

WORLDWIDE EMERGING ENVIRONMENTAL ISSUES AFFECTING THE U.S. MILITARY
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Environmental Policy Institute

APRIL 2007 REPORT

Note to Readers: Pages 1-13 comprise the summary and analysis of this report. Expanded details for some items are in the Appendix beginning on page 14.

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Item 1. UK Initiates UN Security Council Debate on Climate Change and Security

Britain's foreign secretary argued that future climate change might cause wars: "An unstable climate will exacerbate some of the core drivers of conflict, such as migratory pressures and competition for resources," and hence it is a matter for the UN Security Council to address. About 50 nations urged the UK to take the issue to the Council. During the debate on April 17, 2007, China argued against this position along with Russia, Qatar, Indonesia, and South Africa, saying that the Security Council is the wrong forum to discuss this and act on climate change-related issues. On behalf of 130 developing nations, Pakistan argued that the issue should be a matter for the UN General Assembly since it was a more democratic institution than the Council. [Yet it is the Council not the Assembly that can authorize peacekeeping forces.] Secretary-General Ban Ki-moon, acknowledging, "issues of energy and climate change can have implications for peace and security," called for a "long-term global response" and noted, "this Council has a role to play in working with other competent intergovernmental bodies to address the possible root causes of conflict discussed." The US supported the development of alternative fuels, energy efficiency, and other voluntary approaches that did not affect economic growth. The EU, Peru, Panama, and Papua New Guinea (head of the Pacific small island states), were among the supporters of the initiative. "The dangers that the small island states and their populations face are no less serious than those nations threatened by guns and bombs," stated Ambassador Robert Guba Aisi of Papua New Guinea.

Military Implications:

Environmental security is likely to become a more common area for UN Security Council action; hence, the military should consider how this could change the nature, composition, and training requirements of future peacekeeping missions related to environmental security. This is not an issue of whether or what part of climate change is caused by humans, but of the consequences of scientifically documented climate change and actual impacts on societies.

Sources: (see a more expanded list in the [Appendix](#))

Security Council Holds First-Ever Debate on Impact of Climate Change on Peace, Security, Hearing Over 50 Speakers

<http://www.un.org/News/Press/docs/2007/sc9000.doc.htm>

Secretary-General Ban's Statement in Security Council Debate on Climate Change

<http://www.reformtheun.org/index.php?module=uploads&func=download&fileId=2262>

Item 2. European Environmental Liability Directive Came Into Force

The Environmental Liability Directive establishes a comprehensive framework on liability for damage to the environment, based on the "polluter pays" principle. It aims to ensure that the financial liability for environmental damage prevention or remediation falls on the polluters who caused it, rather than on the taxpayers. Operators are financially responsible for ensuring that they have preventive or remedial measures. When the environmental situation involves more than one member state, then they must cooperate on the necessary preventive or remedial actions. The Directive was adopted in April 2004 and member states were supposed to bring into force the appropriate laws and regulations by April 30, 2007. [See also *European Union Polluter Pays Law*

in April 2004, and *Environmental Crime Could Become a Felony in the EU* in February 2007 environmental security reports.]

Military Implications:

The Directive's *Article 4 Exceptions* includes a provision for the military: Paragraph 6 stipulates that "This Directive shall not apply to activities the main purpose of which is to serve national defence or international security nor to activities the sole purpose of which is to protect from natural disasters." However, since the Army Corps of Engineers and other civil-type activities seem not to be covered by the exception, the military and its contractors acting in the European arena should increase attention to the environmental consequences of their activities.

Sources:

Environment: Liability Directive ensures polluters pay

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/581&format=HTML&aged=0&language=EN&guiLanguage=en>

Environmental liability – Directive

<http://europa.eu/scadplus/leg/en/lvb/l28120.htm>

Directive 2004/35/CE of the European Parliament and of the Council

http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexplus!prod!DocNumber&lg=en&type_doc=Directive&an_doc=2004&nu_doc=35

Item 3. Russia's Floating Nuclear Plants Pose International Security Risk

Russia has started building the world's first floating nuclear power plant. A ship with two 35-megawatt reactors is expected to be operational in three years and supply electricity in remote areas in Russia as well as potential foreign markets. Despite warnings from environmentalists, Russia plans to build seven of these nuclear ships. [See also *Increasing Nuclear Safety and Security* in March 2006 environmental security report]

Military Implication

Mobile nuclear reactors could be vulnerable to both natural disasters such as tsunamis and potential attacks/hijacks by terrorists. Since 12 countries including China, Indonesia, Malaysia, Algeria and Argentina have already been listed as potential buyers, the military should start exploring possible responses if an accident or attack were to occur outside of Russian waters. Note: since the U.S. Corps of Engineers operated the Sturgis, a "nuclear barge" facility in a re-used Liberty ship for many years, the U.S. has some experience with the basic concept and its security aspects.

Source:

Floating nuclear power stations raise spectre of Chernobyl at sea

<http://www.timesonline.co.uk/tol/news/world/europe/article1662889.ece>

Item 4. Growing Health Concerns over Electromagnetic Fields Might Trigger New Regulations

4.1 Warnings on Possible Wi-Fi Dangers

The expansion of wireless connections and use increases experts' concerns and warnings on possible health effects of electronic smog. Recent research suggesting that use of mobile phones might increase brain tumor occurrence worsens concerns about the possible impact of the spreading Wi-Fi networks that expose people to electronic waves involuntarily. The spread of wireless connections might be dangerous mostly to the health of children and to the additional ~3% of population that the World Health Organization estimates are "electrosensitive." Sir William Stewart—chairman of the UK Health Protection Agency and former chief scientific adviser to the UK Government—along with some European governments, school boards and parents, scientists, and doctors are calling for an official investigation of the risks that electronic waves might pose to human health and the environment. [See also *Conviction in Transborder Electromagnetic Pollution Case* in May 2005, *Study Says Mobile Phones Raise Tumor Risk* in April 2006, and *Cell Phones Damage Rat Brains* in February 2004 environmental security reports.]

4.2 Potential Magnetic Fields Regulations in Japan

The Japanese Ministry of Economy, Trade and Industry plans to introduce regulations concerning magnetic fields around power-transmission cables and other electric facilities. Although the country has regulations on electric fields, *per se*, magnetic fields are not subject to any standards. A working group will be created in June under the Subcommittee on Electric Power Safety to conduct investigations on the link between electromagnetic fields and human health problems, and to advise the ministry. The initiative seems to be partly triggered by a study to be released soon by the World Health Organization on environmental health standards regarding electromagnetic fields. Along the same lines, the UK is finalizing a report that assumes a link between power lines and cancer, and that therefore recommends regulations for building around high-voltage power cables because of possible health risks.

Military Implications:

Research for determining the possible impact of electromagnetic fields and electronic smog on human health and the environment is increasing. The military, in addition to closely following the scientific research, should be investigating what steps would need to be taken, if the fears prove well founded, and such devices become the subject of restrictive regulations. Future soldier support developments, not only in communication, but in such areas as robot-assist, weapon targeting, hostile fire tracking, battlefield monitoring, and personal physiological monitoring will add to the fog of electromagnetic fields on and within soldiers' bodies and should be assessed in totality for possible additive and synergistic health impacts.

Sources:

Hi-tech horrors

http://comment.independent.co.uk/leading_articles/article2472074.ece

Danger on the airwaves: Is the Wi-Fi revolution a health time bomb?

http://news.independent.co.uk/uk/health_medical/article2472140.ece

Apiculture world abuzz over theory that cellphone radiation may be killing bees

<http://www.canada.com/topics/technology/news/gizmos/story.html?id=4734ad59-f543-4ac5-ae34-d33431e59be2&k=74835>

Industry ministry to regulate magnetic fields

<http://www.asahi.com/english/Herald-asahi/TKY200704260232.html> (article not available anymore on the website; full text in the [Appendix](#))

Power lines in new link to childhood leukaemia

<http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2007/04/21/nleuk21.xml>

Item 5. Technological Breakthroughs with Environmental Security Implications

5.1 Biologically Based Dyes Dramatically Lower Solar Cell Costs

Massey University's Nanomaterials Research Centre in Wellington, New Zealand, has developed a range of colored dyes for use in dye-sensitized solar cells that promises to lower costs by 90% compared to silicon-based photo-electric solar cells. The dyes are related to such organic molecules as chlorophyll and hemoglobin. The cells have the added advantage of working well in low-light environments. [See also *Photonic Crystal Provides 50% Cost Reduction* in March 2007 environmental security report.]

Military Implications:

The military should investigate this research for applications from roofing to portable systems.

Source:

Taking nature's cue for cheaper solar power

http://masseynews.massey.ac.nz/2007/Press_Releases/04-04-07.html

5.2 New Solar Cell/Battery Combination Saves Size and Weight

A new family of batteries incorporating solar cells for self-charging is being developed by an international partnership of Konarka Technologies of Lowell MA, a maker of thin-film "plastic" solar cells, and the German company VARTA-Microbattery, which layered Konarka's technology onto a lithium-polymer battery. Not only are the new devices small and light, they also operate even at lower levels of illumination.

Military Implications:

The military should investigate this research for applications in portable and self-sustaining energy units.

Source:

Gadget recharges itself -- shocking!

<http://www.thestar.com/sciencetech/article/203401>

5.3 New Device to Suck CO₂ from the Air

Towers with materials that absorb carbon dioxide (CO₂) directly from the air and then release it as a pure stream of carbon dioxide for sequestration have been developed by scientists from Columbia University and Global Research Technologies, LLC. It is estimated that if these devices had openings 10 meters by 10 meters they could each extract about 1,000 tons each year; hence, one million of these units could remove 1 billion tons of CO₂ from the air per year. These could be placed at the best locations for carbon sequestration, regardless of carbon source.

Military Implications:

If this approach proves effective, then it could become an attractive carbon trade-off investment against military carbon-emitting activities, along with other approaches such as powdered iron in the ocean, tree plantings, and desert coastline seawater agriculture.

Sources:

First Successful Demonstration of Carbon Dioxide Air Capture Technology Achieved by Columbia University Scientist and Private Company

<http://www.earthinstitute.columbia.edu/news/2007/story04-24-07.php>

Giant carbon vacuums could cool Earth

<http://www.csmonitor.com/2007/0419/p13s01-sten.html>

Item 6. Updates on Previously Identified Issues**6.1 Controversy over a United Nations Environmental Organization Continues**

Last February France along with 46 other countries proposed the establishment of a UN Environmental Organization to encourage and coordinate research and government actions to address climate change. During the Security Council's debate over security implications of climate change, Italy's deputy foreign minister, Vittorio Craxi, renewed support for creating a UN environmental organization. The U.S. affirmed support for strengthening the United Nations Environment Programme, but saw no need to create a new UN agency, arguing that the existing UNEP is sufficient for helping countries honor environmental treaty obligations. [See also *French President Jacques Chirac issues Paris Call for Action for Global Ecological Governance* in February 2007, and *New International Strategy for Chemicals Management and 9th Special Session of the UNEP Governing Council* in February 2006 environmental security reports.]

Military Implications:

Considering the rising concern over the importance of environmental issues for global security, and the need for a better international coordination of funds, research, and governmental guidance, it is likely that the debate for a stronger UN environmental agency will continue. In anticipation of such increased coordination, the military should: 1) consider developing a list of environmental security related priorities whose progress would be enhanced by such international coordination and 2) ask to participate in discussions/negotiations.

Sources:

U.S. Rejects Call for Tougher U.N. Environment Role

<http://www.enn.com/today.html?id=12588>

Security Council Holds First-Ever Debate on Impact of Climate Change on Peace, Security, Hearing Over 50 Speakers

<http://www.un.org/News/Press/docs/2007/sc9000.doc.htm>

6.2 European Directive on Ship-Source Pollution Became Effective on April 1, 2007

Directive 2005/35 on ship-source pollution and the introduction of penalties for infringements became effective April 1, 2007 across all 27 EU member states. The Directive introduces application of criminal penalties for gross negligence or illegal discharges of polluting substances at sea. It came into force in October 1, 2005 with implementation on March 1, 2007, and the EU member states were obligated to incorporate it into their national laws by March 31, 2007. Note:

by 2011, the International Maritime Organization will require all ships to be equipped with a voyage data recorder, similar to the black box on an aircraft. This will greatly help the new directive's enforcement. [See also *Political Agreement Reached on the European Marine Strategy Directive* in December 2006, *Europe to Harmonize Marine Pollution Legislation* in July 2005, and *International Maritime Organization (IMO) wants global rather than many different local or regional rules* in January 2003 environmental security reports.]

Military Implications:

Since the Directive stipulates no exception for the military, increased prudence to avoid any negligence or pollution should be considered, as appropriate under Status of forces Agreements. Although the Directive's power is limited to EU waters, increased international cooperation could generate new regulations and marine environmental pollution monitoring systems elsewhere.

Sources:

New EU rules to crack down on sea pollution come into effect

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/442>

Europe Tightens the Screws on Vessels Polluting Ocean Waters

<http://www.ens-newswire.com/ens/mar2007/2007-03-29-05.asp>

Maritime safety, prevention of pollution caused by ships: penalties for infringements

<http://www.europarl.europa.eu/oeil/file.jsp?id=230932>

6.3 Roadmap for Establishing the Global System of Marine Protected Areas

Establishing a Marine Protected Areas network by the year 2012 was proposed at the First International Marine Protected Areas Congress held in October 2005. *Establishing Networks of Marine Protected Areas – Making It Happen* is a roadmap for helping to meet that goal. Launched at the World Conservation Union (IUCN) Marine Protected Area Summit in Washington, DC, April 11, 2007, it was published by the National Oceanic and Atmospheric Administration, in collaboration with the IUCN World Commission on Protected Areas, the Great Barrier Reef Marine Park Authority, the World Wildlife Fund–Australia, and The Nature Conservancy. [See also *Network of Marine Protection Areas to be Adopted by 2012* in October 2005, *Marine Environment Needs More Protection* in March 2007, *Stronger Regulations to Protect Ocean Marine Environments* in March 2006 environmental security reports.]

Military Implications:

Relevant military personnel should consider reviewing the roadmap for eventual new directives and/or regulations that might be triggered by its implementation.

Sources:

New road map for establishing marine protected area networks

http://www.iucn.org/en/news/archive/2007/04/11_marine_protected_areas.htm

Establishing Networks of Marine Protected Areas – Making It Happen

<http://www.iucn.org/themes/wcpa/biome/marine/mpanetworks/networks.html>

6.4 New Concerns Rising over Chemical Weapons

The Organization for the Prohibition of Chemical Weapons (OPCW), the Chemical Weapons Convention's (CWC) secretariat, focuses on issues related to existing weapons, but specialists argue that new, modern chemicals and production plants could represent even higher risk. Jonathan Tucker of the German Institute for International and Security Affairs in Berlin remarks

that a “new generation of small, flexible batch-processing chemical plants that can quickly be switched to producing any number of chemicals are not being inspected at all... and there are five times as many of them as there are declared dual-use plants.” New molecules, such as the “novichok” nerve agents, or “incapacitants” such as fentanyl are overlooked, undermining the “international norm” and confidence in the CWC. [See also Eleventh Chemical Weapons Convention in December 2006, *Five Countries Organize CWC National Authorities* in May 2006, and other related items in previous environmental security reports.]

Military Implications:

[Similar to previous on the same issue] The state of current and potential weaponizable chemicals and of chemical plants should continue to be reviewed in light of possible violations of the CWC or of eventual amendments to the CWC. Those with responsibilities in this area should consider assessing national and international opportunities for assisting in compliance and improving efficiency of the CWC regulations.

Sources:

Chemical weapons still causing concern

<http://www.newscientisttech.com/channel/tech/mg19426014.700?DCMP=NLC-nletter&nsref=mg19426014.700>

Chlorine bombs pose new terror risk

http://www.usatoday.com/news/washington/2007-04-23-chlorine-truck-bomb_N.htm

New chemical rules spark controversy

<http://www.sanluisobispo.com/353/story/23958.html>

6.5 Climate Change—Research Aspects

6.5.1 Adaptation and Vulnerability Report by the IPCC

The Intergovernmental Panel on Climate Change (IPCC) report *Climate Change 2007: Impacts, Adaptation and Vulnerability* reinforced the scale of the implications of climate change and focused the international community on the emergency of acting on mitigation and adaptation strategies. The report shows that the most severe impacts of climate change will be experienced by people in the poorest regions who have emitted the least amount of greenhouse gases. Billions of people would face water scarcity and hundreds of millions, hunger. Vulnerability to climate change could be exacerbated by other stresses—such as poverty, unequal access to resources, and conflict. Africa will be mostly affected by water and food shortage; low-lying areas worldwide are threatened by floods, erosion, and rising sea levels; changes in precipitation patterns and the disappearance of glaciers from Asia to Latin America will affect water availability for human consumption, agriculture and energy generation; heat waves, forest fires, and extreme weather conditions will increase mainly in North America and Europe. “These projected impacts tell us that we urgently need to launch an agreement on future international action to combat climate change, as well as look for effective ways to generate the funds needed for adaptation,” says Yvo de Boer, executive secretary of the United Nations Framework Convention on Climate Change. The “Summary for Policymakers” suggests that a portfolio of adaptation and mitigation measures is needed to diminish the risks associated with climate change. The Summary, approved by government officials, will most probably guide future strategies such as a post-Kyoto policy, and establishing global mitigation and adaptation frameworks. The third report, *Mitigation of Climate Change* is scheduled for release in May, and the final *Synthesis Report* for November 2007.

6.5.2 Indian and Chinese Assessments of Climate Change Consequences

Indian and Chinese authorities have increased warnings on the consequences of global warming on the coastal areas. In India, the National Coastal Zone Management Authority notes that millions of people living along India's 3,700 km (2,300 mile) eastern coast are vulnerable to storms, flooding and tsunamis; sea levels in some parts of the Bay of Bengal were rising at a rate of 3.14 mm annually, while off the coast of Khulna in Bangladesh the rate is 10 mm every year, and rising sea levels are eroding 1 meter (3.2 feet) of land every year along the coast of West Bengal state. India plans to conduct a study next year on how to mitigate the vulnerability to climate change of its 7,500 km (4,660 mile) coastal area. The first Chinese official National Climate Change Assessment also warns on devastating consequences of climate change on the Chinese economy (mainly agriculture) and increasing vulnerability of its coastal areas. Nevertheless, economic development remains the country's primary task, neglecting radical measures to address greenhouse gas emissions and pollution, states a report.

6.5.3 Indigenous Peoples Highly Vulnerable to Climate Change

An international symposium at Oxford University focused on the threat of climate change to the world's indigenous peoples. They have already begun feeling the consequences of climate change and in some cases their whole way of life has to change radically, as they depend directly on natural resources threatened by global warming. It was agreed that indigenous communities have to work together with scientists and decision makers for designing and implementing adaptation measures for preventing possible catastrophic consequences of global warming on their people.

Military Implications:

[Same as previous on similar issues] Increasingly more compelling evidences and warnings on climate change amplify international discourse and increase the emergence of international policies trying to tackle the causes and develop strategies to mitigate climate change effects.

Sources: (see a more expanded list in the [Appendix](#))

Climate Change 2007: Impacts, Adaptation and Vulnerability

<http://www.ipcc.ch/SPM6avr07.pdf>

UN Experts Near Deal on Climate After Disputes

<http://www.planetark.com/dailynewsstory.cfm/newsid/41284/story.htm>

Global Warming to Devastate Indian Coast – Expert

<http://www.planetark.com/dailynewsstory.cfm/newsid/41512/story.htm>

China Says Global Warming Threatens Development

<http://www.planetark.com/dailynewsstory.cfm/newsid/41506/story.htm>

Symposium: Indigenous Peoples and Climate Change. Thursday and Friday, 12-13 April 2007

Environmental Change Institute, University of Oxford

<http://www.eci.ox.ac.uk/news/events/070412conference.php>

6.6 Space Technology for Environmental Security

The 2007 ESA Envisat Symposium discussed how ESA (European Space Agency) satellites could improve understanding of the carbon cycle and thus advance climate change forecasting, improve decisionmaking, and also improve monitoring of international treaties aimed at reducing greenhouse gas emissions, such as the Kyoto Protocol. Special sessions were dedicated to the Global Monitoring for Environment and Security (GMES) program, and use of Earth observation satellites in support of international environmental conventions. Prior to the Symposium a high-level conference was held: “The Way to the European Earth Observation System

GMES—Munich Roadmap” regarding the first GEMES services, the Commission’s proposal for GEMES long-term sustainability, and the proposal for adoption by the Council and implementation of the first generation of GMES-dedicated satellites. GMES is also a key part of the new European Space Policy adopted by the European Commission, to be presented for discussion and endorsement to the Space Council on 22 May 2007. [See also *Space Technology for Improving Planetary Knowledge and Security* in April 2006, *Space Technology to Help Enforce Environmental Regulations* in November and *Climate Change--Improved Satellite Climate Change Monitoring* in June 2005 and other related items in previous environmental security reports.]

Military Implications:

[Same as previous on similar issues] Developing an integrated environmental monitoring capability to provide informed data to the public, and policy- and decision-makers, would considerably improve the assessment of potential environmental impacts of different actions, facilitate enforcement of international treaties worldwide, and could help mitigate environmental and social consequences induced by conflict or natural disasters. The military should consider full cooperation in all the phases—from development to implementation and use of space-based observation systems.

Sources:

Satellites play vital role in understanding the carbon cycle

http://www.esa.int/esaEO/SEMLEHMJC0F_planet_0.html

2007 ESA ENVISAT Symposium <http://www.envisat07.org/>

Envisat Symposium 2007 kicks off in Switzerland

http://www.esa.int/esaEO/SEMNU9MJC0F_index_0.html

Satellites vital for environmental agreement

http://www.esa.int/SPECIALS/ESApod/SEMQ8DMJC0F_0.html

A high-level conference on Global Monitoring for Environment and Security

<http://www.gmes.info/newsdetail+M5a32281b86a.0.html>

EC has adopted the European Space Policy

http://ec.europa.eu/enterprise/space/index_en.html

6.7 European Temporary Committee on Climate Change to Begin Operations in May

The European Parliament approved the establishment of a new temporary committee on climate change. The 60-member committee will start work on May 10, 2007. It will design and suggest strategies and policy options for the 27 EU states to address energy and climate change issues. It is also expected that the committee will strengthen EU’s international role in intensifying action to tackle climate change, pushing it to the top of the international agenda and furthering post-Kyoto Protocol’s negotiations. [See also *EU Energy and Climate Change Policy* in March 2007 environmental security report.]

Military Implications:

The military should follow the developments and proposals of the new committee for eventual implications for new environmental regulations, standards, or policies, and consequently emerging strategies, to help anticipate new requirements that might affect military operations.

Sources:

Commissioner Dimas welcomes European Parliament decision to set up temporary committee on climate change

<http://europa.eu/rapid/pressReleasesAction.do?reference=IP/07/568&format=HTML&aged=0&language=EN&guiLanguage=en>

Stavros Dimas. Member of European Commission, responsible for environment Climate change and sustainable use of energy ASEM Environment Minister's meeting Copenhagen, 25 April 2007

<http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/07/250&format=HTML&aged=0&language=EN&guiLanguage=en>

6.8 Ban on Incandescent Light Bulbs Expands

As part of the plan to cut down on energy consumption and greenhouse gas emissions, the phase-out of incandescent bulbs expands. Canada is expected to introduce new regulations by the end of this year, requesting the phase-out of inefficient incandescent lighting in common uses be completed by 2012. Canada is the second country to introduce such a nationwide regulation, after Australia, where the ban is scheduled for 2009–10. [See also *Compact Fluorescent Light Bulbs (CFLs) May Surge to Fore* in February and *European Lamp Companies Push Compact Fluorescents, as Does the EU* in March 2007 environmental security reports.]

Military Implications:

In anticipation of these restrictions (and because of CFLs' inherent advantages), the military should begin planning for an eventual worldwide switchover to the new devices.

Sources:

Lighting the Way to a Greener Future: Canada's New Government to Ban Inefficient Light Bulbs

<http://news.gc.ca/cfmx/view/en/index.jsp?articleid=295459&>

Ontario turns out the lights on inefficient bulbs

<http://www.cbc.ca/canada/toronto/story/2007/04/18/ontario-lightbulb-ban.html>

Australia says lights out to incandescent bulbs

<http://www.cbc.ca/technology/story/2007/02/20/tech-bulb.html>

6.9 Nanotechnology Safety Issues

Nanotechnology safety assessment activities are increasing. Some noteworthy ones are: (More detailed description of each is available in the [Appendix](#))

- A review by the UK Council for Science and Technology (CST) criticizes UK, U.S., and some other countries' governments' efforts to provide support for nanotechnology research for progressing too slowly
- Two research projects at Rensselaer Polytechnic Institute have shown that nanomaterials' biological risks is a complex problem since the size, type, and dispersion of nanomaterials all may affect the materials' biological effects.
- The European Commission has launched a public consultation on the preliminary opinion of the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) in regard to nanomaterials. The online consultation runs until 23 May 2007.
- Informa Healthcare has started publication of a new quarterly journal, *Nanotoxicology*, in both online and print versions
- *An Issues Landscape for Nanotechnology Standards: Report of a Workshop* report by the Institute for Food and Agricultural Standards (IFAS) at Michigan State University

- Nanotech Products Meeting to Be Held in London, 16-17 May—updated information

Military Implications:

[Same as previous on similar issues] Relevant military personnel should review information generated by these assessments on nanotech environmental health and safety to improve military and contractor practices, as well as to assist and cooperate with the organizations working on those issues for enriching their studies.

Sources:

Nanosciences and Nanotechnologies: A Review of Government's Progress on its Policy Commitments http://www.cst.gov.uk/cst/news/Files/nano_review.pdf

When It Comes to Risk, Not All Nanomaterials Are Created Equal [http://news.rpi.edu/update.do?artcenterkey=2038&setappvar=page\(1\)](http://news.rpi.edu/update.do?artcenterkey=2038&setappvar=page(1))

Public consultation on SCENIHR Opinion on The appropriateness of the risk assessment methodology in accordance with the Technical Guidance Documents for new and existing substances for assessing the risks of nanomaterials

http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/scenihhr_cons_04_en.htm

Nanotoxicology <http://www.informaworld.com/smpp/title~content=t716100760>

(From first issue: New methods and tools needed to measure exposure to airborne nanomaterials <http://www.physorg.com/news96032587.html>)

An Issues Landscape For Nanotechnology Standards: Report of a Workshop

<http://ifas.msu.edu/NSWorkshopReport.pdf>

Item 7. Reports Suggested for Review**7.1 Climate Change a Serious Threat to Security, Conclude Eminent Military Officers**

National Security and the Threat of Climate Change, a report by the CNA Corporation, presents the conclusions of an eminent Military Advisory Board (consisting of retired senior military officers and national security experts) on the security implications of climate change. The report looks at the geo-strategic implications of climate change in general and its effects on international security. It explores specific regional security challenges in Africa, Asia, the Middle East, Europe, and the Americas; discusses the direct impact of some climate change aspects on military systems and operations; and presents a set of findings and recommendations related to mitigation, adaptation, and preparation, as well as policies in response to climate change. It warns that climate change could seriously exacerbate already marginal living standards... causing widespread political instability and the likelihood of failed states.... The chaos that results can be an incubator of civil strife, genocide, and the growth of terrorism... The U.S. may be drawn more frequently into these situations, either alone or with allies, to help provide stability before conditions worsen and are exploited by extremists. The U.S. may also be called upon to undertake stability and reconstruction efforts once a conflict has begun, to avert further disaster and reconstitute a stable environment." Therefore, "The consequences of climate change can affect the organization, training, equipping, and planning of the military services."

Military Implications:

Although the military is well aware of the report and its findings, it is added here due to its importance to the overall record of developing international issues of environmental security.

Sources:

National Security and the Threat of Climate Change

<http://securityandclimate.cna.org/report/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf>

Climate Change Poses Serious Threat to U.S. National Security

<http://securityandclimate.cna.org/news/>

Could global warming cause war?

<http://www.csmonitor.com/2007/0419/p02s01-usgn.html>

7.2 Environment and Security Initiative Progress Report 2006

The Environment and Security Initiative—An international partnership for managing conflict and risk, progress report 2006, highlights advancement of ENVSEC sub-regional projects' implementation in the Southern Caucasus, Central Asia and South Eastern and Eastern Europe, as well as the initiation of an environment and security risk assessment in the Belarus, Moldova and Ukraine sub-region. The issues identified for urgent attention by ENVSEC include: wastes, stocks of rocket fuel and obsolete pesticides from Soviet times, shared waters, and the continuing environmental consequences of the Chernobyl disaster. "Activities conducted under the ENVSEC Initiative show that environment can act as a bridge for crossboundary cooperation" says the report. The 2007–2009 work program includes over 70 projects based on region-specific priorities "related to need of further assessments, policy development, institution and capacity building as well as technical cooperation."

Military Implications:

Relevant military personnel working on security issues in the sub-regions highlighted in the ENVSEC report might consider consulting the report for eventual inputs to future reports on areas of concern, as well as noting success stories and considering their possible emulation.

Source:

The Environment and Security Initiative—An international partnership for managing conflict and risk

<http://www.envsec.org/docs/ENVSEC%20Progress%20Report%202006.pdf>

7.3 Earth Portal Is a New Online Resource for Environmental Information

The National Council for Science and the Environment, the secretariat for the Environmental Information Coalition, has announced that the Coalition is launching a new online environmental information resource, the Earth Portal www.earthportal.org. The site features an Encyclopedia of Earth (2,300 articles to start with), Earth News, Earth Forum, and a weekly Environment in Focus special article. It is a free, peer reviewed, comprehensive source for "timely, objective, science-based information... built by a global community of environmental experts".

Military Implications:

Military personnel involved in environmental policy might consider periodically consulting the Earth Portal, as well as contributing to it.

Sources:

NCSE Strategic Overview

<http://www.ncseonline.org/05earthportal/cms.cfm?id=1250>

Earth Portal www.earthportal.org

7.4 Proceedings of the Workshop *Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors*

The workshop “Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors” was held April 26-29, 2007 in Lisbon, Portugal. The objective of the workshop was to explore how to improve risk assessment and modeling for non-chemical environmental stressors by adapting chemical risk assessment approaches and tools. The outcomes of the workshops were not available at the time of this writing.

Military Implications:

Military personnel concerned with risk assessment related to the environment should consider contacting their colleagues who are members of the Organizing Committee to get the proceedings or conclusions and recommendations generated by the workshop.

Source:

Risk, Uncertainty and Decision Analysis for Environmental Security and Non-chemical Stressors
<http://www.risk-trace.com/portugal/index.php>

APPENDIX

Reference Details

This Appendix contains expanded background information on some items.

Item 1. UK Initiates UN Security Council Debate on Climate Change and Security

Sources: (more expanded list)

Security Council Holds First-Ever Debate on Impact of Climate Change on Peace, Security, Hearing Over 50 Speakers

<http://www.un.org/News/Press/docs/2007/sc9000.doc.htm>

Secretary-General Ban's Statement in Security Council Debate on Climate Change

<http://www.reformtheun.org/index.php?module=uploads&func=download&fileId=2262>

U.N. Security Council holds climate debate

<http://edition.cnn.com/2007/TECH/science/04/17/climate.un.britain.ap/>

U.N. Council Hits Impasse Over Debate on Warming. The NY Times

<http://www.nytimes.com/2007/04/18/world/18nations.html?ex=1334548800&en=599119af2640e7b1&ei=5088&partner=rssnyt&emc=rss>

Global warming an issue for UN Security Council

<http://environment.newscientist.com/article/dn11619-global-warming-an-issue-for-un-security-council.html>

'Environmental security' essential

<http://www.guardian.co.uk/uklatest/story/0,-6568208,00.html> (article available for a limited time; text [below](#))

U.S. Rejects Call for Tougher U.N. Environment Role

<http://www.enn.com/today.html?id=12588>

UN Security Council to Debate Climate Change

<http://www.planetark.com/dailynewsstory.cfm/newsid/41268/story.htm>

'Environmental security' essential

<http://www.guardian.co.uk/uklatest/story/0,-6568208,00.html> (article available on the website for a limited time)

Press Association. Wednesday April 18, 2007 7:33 PM

Tackling climate change will be essential for Britain's future security, Home Secretary John Reid has warned.

Mr. Reid warned of the potentially "devastating" impact of mass movements of people fleeing the famine, droughts and flooding, which might be caused by unchecked global warming.

And he said that conflict over resources could become "the dominant cause of global insecurity" over the decades to come. Environmental security would be at the heart of the Government's agenda for the foreseeable future.

Mr. Reid's comments follow Foreign Secretary Margaret Beckett's warning to the United Nations Security Council on Tuesday that climate change was "a matter of international peace and security".

Wars could start over issues such as access to water and food, she said.

Speaking to the Young Fabians in London, Mr. Reid said: "There is great uncertainty about the geopolitical and human consequences of climate change and resource scarcity. Environmental security is not just of interest to the geographer or the demographer. It is an economic issue, a social issue, but also a security issue.

"Environmental security will be at the heart of what the Government does over the next 10 to 20 years both because of the huge economic costs involved if we fail to act and the potential for conflict over resources to be the dominant source of global insecurity.

"The impact in terms of population movement alone could be devastating. Tackling climate change is necessary to ensure security for the many."

But the Home Secretary said that the threat of global warming also presented the UK with an opportunity to become a world-leader in the technologies needed to halt it. "Our task is to convert this insecurity into opportunity," he said.

"Growth, science, progress and internationalism are agents of sustainable development, not its enemy. Improving energy efficiency, reducing waste and cutting emissions all stimulate jobs, innovation and investment in our economy. By committing to a sustainable future now we can become a global leader in the low carbon economy - creating potentially hundreds of thousands of jobs and billions of pounds of economic growth."

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Item 4. Growing Health Concerns over Electromagnetic Fields Might Trigger New Regulations

Industry ministry to regulate magnetic fields

<http://www.asahi.com/english/Herald-asahi/TKY200704260232.html> (not available anymore online)
The Asahi Shimbun, 04/26/2007

Amid growing health concerns over electromagnetic fields, the industry ministry plans to introduce regulations concerning magnetic fields around power-transmission cables and other electric facilities, sources said.

Regulations are in place on electric fields, but magnetic fields have been free from such rules.

The Ministry of Economy, Trade and Industry says a cause-and-effect relationship has yet to be established between electromagnetic fields and health problems such as childhood leukemia. But it decided to introduce the regulations partly because the World Health Organization is expected to soon compile environmental health standards regarding electromagnetic fields, the sources said.

A working group will be created in June under the Subcommittee on Electric Power Safety, part of the Advisory Committee for Natural Resources and Energy, which advises the industry minister.

The working group, comprising experts, electric industry officials and consumer group members, will work out the details, such as the electric facilities subject to the regulations and the methods to measure magnetic fields.

The panel will compile a report on the issue by autumn, and the industry ministry, after seeking public opinions, plans to revise technical standards listed under the Electric Utilities Industry Law, the sources said.

Concerns over electromagnetic fields are rising.

In March, a group of elementary school students and their guardians in Tottori asked the Tottori District Court for an injunction to suspend construction of a Chugoku Electric Power Co. transformer in an area beside the school.

An electric field is produced around objects that are electrically charged, while a magnetic field is generated in the vicinity of an electric current and magnetic force.

An electromagnetic field is a combination of the two.

No electric or magnetic field is produced when a television set is unplugged, for example. But when the TV is plugged in, the cord will be electrically charged, producing an electric field. And when the TV is turned on, the electric current inside the cable will generate a magnetic field as well.

Some overseas reports on the health conditions of residents living near power-transmission cables cited a correlation between the intensity of an electromagnetic field and the occurrence of childhood leukemia.

To prevent possible health problems, the International Commission on Non-Ionizing Radiation Protection, whose members comprise experts from member countries, compiled international standards on electromagnetic fields in residential environments in 1998.

The International Agency for Research on Cancer, an affiliate of the WHO, said in 2001 that extremely low-frequency magnetic fields, such as those produced by electric power facilities and home appliances, could be carcinogenic for humans.

Countries such as Germany and Italy have regulations for both electric and magnetic fields.

The industry ministry said Japanese electric power companies will not have to considerably refurbish existing facilities even if similar regulations are introduced in Japan.

The industry ministry in 1976 introduced regulations on electric fields produced by power transmission cables. Under the regulations, electric power companies are required to keep the intensity of electric fields under a certain level for areas under transmission cables, if the areas are accessible by anyone. (IHT/Asahi: April 26, 2007)

Item 6. Updates on Previously Identified Issues

6.5 Climate Change—Research Aspects

Sources—a more expanded list:

Climate Change 2007: Impacts, Adaptation and Vulnerability

<http://www.ipcc.ch/SPM6avr07.pdf>

UN Climate Change Impact Report: Poor Will Suffer Most

<http://www.ens-newswire.com/ens/apr2007/2007-04-06-01.asp>

Deep Pockets Needed for Climate Change Adaptation

<http://www.ens-newswire.com/ens/apr2007/2007-04-09-01.asp>

UN Experts Near Deal on Climate After Disputes

<http://www.planetark.com/dailynewsstory.cfm/newsid/41284/story.htm>

Wars of the world: how global warming puts 60 nations at risk

http://news.independent.co.uk/environment/climate_change/article2411376.ece

Briny future for vulnerable Malta

<http://news.bbc.co.uk/1/hi/sci/tech/6525069.stm>

Bangladesh: A nation in fear of drowning

http://news.independent.co.uk/environment/climate_change/article2458848.ece

Global Warming to Devastate Indian Coast – Expert

<http://www.planetark.com/dailynewsstory.cfm/newsid/41512/story.htm>

China Says Global Warming Threatens Development

<http://www.planetark.com/dailynewsstory.cfm/newsid/41506/story.htm>

Symposium: Indigenous Peoples and Climate Change. Thursday and Friday, 12-13 April 2007

Environmental Change Institute, University of Oxford

<http://www.eci.ox.ac.uk/news/events/070412conference.php>

Indigenous Peoples: the forgotten ‘polar bears’?

<http://www.admin.ox.ac.uk/po/news/2006-07/apr/17.shtml>

Indigenous Peoples on Climate Change Front Lines

<http://www.ens-newswire.com/ens/apr2007/2007-04-19-03.asp>

6.9 Nanotechnology Safety Issues—Details

UK Review Faults Governments' Nanotech Risk Assessment Plans

The UK's Council for Science and Technology (CST) has released a review of the government's response to the recommendations on nanotech risk studies made in the Royal Society's 2004 report. The review states that the government's efforts to provide support for such research are progressing too slowly. It equally criticizes the US and other countries for similar failures.

Sources:

Nanosciences and Nanotechnologies: A Review of Government's Progress on its Policy Commitments http://www.cst.gov.uk/cst/news/Files/nano_review.pdf

Calls for More Research (*sic*) into Potential Risks of Nanotechnology <http://www.azonano.com/news.asp?newsID=3912>

Nanomaterials' Biological Risks a Complex Problem

Two research projects at Rensselaer Polytechnic Institute, led by Asst. Prof. of Biomedical Engineering Deanna M. Thompson and Asst. Prof. of Earth and Environmental Sciences Anurag Sharma, have shown that the size, type, and dispersion of nanomaterials all may affect the materials' biological effects. Prof. Thompson's work dealt with the effect of nanotubes' degree of dispersion on their impact on cell growth, while Prof. Anurag's study was on long-duration effects on bacteria of nanotubes as compared with activated carbon or C60 fullerenes.

Sources:

When It Comes to Risk, Not All Nanomaterials Are Created Equal [http://news.rpi.edu/update.do?artcenterkey=2038&setappvar=page\(1\)](http://news.rpi.edu/update.do?artcenterkey=2038&setappvar=page(1))

When It Comes To Risk, Not All Nanomaterials Are Created Equal <http://www.sciencedaily.com/releases/2007/03/070326095826.htm>

Online Consultation on Nanomaterials Specification in EU Technical Guidance for Chemicals

According to an announcement from the EU, "The [European] Commission has ... launched a public consultation of the preliminary opinion of the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) on the appropriateness of the EU Technical Guidance Documents for chemicals in regard to nanomaterials. The online consultation, which will run until 23 May 2007, aims to gather feedback on proposed modifications to the Technical Guidance Documents and on needs for further research and development." The report notes that "... special characteristics of nanomaterials - potentially differing considerably from the conventional chemicals - have to be appropriately characterised. Furthermore, their toxicological behaviour and effects on health and the environment need to be assessed properly." Further, "The SCENIHR identifies issues requiring improvements in the technical guidance and methodologies, and proposes a staged strategy for the risk assessment of nanomaterials."

Source:

Public consultation on SCENIHR Opinion on The appropriateness of the risk assessment methodology in accordance with the Technical Guidance Documents for new and existing substances for assessing the risks of nanomaterials

http://ec.europa.eu/health/ph_risk/committees/04_scenihr/scenihr_cons_04_en.htm

New Nanotoxicology Journal Features Article on Airborne Nanomaterials

Informa Healthcare has started publication of a new quarterly journal, *Nanotoxicology*, in both online and print versions. Information about it can be found at

<http://www.informaworld.com/smpp/title~content=t716100760>

The inaugural issue features a 16-page article, "Assessing Exposure to Airborne Nanomaterials: Current Abilities and Future Requirements," written by Andrew Maynard, chief science advisor at the Wilson Center's Project on Emerging Nanotechnologies, and Robert Aitken, director of strategic consulting at the Institute of Occupational Medicine (Edinburgh, UK),

Sources:

Nanotoxicology <http://www.informaworld.com/smpp/title~content=t716100760>

New methods and tools needed to measure exposure to airborne nanomaterials

<http://www.physorg.com/news96032587.html>

Nanotech Standards Workshop Report Released (REPORT)

The Institute for Food and Agricultural Standards (IFAS) at Michigan State University has released a 32-page report, *An Issues Landscape for Nanotechnology Standards: Report of a Workshop*. According to the announcement, "The report discusses critical issues surrounding five standards themes affecting ...nanotechnologies ... (1) timing and standards-setting, (2) product vs. process standards, (3) international harmonization, (4) integration of operational standards, and (5) participation and transparency."

Sources:

An Issues Landscape For Nanotechnology Standards: Report of a Workshop

<http://ifas.msu.edu/NSWorkshopReport.pdf>

Assessing exposure to airborne nanomaterials: Current abilities and future requirements

<http://www.informaworld.com/smpp/content~content=a776419006~db=all~order=page>
(abstract)

Nanotech Products Meeting to Be Held in London

Nanotech Products Meeting to Be Held in London, 16-17 May—updated information is now available at www.nano.org.uk/events/ionevents.htm The meeting, *Nanotechnology – Products for Environmental Benefit*, will be held in London, 16-17 May 2007, by The Royal Society, Carlton House Terrace. The meeting will examine nanotechnologies that are described as “offering real environmental benefit, and will also review the findings of the recently published STOA report on the Role of Nanotechnology in Chemical Substitution.”