EXECUTIVE SUMMARY

Overview of the Workshop

Purpose On October 4-10, 2010, the Asia-Pacific Center for Security Studies held a workshop in Honolulu, Hawaii to identify and assess the most significant current and emerging scientific and technological developments, evaluate their impact on international security, and recommend priority science and technology (S&T) and security policy agenda items based on Asia-Pacific perspectives. Furthermore, it aimed to bring together members of the S&T and security communities from the Asia-Pacific region to engage in a dialogue on current issues of mutual and divergent interests while establishing a common framework to identify the region's challenges defining the S&T-security nexus in the next twenty years.

Attendance Profile APCSS invited 31 participants from 12 countries of the Asia-Pacific region, namely: Australia, Canada, India, Japan, Malaysia, Mongolia, the People's Republic of China, the Republic of the Philippines, the Republic of Korea, Russia, Thailand and the United States. The composition was as follows: 35 percent academics (scientists, engineers, S&T policy professors), 30 percent S&T practitioners (S&T agency/lab directors, consultants), 25 percent security practitioners (military, policy), and 10 percent think tank fellows.

Framing the Issue

- Methodology

  - Subject matter experts (SMEs) provide focused presentations in plenary sessions;
  - Two daily break-out working sessions framed around discussion objectives;
  - Daily plenary participant briefbacks and discussions; and
  - Final group presentations to Dr. William Perry, former U.S. Secretary of Defense and co-director of Stanford University's Center for International Security and Cooperation (CISCA), and Dr. Siegfried Hecker, co-director of CISCA.

- Content Structure

- SME presentations of scene-setters provide overviews of the Asia-Pacific region's security and S&T landscapes, current and future developments in each of the four S&T areas (information technology, biotechnology, energy and environment), their future security implications and areas for international collaboration.

- In break-out sessions, participants tasked to develop the framework of the S&T-security nexus; to identify, prioritize and rationalize the selection of the top S&T phenomena from the four S&T areas that will define the challenges in the S&T-security nexus; and to identify opportunities and challenges for interagency, regional and global cooperation among these phenomena in the next 20 years.

Key Observations and Recommendations

1. Observation There is an obvious gap that exists between the S&T and security communities, with their engagements limited to an "as needed, on demand" basis. Differences in their institutional cultures, an existing knowledge divide and an absence of consensus on the definition of "security" explain the lack of an institutionalized and strategic linkage between these two communities.

1.1 Recommendation Closing the distance between the communities is a key ingredient to collaboratively prepare for the S&T initiatives and phenomena that will most likely have significant global implications in the next 20 years. Bridging this "valley of disconnection" requires a *multi-stakeholder*, *interdisciplinary* frame applied to the discourse on S&T and security issues and concerns. The expanded community should include *"knowledge translators"* who can effectively navigate the S&T and security worlds.

1.2 Recommendation Institutionalize efforts that enable the development of "*interface institutions*" that enable both direct and indirect S&T-security dialogues across countries and organizations, and provide sustainable opportunities for the up-skilling of stakeholders on S&T and security issues.

2. Observation The S&T-related phenomena that are likely to have the most significant global impact and pose significant challenges and opportunities for cooperation in the next years are: *cybersecurity, energy demand and resources* and *water issues*. The selection criteria for these choices are *impact, technology development, institutions and infrastructure.*

2.1 Recommendation *Information Technology* is driving fundamental changes in human society. The overwhelming reliance of critical systems on network connectivity is creating new forms of security threats and exploitable instabilities. There is a need to develop secure software to reduce vulnerabilities, as well as to create network architectures that are intelligent and regenerative. Increasing public-private partnerships will provide significant options to address cyberspace concerns.

2.2 Recommendation *Growing energy demands and the need for diversified energy sources* have broad security implications in the light of global population growth, industrialization and limited fossil fuel supplies. The continued improvement of generation, storage and distribution technologies, alongside the development of modeling capabilities that will enable the optimal match of national needs and resources with technologies, must become a national and regional priority.

2.3 Recommendation *The need for, and access to, clean water* is a critical security issue now and moreso in the future. At least two technical challenges related to another security issue – climate change – provide opportunities for collaboration. The first challenge is the need to explore technologies that can check global warming and comprehensively address the unpredictability of water supply. The second challenge pertains to the improvement of global modeling technologies

that predict climate change through the integration of components that will enhance our understanding of future changes in water.

3. Observation The deepening interface of S&T and comprehensive security developments in a globalized context prompts a reexamination of established approaches to both S&T and security management.

3.1 Recommendation Revisit baseline understanding and formulations of "big" concepts such as risk, vulnerability, adaptability, resilience and disruptive innovation.

3.2 Recommendation Intensify studies of the global/regional spill-over effects of S&T developments on the security environment and vice-versa.

3.3 Recommendation Develop advanced global integrated assessment tools and models to capture the intersection of S&T and security developments and to address the interconnectedness of energy, water, agriculture, global health and climate change.

3.4 Recommendation Enhance and sustain international modes of cooperation and collaboration by leveraging international S&T diplomacy; developing more robust and sustainable private public partnerships; and capturing, institutionalizing and sharing successful collaboration efforts.