLBM)	7800	?	IS
	SS-N-20 Sturgeon	8300	?	IS
	SS-N-23 Skiff (SLBM)	8300	?	IS
	SS-13 Savage (RS-12)	9400	?	IS
	SS-17 Sparker (RS-16)	10000	?	IS
	SS-19 Stiletto (RS-18)	10000	?	IS
	SS-24 Scalpel (RS-22)	10,000	?	IS
	SS-25 Sickle (RS-12M)	10500	?	IS
	SS-11 Sego (RS-10)	13000	?	IS
	N-22	?	?	ID*

NOTE: All data obtained from unclassified sources Page3

Enclosure 1

# WORLD BALLISTIC MISSILE INVENTORY - 1994

Nation	Weapon System	Maximum Range (km)	Maximum Payload (km)	In Service (IS) In Development (ID) Terminated (T) * Cruise Missile
	SS-NX-26(SLBM)	?	?	ID
	SS-NX-27(SLBM)	?	?	ID
	SS-X-26	?	?	ID
Saudi Arabia	DF-3A	2800	2150	IS
Slovakia	SS21, Scarab(OTR21)	70	480	IS
South Africa	Skorpioen	35	?	ID
	Jericho 2	1000	15000	IS
	Armiston	1500	1000	ID
South Korea	Honest John	30	?	IS
	KSSM	250	?	IS
	NHK-1	250	300	IS
Spain	Capricornio	1300	500	ID
Sweden	RBS15, ASOM	?	?	ID*
Syria	Frog-7	70	?	IS
	SS21, Scarab(OTR21)	70	480	IS
	SS-1, ScudB(R-17)	300	985	IS
	SS-N-3 Shaddock/Sepal450	450	1000	IS*
	Scud B Improvement	550	500	IS
	M-9	600	?	IS
Taiwan	Ching Feng (Green Bee)	130	400	IS
	Tien-Ma (Sky Horse)	950	500	ID
	Hsiung Feng 2	80	?	ID*
Ukraine	SS-21, Scarab(OTR21)	70	480	IS
	SS-1, ScudB(R-17)	300	985	IS
	AS4, Kitchen(KH-22)	400	1000	IS*
	AS6, Kingfish(KSR-5)	400	1000	IS*
	SS-N-3 Shaddock/Sepal450	450	1000	IS*
	SS-N-12 Sandbox	550	1000	IS*
	SS-N-19 Shipwreck	550	750	IS*
	SS-19 Stiletto(RS-18)	10,000	?	IS
	SS-24 Scalpel(RS-22)	10,000	?	IS
United Kingdom	Alarm	45	?	IS
	Sea Eagle	110	?	IS
	MGM-52 Lance	130	450	IS
	A-3TK Polaris(SLBM)	4630	1500	IS
	UGM-133 Trident D5(SLBM)	12,500	?	IS
	Sea Eagle, Mantis	?	?	ID*
United States	MGM-52 Lance	130	450	IS
	ATACMS	135	450	IS
	AGM-131 SRAM2	400	265	T
	AGM/MGM-137	450	450	ID*
	BGM-109 Tomahawk	2500	450	IS*
	AGM-129 ACM	3000	450	IS*
	UGM-73 Poseidon(SLBM)	4830	2000	IS
	UGM-96 Trident C4(SLBM)	7400	?	IS
	LGM-118 Peacekeeper MX	9000	?	IS
	XMGM-134 Small ICBM	11000	?	IS
	LGM-30F Minuteman 2	12,500	?	IS
	UGM-133 Trident D5(SLBM)	12500	?	IS
	LGM-30G Minuteman 3	13,000	?	IS
	RGM-84 Harpoon, MQM-107, BQM-126, AQM-107, BQM-126, AQM-127, TBA324, AGM-136 Tacit Rainbow, BQM145	?	?	ID*
Vietnam	SS-1, ScudB(R-17)	300	985	IS
Yemen	Frog-7	70	?	IS

NOTE: All data obtained from unclassified sources Page 4

Enclosure 1

## WORLD BALLISTIC MISSILE INVENTORY - 1994

Nation	Weapon System	Maximum Range (km)	Maximum Payload (km)	In Service (IS)
				In Development (ID) Terminated (T) * Cruise Missile
	SS-21, Scarab (OTR 21)	70	480	IS
	SS-1, Scud B (R-17)	300	985	IS

<b>DECLARED NUCLEAR-WEAPON STATES</b>		
<b>KEY:</b> > 100 Miles or more < Less than 100 miles + Yes * Probably		
<b>NATION</b>	<b>Ballistic missiles</b> (longest known range in miles)	<b>Chemical or biological</b>
Britain*	> 2,900	
China*	> 9,300	*
France*	> 3,100	*
Russia*	> 8,100	+
Belarus~	> 6,500	+
Kazakhstan~	> 6,800	+
Ukraine~	> 6,200	+
U.S.*	> 9,200	+
<b>UNDECLARED NUCLEAR-WEAPON STATES</b>		
India	> 1,550	*
Israel*	> 930	*
Pakistan	> 190	*
<b>WORKING ON OBTAINING NUCLEAR WEAPONS</b>		
Algeria	< 40	
Iran	> 300	*
Iraq	> 190	+
Libya	> 190	*
North Korea	> 300	*
Syria	> 300	*
<b>CEASED DEVELOPING NUCLEAR WEAPONS</b>		
Argentina	< 60	*
Brazil	> 190	
South Africa	> 930	*
South Korea	> 160	*
Taiwan	< 40	*
*Capable of delivering weapons -committed to becoming nonnuclear but currently possessing nuclear weapons under Russian control stationed in their territory.		

Source: Bruce W. Nelan, "Fighting Off Dooms," *Time*, 21 June 1993 p. 38.

Enclosure 2



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