

Space Security Survey 2007: Analysis of Results

Introduction

Overview

The Space Security Survey 2007 was open for participation from 6 February 2007 to 6 March 2007. The purpose of the survey was threefold: 1) to receive additions and factual corrections on the draft research for *Space Security 2007*; 2) to get an impression of how people knowledgeable on the use of outer space perceive developments in space, and the issues that they find most important; and 3) to publicize both the research and the issue of space security.

Invitations to participate in the survey were e-mailed to individuals from a range of space fields including civil, military, policy, scientific, and civil society communities and the survey was available through several specialized specialized listserves devoted to space. In total, 74 people knowledgeable on a broad range of space issues completed the survey. The numerical results and highlights of key issues raised in participants' comments follow.

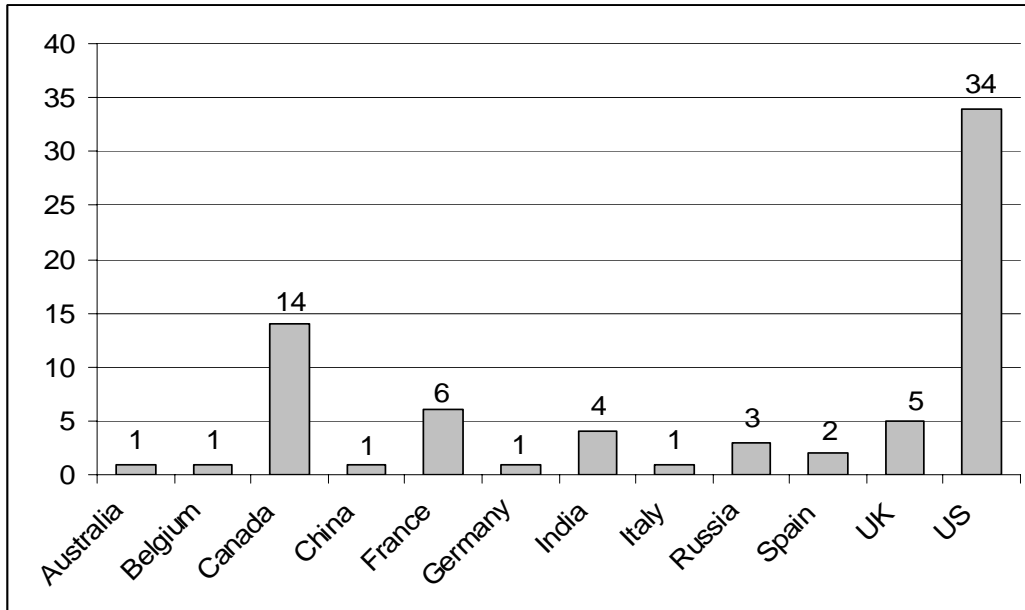
We would like to thank all those who took the time to participate in the survey and to submit their comments.

The research that participants were asked to review has been incorporated into *Space Security 2007*, available at www.spacesecurity.org under the publications section.

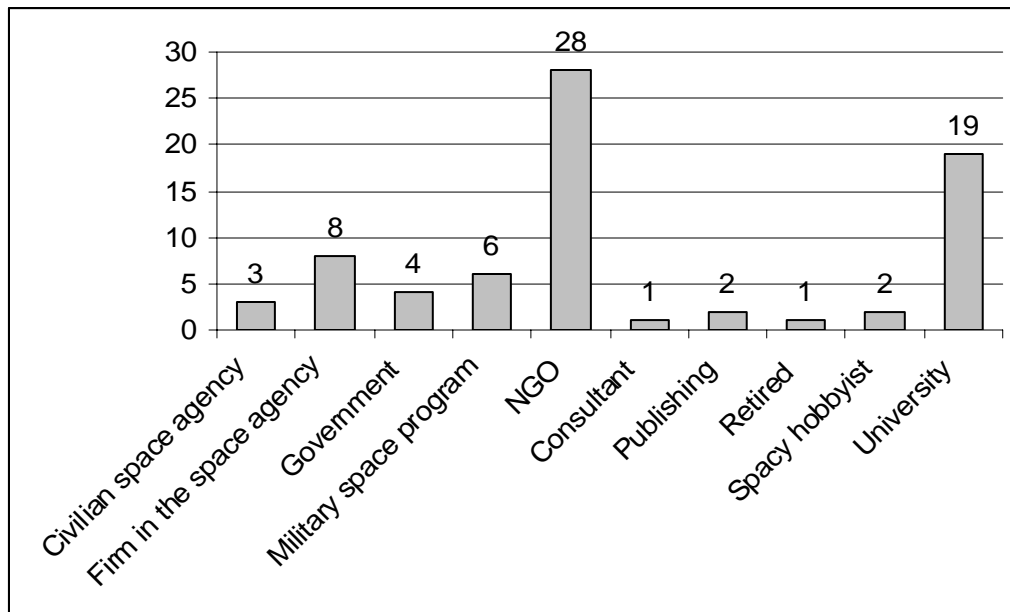
Disclaimer

Spacesecurity.org does not claim that the numerical results below are scientific or statistically-significant, or that they are representative of general or expert opinions. Researchers for *Space Security 2007* used the data and comments collected to verify the initial research, identify gaps, to assess which issues and events were deemed to have had a significant impact on the security of outer space. Feedback from the survey process is provided on this website for the interest of participants and for transparency purposes.

Participation by Country



Participation by Area of Employment



Topic 1: The Space Environment

Survey Responses

On the issues related to this indicator, would you consider yourself:

Expert	12		17.14%
Well informed	34		48.57%
Familiar	22		31.43%
Unfamiliar	2		2.86%

How have developments related to the *mitigation of the impact of space debris* (e.g. surveillance of space and collision avoidance) in 2006 affected space security?

Enhanced	2		2.82%
Somewhat enhanced	29		40.85%
Little or no effect	30		42.25%
Somewhat reduced	5		7.04%
Reduced	3		4.23%
No response	2		2.82%

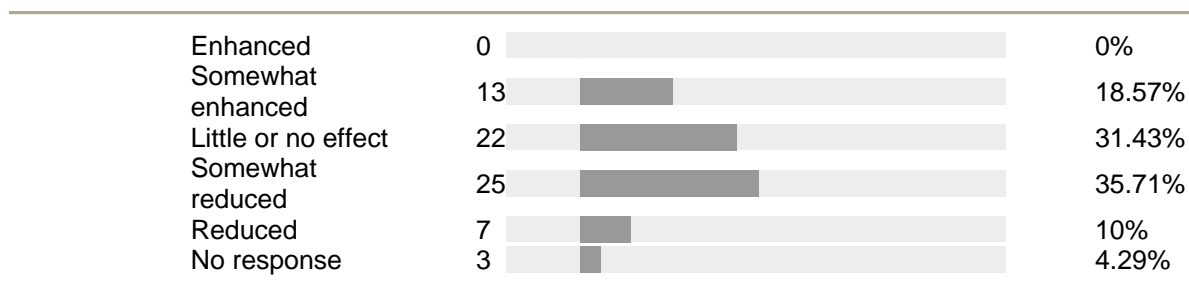
How have developments related to the *allocation of radio frequencies* in 2006 affected space security?

Enhanced	1		1.41%
Somewhat enhanced	9		12.68%
Little or no effect	34		47.89%
Somewhat reduced	8		11.27%
Reduced	1		1.41%
No response	18		25.35%

How have developments related to the *assignment of orbital slots* in 2006 affected space security?

Enhanced	1		1.43%
Somewhat enhanced	6		8.57%
Little or no effect	40		57.14%
Somewhat reduced	7		10%
Reduced	0		0%
No response	16		22.86%

Overall, how have developments related to the space environment in 2006 affected space security?



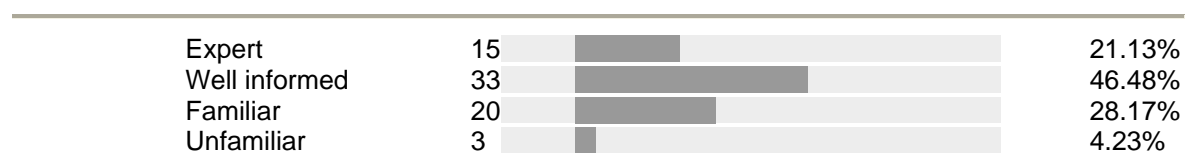
Key Issues

Participants highlighted several key issues that had a detrimental effect on space security, including the Chinese ASAT test, a reduction in the number of sensors on the US Space Surveillance Network, and the cavalier attitude displayed by the golf ball incident on the International Space Station. Comments generally indicated that there is not much concern with orbital slot and radio frequency allocation – international regulation through the International Telecommunications Union and advancing technologies are keeping resource scarcity issues in check.

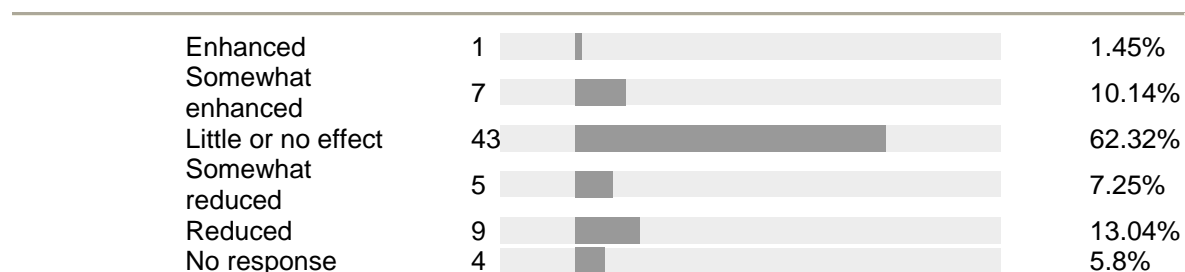
Topic 2: Space Laws, Policies and Doctrines

Survey Responses

On the issues related to this indicator, would you consider yourself:



How have developments related to *international space law* in 2006 affected space security?



How have developments related to space security-relevant *fora and institutions* (e.g. COPUOUS, CD, ITU) in 2006 affected space security?

Enhanced	2		2.86%
Somewhat enhanced	16		22.86%
Little or no effect	38		54.29%
Somewhat reduced	4		5.71%
Reduced	5		7.14%
No response	5		7.14%

How have developments related to the *national space policies* of space actors in 2006 affected space security?

Enhanced	3		4.29%
Somewhat enhanced	7		10%
Little or no effect	11		15.71%
Somewhat reduced	24		34.29%
Reduced	23		32.86%
No response	2		2.86%

How have developments related to the space security relevant *military doctrines* of space actors in 2006 affected space security?

Enhanced	1		1.45%
Somewhat enhanced	9		13.04%
Little or no effect	5		7.25%
Somewhat reduced	25		36.23%
Reduced	27		39.13%
No response	2		2.9%

Overall, how have developments related to space security laws, policies, and doctrines in 2006 affected space security?

Enhanced	2		2.86%
Somewhat enhanced	5		7.14%
Little or no effect	11		15.71%
Somewhat reduced	30		42.86%
Reduced	21		30%
No response	1		1.43%

Key Issues

The US National Space Policy was the most cited development affecting space security by the survey participants. Most comments indicated that it detracted from space security by taking arms control agreements off the table and by instigating similar militaristic or unilateral behaviour by other states. It was, however, pointed out that from the perspective of US national security, the new policy may be beneficial. Moreover, it adds transparency to US intentions in space. The Chinese policy, however, was criticized for lacking transparency. Continued inaction in international fora was also cited as a concern. Finally, the growing importance of space for military purposes was described as both inevitable, but harmful to space security.

The idea of a code of conduct was put forth as a means of enhancing space security in this area.

Topic 3: Civil Space Systems and Global Utilities

Survey Responses

On the issues related to this indicator, would you consider yourself:

Expert	10		14.49%
Well informed	34		49.28%
Familiar	24		34.78%
Unfamiliar	1		1.45%

How have developments related to *access to space* in 2006 affected space security?

Enhanced	1		1.45%
Somewhat enhanced	27		39.13%
Little or no effect	26		37.68%
Somewhat reduced	10		14.49%
Reduced	3		4.35%
No response	2		2.9%

How have developments related to *changing priorities* of the civil space sector in 2006 affected space security?

Enhanced	1		1.47%
Somewhat enhanced	24		35.29%
Little or no effect	30		44.12%
Somewhat reduced	8		11.76%
Reduced	2		2.94%
No response	3		4.41%

How have developments related to *international civil space cooperation* in 2006 affected space security?

Enhanced	3		4.35%
Somewhat enhanced	27		39.13%
Little or no effect	30		43.48%
Somewhat reduced	5		7.25%
Reduced	2		2.9%
No response	2		2.9%

How have developments related to *global utilities* in 2006 affected space security?

Enhanced	1		1.49%
Somewhat enhanced	27		40.3%
Little or no effect	19		28.36%
Somewhat reduced	3		4.48%
Reduced	0		0%
No response	17		25.37%

Overall, how have developments related to civil space programs and global utilities in 2006 affected space security?

Enhanced	1		1.45%
Somewhat enhanced	27		39.13%
Little or no effect	31		44.93%
Somewhat reduced	7		10.14%
Reduced	1		1.45%
No response	2		2.9%

Key Issues

Comments pertaining to this area of space activity were mixed, but generally reflect the survey results that activity in civil space applications and global utilities enhances space security by encouraging greater cooperation and creating incentives to protect space assets and avoid aggressive behavior. It was noted, however, that such cooperation can and does spread dual-use technology, that discrete national capabilities may increase tensions, and that cooperation will not necessarily ensure peace.

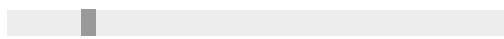




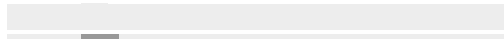
Topic 4: Commercial Space

Survey Responses

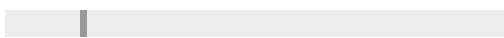



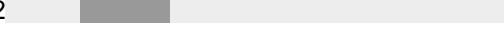

On the issues related to this indicator, would you consider yourself:

Expert	5		7.25%
Well informed	27		39.13%
Familiar	31		44.93%
Unfamiliar	6		8.7%

How have developments related to *growth in the space industry* in 2006 affected space security?

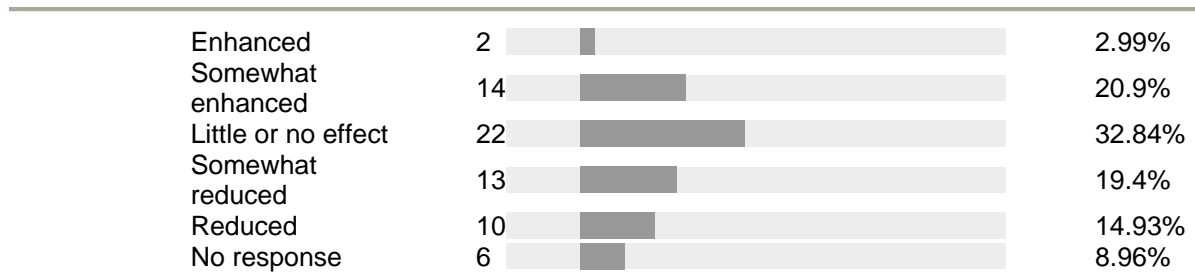
Enhanced	2		2.99%
Somewhat enhanced	24		35.82%
Little or no effect	25		37.31%
Somewhat reduced	11		16.42%
Reduced	0		0%
No response	5		7.46%

How have developments related to *commercial space access* in 2006 affected space security?

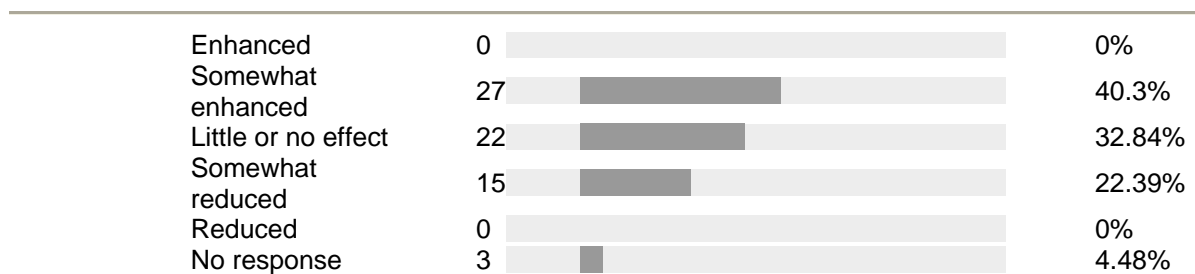
Enhanced	1		1.49%
Somewhat enhanced	26		38.81%
Little or no effect	21		31.34%
Somewhat reduced	12		17.91%
Reduced	1		1.49%
No response	6		8.96%

How have developments related to *military uses of commercial space assets* over 2006

affected space security?



Overall, how have developments related to commercial space in 2006 affected space security?



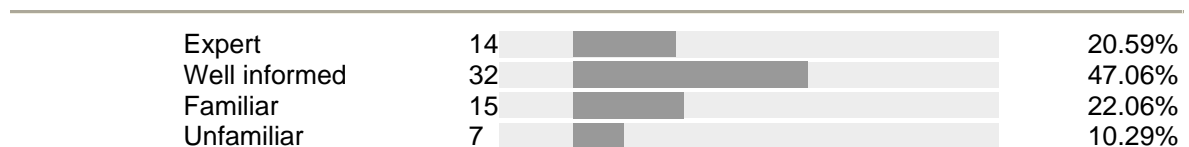
Key Issues

Comments generally agreed that space tourism is worth mentioning in the research, but that it deserves less emphasis given its continuing nascent promise. For the most part the commercial space industry is viewed as having a positive impact on space security because it contributes to international cooperation, creates economic incentives to safeguard space security, and provides wider access to space. On the other hand, it was noted that tensions could arise if the commercial space industry becomes overly conflated with national security. With regards to the relationship between militaries and commercial actors, the main concern was the restrictions that it places on the market-place and the ability to commercialize technologies.

Topic 5: Space Support for Terrestrial Military Operations

Survey Responses

On the issues related to this indicator, would you consider yourself:



How have developments related to the *military space capabilities of the US and Russia* in 2006 affected space security?

Enhanced	1		1.49%
Somewhat enhanced	5		7.46%
Little or no effect	26		38.81%
Somewhat reduced	21		31.34%
Reduced	12		17.91%
No response	2		2.99%

How have developments related to the *growth of actors involved in military space* in 2006 affected space security?

Enhanced	2		3.03%
Somewhat enhanced	9		13.64%
Little or no effect	8		12.12%
Somewhat reduced	24		36.36%
Reduced	21		31.82%
No response	2		3.03%

Overall, how have developments related to space and terrestrial military operations in 2006 affected space security?

Enhanced	1		1.52%
Somewhat enhanced	4		6.06%
Little or no effect	14		21.21%
Somewhat reduced	27		40.91%
Reduced	18		27.27%
No response	2		3.03%

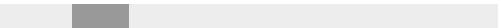

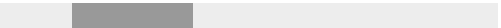
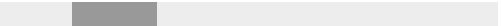
Key Issues

They key concerns highlighted in the comments were that growing military use of space may increase tensions and encourage ASAT use. Increased reliance on space for terrestrial military purposes may also increase desires for ‘space control.’ Otherwise, respondents do not seem to be overly concerned by this area of space activity. Moreover, it was noted that military surveillance capabilities can be beneficial for increasing transparency.

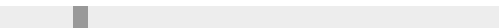
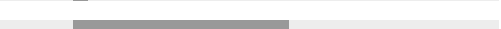


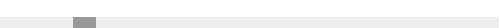
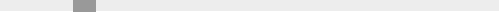
Topic 6: Space Systems Protection

Survey Responses

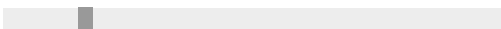




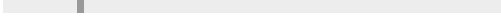
On the issues related to this indicator, would you consider yourself:

Expert	8		11.43%
Well informed	33		47.14%
Familiar	17		24.29%
Unfamiliar	12		17.14%

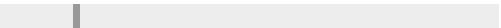
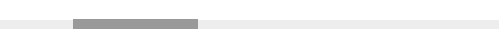
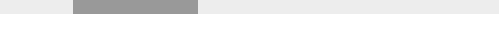

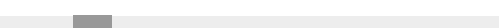
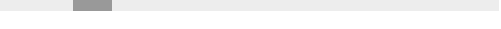
How have developments related to the *detection of attacks* on space systems in 2006 affected space security?

Enhanced	2		3.08%
Somewhat enhanced	28		43.08%
Little or no effect	24		36.92%
Somewhat reduced	3		4.62%
Reduced	2		3.08%
No response	6		9.23%

How have developments related to the *protection of ground stations and communications links* from attack in 2006 affected space security?

Enhanced	2		3.08%
Somewhat enhanced	23		35.38%
Little or no effect	28		43.08%
Somewhat reduced	1		1.54%
Reduced	2		3.08%
No response	9		13.85%

How have developments related to the *protection of space systems from direct attack* in 2006 affected space security?

Enhanced	1		1.56%
Somewhat enhanced	16		25%
Little or no effect	33		51.56%
Somewhat reduced	5		7.81%
Reduced	4		6.25%
No response	5		7.81%

How have developments related to the *ability to rebuild and recover from an attack* in 2006 affected space security?

Enhanced	4		6.25%
Somewhat enhanced	17		26.56%
Little or no effect	28		43.75%
Somewhat reduced	5		7.81%
Reduced	2		3.12%
No response	8		12.5%

Overall, how have developments related to space systems protection in 2006 affected space security?

Enhanced	2		3.12%
Somewhat enhanced	19		29.69%
Little or no effect	27		42.19%
Somewhat reduced	7		10.94%
Reduced	4		6.25%
No response	5		7.81%

Key Issues

The two key comments that emerged are that developments in the area of space systems protection are not yet producing results – technologies are still being tested. Also, there is a very real concern about a protection/negation or offensive/defensive spiral, meaning that advancements in space systems protection efforts are not necessarily positive for space security.

Topic 7: Space Systems Negation

Survey Responses

On the issues related to this indicator, would you consider yourself:

Expert	11		15.94%
Well informed	26		37.68%
Familiar	23		33.33%
Unfamiliar	9		13.04%

How have developments related to proliferation of *capabilities to negate ground stations or communications links* in 2006 affected space security?

Enhanced	0		0%
Somewhat enhanced	2		3.03%
Little or no effect	19		28.79%
Somewhat reduced	26		39.39%
Reduced	12		18.18%
No response	7		10.61%

How have developments related to *space situational awareness* in 2006 affected space security?

Enhanced	2		2.99%
Somewhat enhanced	28		41.79%
Little or no effect	19		28.36%
Somewhat reduced	6		8.96%
Reduced	6		8.96%
No response	6		8.96%

How have developments related to proliferation of *ground-based capabilities to negate space systems* in 2006 affected space security?

Enhanced	1		1.49%
Somewhat enhanced	5		7.46%
Little or no effect	10		14.93%
Somewhat reduced	24		35.82%
Reduced	21		31.34%
No response	6		8.96%

How have developments related to *proliferation of space-based capabilities to negate space systems* in 2006 affected space security?

Enhanced	0		0%
Somewhat enhanced	3		4.48%
Little or no effect	27		40.3%
Somewhat reduced	14		20.9%
Reduced	15		22.39%
No response	8		11.94%

Key Issues

Almost every comment in this section referred to an impending arms race in space, and growing intention by major actors to advance their space negation capabilities.

Topic 8: Space-Based Strike Weapons

Survey Responses

On the issues related to this indicator, would you consider yourself:

Expert	8		11.43%
Well informed	25		35.71%
Familiar	24		34.29%
Unfamiliar	13		18.57%

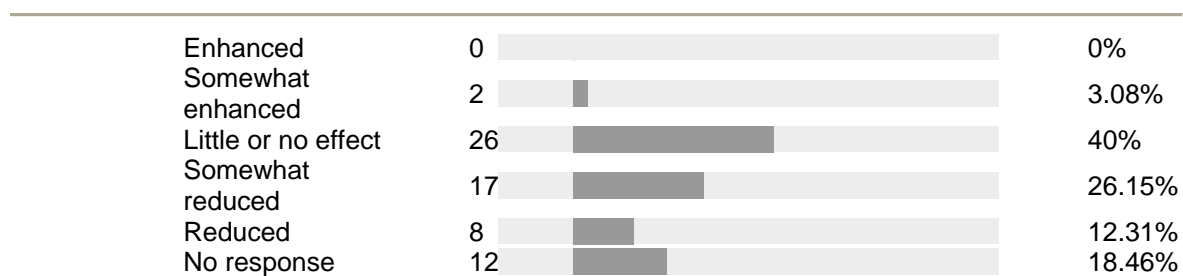
How have developments in 2006 with regard to *enabling technologies* for space-based strike weapons systems affected space security?

Enhanced	1		1.56%
Somewhat enhanced	3		4.69%
Little or no effect	25		39.06%
Somewhat reduced	16		25%
Reduced	14		21.88%
No response	5		7.81%

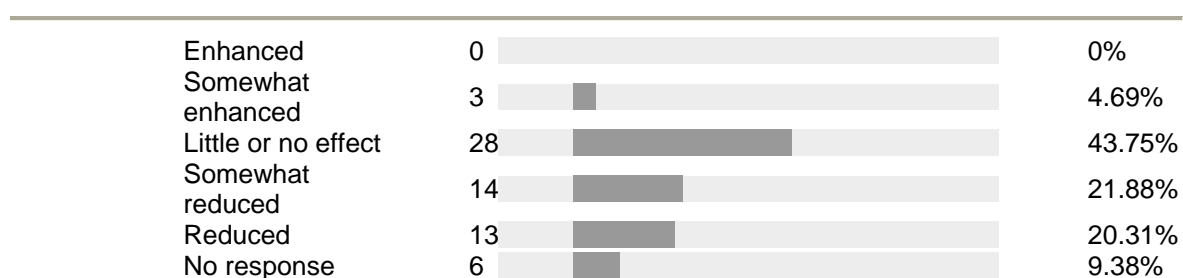
How have developments in 2006 with regard to *mass-to-target (MTT)* space-based strike weapons systems affected space security?

Enhanced	0		0%
Somewhat enhanced	2		3.17%
Little or no effect	27		42.86%
Somewhat reduced	7		11.11%
Reduced	16		25.4%
No response	11		17.46%

How have developments in 2006 with regard to *energy-to-target (ETT)* space-based strike weapons systems affected space security?



Overall, how have developments related to space-based strike weapons in 2006 affected space security?



Key Issues

Respondents generally dismissed concerns about space-based strike weapons on the basis of political caution, reduced budgets, and technological glitches. More concern is expressed for space negation capabilities, also referred to as 'space control.'