

# THE DEFENSE MONITOR

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## THE F-22

### *Not What We Were Hoping For*



*Pierre M. Sprey and James P. Stevenson, Straus Military Reform Project Advisers*

For decades, the U.S. Air Force has promoted the F-22 as its fighter for the 21st century. Advocates tout its technical features: fuel efficient, high speed “super-cruise,” advanced electronics, and reduced profile against enemy sensors, known as “stealth.” While those are popular amenities, the measures that really determine winning or losing in air combat have been overlooked by the Air Force. The F-22 fails to improve America’s fighter force and degrades our combat capability.

There are five attributes that make a winning fighter; they are backed up by 90 years of air combat history; they are:

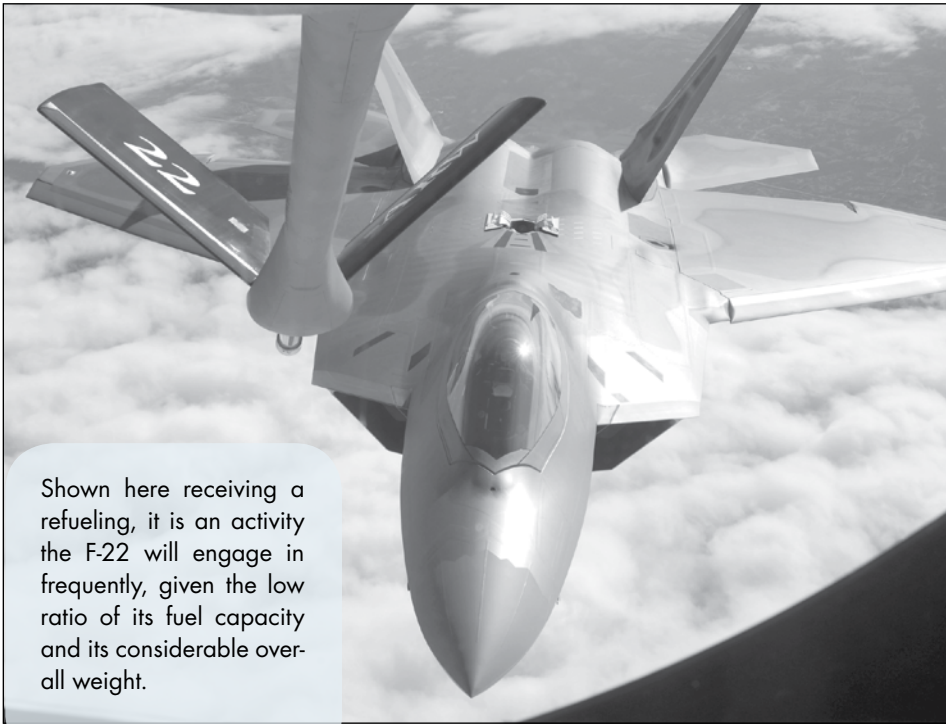
1. pilot training and ability;
2. obtaining the first sighting and surprising the enemy;
3. out-numbering enemy fighters in the air;
4. out-maneuvering enemy fighters to gain a firing position; and
5. consistently converting split-second firing opportunities into kills.

Compared to the F-15 and the F-16, the F-22 does not measure up to these central abilities.

In combat, the F-22 will most frequently be found on the ground, as shown here, due to its extremely high maintenance requirements.

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Shown here receiving a refueling, it is an activity the F-22 will engage in frequently, given the low ratio of its fuel capacity and its considerable overall weight.

The F-22 is a mediocrity, at best, on requisites four and five, but it is a liability on points one, two and three.

The first attribute is the most important – pilot training and ability. Great pilots get to be great by constant dogfight training.

Between 1975 and 1980, at the Navy Fighter Weapons School (Topgun), instructor pilots logged 40 to 60 hours of air combat maneuvering per month. Flying the cheap, simple F-5, the robustly trained instructors consistently whipped their students who flew the “more capable” F-4 Phantoms, F-14 Tomcats, and F-15 Eagles. Today, partly thanks to the pressure on the Air Force’s training budget from the F-22’s excessive costs, an F-22 pilot gets only 12 to 14 hours of flight training per month. For winning future air battles, this is a huge step backward.

The aircraft’s stealth ability only contributes to the inability of the F-22 to meet standards two and three. The F-22’s stealth requirement adds significant drag, weight and size. Size

is the most damaging to the aircraft’s ability. The F-22 is much bigger than most fighters, thus it will be detected first by the sensor most likely to be the determinative one – eyeballs – completely reversing the theoretical advantage of “stealth.” Topgun had a saying, “the biggest target in the sky is always the first to die.” And once a F-22 is seen, it will have trouble outmaneuvering the enemy because its weight hurts its ability to turn and accelerate. Notably, both the F-15A and F-16A out-turn and out-accelerate the F-22.

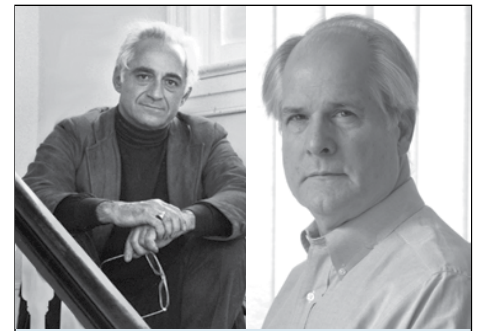
The most obvious disadvantage stealth brings – and why the aircraft fails attribute three – is the F-22s extraordinary cost; it grossly reduces the numbers the United States will buy. New Defense Department data shows the total program unit cost of the F-22 has grown from about \$130 million to over \$350 million per aircraft. The result? The original request to buy 750 F-22s is now down to 185, thus the chances of outnumbering enemy aircraft are slim.

The Air Force will argue strenu-

ously that we are wrong and the F-22 has excelled in air-to-air exercises against all comers. However, our information is that these are “canned” engagements in which the F-22 is put in scenarios set up to exploit the F-22’s theoretical advantages and exclude its real world vulnerabilities.

But there is a way to find out who is right: Conduct an unscripted test of F-22 capabilities by pitting it against pilots and aircraft that the tiny F-22 inventory expects to meet in hostile skies.

We both would be delighted to observe any such realistic exercises. Nothing would please us more than to find that we are wrong and American fighter pilots have been given the best fighter in the sky. ■



Pierre Sprey and James Stevenson

Pierre Sprey was one of three designers who conceived and shaped the F-16; he also led the technical side of the U.S. Air Force’s A-10 design concept team. James Stevenson is former editor of the Navy Fighter Weapons School’s *Topgun Journal* and author of *The Pentagon Paradox* and *The \$5 Billion Misunderstanding*.

This article was first published in *Jane’s Defense Weekly* ([jdw.janes.com](http://jdw.janes.com)) on Sept. 20, 2006, and is adapted from a briefing they produced for the Straus Military Reform Project of the Center for Defense Information.

## Emerging Nuclear Weapons Policies

### *An Opportunity to Increase Dialogue*

Victoria Samson, *CDI Research Analyst*

The World Security Institute hosted a conference on the future of U.S. and other countries' nuclear arsenals. "Emerging Nuclear Weapons Policies: An Opportunity to Increase Dialogue," held Oct. 12-13, 2006, allowed for a free and honest discussion about the state of U.S. nuclear weapons programs and ways in which it could proceed in the future.

Among the conference's nearly 40 participants were representatives from the Department of Energy's National Nuclear Security Administration and former heads of the laboratories in charge of the U.S. nuclear arsenal.

Presentations took a broad look at the major issues facing U.S. and other nuclear powers' programs. Participants discussed new and traditional security threats to Russia and the

United States; perspectives on new arrangements for nuclear weapons and missile defense; U.S. concepts for nuclear weapons modernization; reform of military nuclear industries in the United States; challenges of nuclear proliferation, nuclear terrorism, and the maintenance of arsenals in major nuclear powers in the absence of nuclear testing.

Particularly controversial were discussions on what exactly the United States intends to do with its proposed Reliable Replacement Warhead (RRW) program. While the program is ostensibly being promoted as a way to ensure the dependability of the U.S. nuclear arsenal, there are many experts who fear that it may lead to a whole new series of nuclear weapons and even prompt the return by the United States to nuclear testing – something which hasn't happened since 1992.

Along those lines, many of the participants were concerned about how the nuclear laboratories should respond to the challenge of keeping their work forces interested and fully engaged despite the lack of nuclear testing.

Much of the debate also centered on North Korea's nuclear test, held just three days prior to the conference. North Korea's likely entry to the nuclear club raised concerns that U.S. policy is on the wrong path and prompted debate on what this means for international accords that attempt to prevent nuclear proliferation.

The keynote speaker was Thomas Graham, special assistant to President George W. Bush and senior director for Russian Affairs at the National Security Council. His speech focused on U.S.-Russian relations. While admitting that they had seen better times, he optimistically predicted that there were many ways for future cooperative efforts to prevent the further spread of nuclear materials.

Overall, it was a captivating discussion between some of the top minds shaping the U.S. nuclear weapons complex. It even included some Russian and Chinese observers who were able to add their views to the dialogue. Many of the presentations are posted on CDI's website with the hopes of sharing the expertise that was brought to the table and continuing the discussion. ■

## Improving Global Space Situational Awareness

### *A Successful Conference Co-Sponsored by CDI*

Theresa Hitchens, *CDI Director*

CDI's Space Security Project and the U.S. Air Force Academy's Center for Space and Defense co-sponsored a conference, "Improving Our Vision: Approaches for Shared Space Situational Awareness" in Colorado Springs, Colo., on Sept. 15-16,

2006. The purpose of the conference was to bring together the full range of stakeholders interested in space situational awareness – from practitioners to users of data, representatives of industry, the military, the scientific community, international organizations, and the amateur satellite-tracking community – to discuss how needs are changing, what improvements in capabilities can be achieved in the near- to mid-term future, and how various stakeholder communities might better interact to draw on each other's strengths.

With speakers ranging from Air Force Space Command officials to

NASA scientists to senior executives of commercial satellite operators, the conference was rated by all as highly successful at outlining both the challenges and opportunities for improving global understanding of the risks from space debris, potential on-orbit collisions or, perhaps in the future, deliberate threats to satellites. Indeed, CDI is being urged by participants to hold a follow-up conference next year. You can access the agenda of the conference and the various presentations at [www.cdi.org](http://www.cdi.org) under Space Security. A conference report is forthcoming. ■

# A Farewell to Arms Control?

## Changing Course on Nuclear Talks

*A version of this commentary was originally published in The Sacramento Bee on Oct. 22, 2006.*

**N**orth Korea's detonation of a nuclear bomb at the beginning of October, now confirmed by seismic and radioactive air sample measurements, has many Americans wondering if other countries will embark on a nuclear arms race. And many people are asking, **"Whatever happened to arms control?"**

Conservative politicians in Japan have started calling for the country to arm itself with nuclear weapons, which Japan has resisted since World War II. Japanese citizens remember the death and destruction from atomic bombs that fell on Hiroshima and Nagasaki and have vowed to keep Japan free from nuclear weapons. But with neighboring North Korea rattling its nuclear sword, will Japanese conservatives gain the political leverage they need to change this long-standing policy?

If Japan develops nuclear weapons, will South Korea, which has relied greatly upon the United States for its defense, go nuclear? Such a chain reaction could extend to Taiwan, further exacerbating tensions with China.

A nuclear arms race in Asia is the last thing the world needs, and the United States has an opportunity to demonstrate new leadership in arms control that could change the course of nuclear proliferation. However, perhaps due to the war in Iraq and the preoccupation with terrorism, the United States has not devoted the kind of effort it did in the past to arms control.

As Max Kampelman, President Ronald Reagan's chief arms control negotiator, recently put it, "Unfortunately, the goal of globally eliminating all weapons of mass destruction – nuclear, chemical and biological arms – is today not an integral part of American foreign policy; it needs to be put back at the top of our agenda."

To complicate matters further, the United States has been pursuing new nuclear weapons initiatives and funding a program that may resume nuclear testing in 18 months, to address future concerns over the dependability of the U.S. nuclear weapons stockpile. If the United States decides to resume nuclear testing, it would violate the Comprehensive Nuclear Test Ban Treaty signed in New York a decade ago but still not ratified by the U.S. Congress.

The new nuclear weapons initiatives have included the development of new "Reliable Replacement Warheads" that provide better performance for the existing U.S. nuclear stockpile, revitalizing the U.S. nuclear weapons manufacturing complex and a program to develop a new nuclear earth-penetrating weapon to attack underground enemy facilities.

While there are legitimate arguments for each of these programs, in the absence of balancing a high-level effort toward arms control by the United States, these initiatives can be viewed by other nations as dangerous and provocative.

One of the foremost experts on nuclear weapons in Congress, Rep. David Hobson, R-Ohio, summarized the situation in remarks to the U.S. National Academy of Sciences two years ago. "I view the Advanced (nuclear weapons) Concepts research proposal, the Robust Nuclear Earth Penetrator study, and the effort to reduce the nuclear test readiness posture to 18 months as very provocative and overly aggressive policies that undermine our moral authority to argue that other nations should forgo nuclear weapons. We cannot advocate for nuclear nonproliferation around the globe and pursue more usable nuclear weapon options here at home. That inconsistency is not lost on anyone in the international community."

In effect, the United States is saying to North Korea and Iran, "Do as I say, not as I do." This doesn't wash with countries that feel threatened by the United States, especially when the United States is not taking a more active role in arms control. Increasingly, the special rights and privileges accorded to the five original nuclear weapons states – the United States, Russia, China, France and the United Kingdom – by the nuclear Non-Proliferation Treaty are being challenged

by other states. These same five nuclear weapons states are also the five permanent members of the UN Security Council, each of which has veto power over any UN resolution. Thus, by failing to lead in arms control, the United States is jeopardizing its role in the international community and in the United Nations.

In June, Russian President Vladimir Putin called for “renewed dialogue on the main disarmament issues,” and proposed talks with the United States on renewing or replacing the Strategic Arms Reduction Treaty, START-1, which is set to expire in 2009. Initially proposed by Reagan, and finally signed by the United States and the Soviet Union in 1991, the treaty limits each side to 1,600 delivery systems – intercontinental ballistic missiles, submarine launched ballistic missiles and bombers – and 6,000 nuclear warheads.

Considering the upcoming U.S. presidential elections in 2008, Putin’s call deserves a vigorous U.S. response. It will be unlikely that START-1 can be extended or renegotiated before it expires if we wait until after the 2008 presidential elections, no matter who wins. The first year of every U.S. presidency is consumed with filling cabinet positions, new federal budget formulations and reorganization. Considering how long arms control agreements can take to be renegotiated, if START-1 is to be saved, we must begin now.

However, the tepid U.S. response so far tells Russia that we don’t see START-1 as an urgent matter.

More is at stake than simply the future of START-1. The United States, Russia and China enjoy positions of authority in the international community and in the UN Security Council, which can be squandered if the three countries do not continue to show leadership in arms control.

In 2002, Russia and the United

States reached agreement on the Strategic Offensive Reductions Treaty, better known as the Moscow Treaty. This agreement achieves important and significant reductions in nuclear weapons, at least on paper. But there are no verification provisions in this treaty, the reductions are not required to be permanent – warheads may be placed in storage and later redeployed – and the reductions are required to be completed only by the time the treaty expires on Dec. 31, 2012, and can be reversed the very next day. While the Moscow Treaty is perhaps better than nothing, it is not in itself enough to sustain America’s traditional role of leadership in arms control.

Nuclear weapons, which were a source of strength to the United States in World War II, and one of deterrence for the world’s major powers during the Cold War, are becoming the trademark of smaller and weaker states that claim to be threatened, such as North Korea and Iran.

It is not necessary that countries must have nuclear weapons, and many countries have willingly given up their nuclear weapons programs. For example, Argentina, Brazil, the Ukraine, Belarus, Kazakhstan, South Africa (which reportedly had six nuclear weapons), Iraq (after the 1991 Gulf War and UN actions) and Libya

in 2003 (thanks to effective European diplomacy) all gave up active or contemplated nuclear weapons development programs.

But for other countries, such as Iran or North Korea to give up their nuclear programs, the United States must do more than call for sanctions; it must also be visible as an honest broker for arms control. How the United States, Russia and China behave with respect to their own nuclear policies will be key in joint efforts to achieve arms reductions worldwide.

The United States faces an analogous situation in the Middle East. The United States has lost its role as an honest broker between Islam and Judaism. The United States was credible in 1947 at the time of the United Nations’ Partition Plan when Israel was formed, and in 1978 at the Camp David Accords, and still later in 1993 with the Oslo Peace Accords. Today, however, the United States is the focus of the debate between Islam and the West, and no longer has the standing for effective arms-length diplomacy.

To control nuclear weapons, and the nuclear materials from which they can be made, requires strong international leadership and consistent actions. By failing to stop or slow the spread of nuclear weapons in Asia, we could compound the already murky situation in the Middle East. Real arms control must be put back at the top of the agenda.

Because of the poor esteem in which the United States is held in many parts of the world today, the United States must work with Russia and China to change the landscape of arms control. A strong effort by the United States to renew the START-1 agreement is a way to begin. Such efforts cannot only serve to reduce the threat from nuclear weapons, but also restore America’s image as a country committed to peace. ■

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*“The United States must do more than call for sanctions; it must also be visible as an honest broker for arms control.”*

# ANNOUNCEMENTS

events • news • projects

Since the Center for Defense Information reorganized in 2005 to form the World Security Institute (WSI), it has undertaken a variety of new projects. While CDI remains a core research division within our new organization, we've been updating our websites and expanding our presence abroad to reflect our new name. Below are a few updates on some of the most recent happenings throughout the Institute.

## WORLD SECURITY INSTITUTE LAUNCHES NEW WEBSITE

The World Security Institute debuted its new and improved website in November. The website is now available at [www.worldsecurityinstitute.org](http://www.worldsecurityinstitute.org). Explore and keep up to date with our various projects in our new dynamic, interactive and user-friendly environment. Your feedback is also greatly appreciated.

E-mail us at [wparker@worldsecurityinstitute.org](mailto:wparker@worldsecurityinstitute.org) and tell us what you think about our new look!

In the middle section of the website you will see a feature from each of WSI's five divisions (including the Center for Defense Information). Depending upon current events and the work of our staff, the featured division at the top of the page will change accordingly.

On our new site we have made searching for events more accessible by adding a calendar feature. In addition, we have developed a system that will allow relevant news, events, scholars, and publications to be displayed together when searching for our work by your region or topic of interest.

The site was built by our in-house web master, Mohamed Elkafoury, who has spent many long hours modifying the site to fit our specific needs at WSI.

## THREE FELLOWS FROM SOUTH CAUCASUS REGION JOIN WSI STAFF FOR COLLABORATIVE PROJECT

The arrival of the three fellows (from Armenia, Azerbaijan and Georgia) on Sept. 24 inaugurated the Caucasus



## INTERNSHIPS OFFER REWARDING EXPERIENCES FOR STUDENTS OF POLITICAL AFFAIRS

The Center for Defense Information, along with other divisions in the World Security Institute, hosts about 10 interns each semester. Our past interns have often noted that our organization provided them with valuable, enlightening experiences. We often give them great latitude to pursue their research interests, and to attend the dozens of lectures, workshops, and congressional hearings taking place each week in Washington, D.C.

"Interning for CDI's terrorism project has been a rewarding experience; access to world-renowned experts, flexibility to pursue my specific topics of interest and a great working environment were hallmarks of the program," said fall intern Tom Keller.

Our fall 2006 interns are pictured here, from left to right: Jane Byun, IT support; Matt Clary, China Program; Andrea Noble, assistant to the Farsi publication, *Washington Prism*; Ana Marte, CDI's Straus Military Reform Project; Tom Keller, CDI's Terrorism Project; Tim Murphy, CDI's Missile Defense and Space Security Projects; and Jacob Parakilas, communications assistant. Not pictured: Alexandra Verville, our production intern for *Foreign Exchange with Fareed Zakaria*; Valentina Pasquali, assistant to *Washington Prism*; and Akmal Nasimov, an assistant for the Russian publication *Washington ProFile*.

For more information about internship opportunities, visit [www.cdi.org/about/internships.cfm](http://www.cdi.org/about/internships.cfm).

fellows program, a core component of the WSI Caucasus Project, headed by Lilit Petrosyan. Its purpose is to bring three promising young scholars from the South Caucasus region to undertake collaborative research for a six month period. Its ultimate objective is to develop avenues of dialogue, strengthen existing channels of communication and create new networks between future decision-makers in the region.

Our three fellows include Gevorg Melikyan of Armenia, Aytan Gahramanova of Azerbaijan, and George Mchedlishvili of Georgia. During their first month with the project the fellows finalized the concept of their research project, which will now concentrate on the integration perspectives in the South Caucasus. The research will consist of a comparative analysis of existing regional political and economic institutions (EU, GUAM, CIS, etc.), seeking to find a system most compatible with the political, economic and cultural specificities of the South Caucasus, which may serve as an integration model.

A new on-line journal produced in association with the project, *Caucasus Context*, will be available starting in 2007. The first issue will focus on the region's Nagorno Karabakh conflict and will be prepared in conjunction with WSI's Pulitzer Center on Conflict Reporting.

### **WSI OPENS NEW MIDDLE EAST OFFICE IN CAIRO**

WSI has recently expanded its presence in the Middle East by opening a regional office in Cairo. The office will be headed by the editor in chief of WSI's Arabic publication, *Taqrir Washington*. Mohamed Elmenshawy, a native of Cairo, will help bring Middle East perspectives to U.S. policymakers, the American public, academic institutions and the inter-

national community through various publications and media projects.

### **WSI'S PULITZER CENTER ON CRISIS REPORTING LAUNCHES WEBSITE**

The World Security Institute's Pulitzer Center on Crisis Reporting, established in early 2006, intends to be a leader in sponsoring the independent reporting that media organizations are increasingly less willing to undertake on their own. The Center's goal is to raise the standard of coverage of global affairs, and to do so in a way that engages both the broad public and government policy-makers. To showcase its expanding projects, the Center launched its website – [www.pulitzercenter.org](http://www.pulitzercenter.org). Headed by John Sawyer, former Washington Bureau Chief for the *St. Louis Post Dispatch*, the Center has funded new reporting projects in Asia, Africa, North America and South America in the last six months. To read about their projects, check out the new website.

### **WEEKLY SECURITY REVIEW: CONVENIENT E-MAIL UPDATES**

The World Security Institute's weekly e-newsletter, *Weekly Security Review*, provides the latest expert analysis on international security issues, and includes an electronic version of CDI's *Defense Monitor* newsletter. Subscribing to the free service brings you more frequent analyses from the Center for Defense Information, a division of the World Security Institute, and WSI's International Media and Programs in China, Russia, Egypt and Belgium. The weekly e-newsletter will also update you on upcoming WSI events, broadcasts from our acclaimed Azimuth Media division, and recent job and internship openings in our divisions.

To subscribe, please e-mail [wparker@worldsecurityinstitute.org](mailto:wparker@worldsecurityinstitute.org).

## **NEW BOOK RELEASE**

### **THE SMALL ARMS TRADE: A BEGINNER'S GUIDE**

The proliferation and misuse of small arms and light weapons is one of the most pressing security threats of the 21st century. Loaded with fascinating anecdotes and disturbing statistics, this guide provides a gripping overview of the global impact that these cheap and easily obtainable weapons have had, the extent of their proliferation, the threat they pose in the wrong hands, and strategies for reining in this deadly scourge.

Covering everything from gun-toting militias to child soldiers to terrorists armed with shoulder-fired missiles, this is required reading for anyone who wishes to fully understand one of today's key threats to international peace.

#### **Coverage includes:**

- A basic introduction to firearms technology and its evolution
- A rich history of the AK-47 assault rifle and Stinger missile
- The politics involved as governments try to curb the illicit trade in small arms and light weapons

#### **Authors:**

- Rachel Stahl, senior analyst, Center for Defense Information at the World Security Institute
- Matt Schroeder, manager, Arms Sales Monitoring Project at the Federation of American Scientists
- Col. Dan Smith, senior fellow on military affairs, Friends Committee on National Legislation

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