

In the session on 'Impact cratering from experiments and models', K. Wunerman (Humboldt University, Germany) discussed hydrocode (iSALE) modelling results to determine the effect of porosity on production of impact melts in sedimentary targets. The results indicate that pore spaces absorb shock waves causing higher temperatures at lower pressures. However, the possible role of water present in the pore spaces needs to be ex-

plored. The presentation by Gwendolyn Bart (University of Arizona, USA) looked at distinguishing distant secondary craters from primary craters of similar size by exploring the inverse relation between impact velocity of projectile and size of the ejected boulders. Secondary craters are produced by low-velocity projectiles and consequently produce larger boulders compared to a primary crater of the same size formed at much higher

velocities. Proper identification of primary craters is important to improve the precision of age estimation of planetary surfaces based on crater counting.

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## MEETING REPORT

### Biosafety and biosecurity of Asia\*

Biosafety and biosecurity have received tremendous public interest since the incident on 11 September 2001. The concept of the biosafety and biosecurity is also gaining momentum in Asia. Considering the growing importance of biosafety and biosecurity and the imperative need of the region and nations to protect and manage various institutions, national interests and natural resources, an International Conference on 'Biosafety and Biosecurity Asia 2007' (BBA-2007) was organized to look at the current status of development and technology in the field of biosafety and biosecurity and to develop a roadmap for a national plan on the same. BBA-2007 was held as a joint initiative of eleven agencies and the departments of the Malaysian Government, and Protamp Conferences Sdn Bhd.

The two-day conference mainly focused on current status of biosafety, emerging needs, biosecurity, immediate challenges and proven threats, life sciences and bioterrorism, and approaches in biosafety and biosecurity management. More than 400 delegates from various countries and international organizations worldwide participated in the conference. There were four sessions, two plenary lectures and 16 invited speakers from the US, UK, Australia, Singapore, Japan, Switzerland, Norway and Malaysia.

The Malaysian Prime Minister, Datuk Seri Abdullah Ahmad Badawi empha-

sized in his speech sent to the BBA-2007 conference, that Asia needs to develop effective mechanisms to detect rapidly any possible biosafety and biosecurity threats to protect nations in the region from possible bio-disasters. The PM had also mentioned that globalization in the area of biotechnology is increasingly intensifying the international trade of biotech products; and this trend in biotechnology industry is creating a situation in which a terrorist group could possibly acquire biological agents, equipment or weapons through various approaches. The PM mentioned that in this modern age, infectious diseases have ignored geographic and political boundaries. By emphasizing the scope of biosafety and biosecurity, he elaborated on the future challenges in biosafety and biosecurity. Finally, he urged the Asian countries and other countries around the world to put in place necessary measures or systems to strengthen their management and control on biological materials, agents and pathogens in various processes, from storage and usage to export.

In the first session on biosafety there were four invited papers. Nor Shahidah Khairullah (Infectious Diseases Research Centre, Malaysia) elaborated on emerging needs to avail biosafety and summarized issues such as management of biosafety, laboratory-acquired infections, laboratory accidents, SARS outbreaks in the region, bio-risks, and priorities related to protect employees and their families.

Identifying biosafety priorities in health and security, Terence Taylor (International Council for the Life Sciences,

USA) discussed the importance of collaboration at local, national, regional and international levels to meet biosafety challenges at the respective levels. He stated that advances in life sciences and associated technologies may be used for malign purposes. He also touched upon enhancement of biosafety by promoting development of standards using best practices, and codes of conduct.

Chua T. Mean (NUS, Singapore) presented an in-depth overview on regional biosafety challenges in Asia. He highlighted the risks associated with handling of hazardous agents and infectious diseases. He mentioned that the Asian region is the hotbed for incubation of several emerging diseases such as Nipah, SARS and Avian influenza. He also discussed issues related to laboratory and facility design, engineering, maintenance and administrative commands to counter key challenges of bio-contaminants in Asia.

Malcolm R. Dando (Department of Peace Studies, UK) spoke on the 'Conformance to the BTWC: an agenda for action for research institutes, universities and industries'. He reviewed the present state of awareness in the life sciences community in the context of the process of strengthening the biological and toxin weapons convention (BTWC), which clearly stated the importance of awareness raising and codes of conduct for life scientists for national implementation of the convention.

The second session of the conference focused on safety and security of food, agriculture industries, and life sciences and bioterrorism. Alan Edwards (Austra-

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\*A report on the International Conference on 'Biosafety and Biosecurity Asia 2007' held at PWTC, Kuala Lumpur, Malaysia during 21-22 May 2007.

lian Government Department of Agriculture, Fisheries and Forestry, Australia) elaborated on safety of food and agricultural products. He stated that safety of the food and agricultural products/industry is a global challenge and currently the primary aim of the terrorists is to cause maximum death and destruction using highly visible acts that terrorize, intimidate and destabilize national confidence by threatening social and economic well-being. Edwards also highlighted the sound intelligence assessments as a key factor in determining the threat and likelihood of any act of bioterrorism.

C. L. Chosewood (Office of Health and Safety, CDC, USA) presented an overview on the US centers' disease-control experience in preparing for and responding to domestic and international biological threats to public health. He elaborated both intentional and unintentional events that have had significant public health impact. He also discussed worker protection, environmental protection, safety of laboratory work, and challenges related to theft and misuse.

On Malaysia's experiences and outlook relating to life sciences and bioterrorism, A. Sulaiman and Samiran Sarijan (Nukleus 95 Hospital AT Malaysian Armed Forces, Malaysia) shared their experiences in the preparation of troops to counter the Nipah virus, SARS and Avian flu, which are similar to a bioterrorism attack. Emphasis was on overall preparedness to address the challenges posed by new and emerging infectious diseases.

Takeshi Kurata (National Institute of Infectious Disease, Japan) presented an overview on biosafety and biosecurity in Japan. He elaborated on bioterrorism by a cult group 'AUM' in the mid-1990s, and several other bioterror events that involved botulinus and anthrax. He also summarized about the amended law on biosecurity that would have taken effect on 1 June 2007; all hospitals, research institutes, universities and commercial laboratories have to implement it.

On a European approach to the controversies of life sciences, Peter Mani (Tecrisk Ltd, Switzerland) critically elaborated on divergences in national approaches and a view on how to pay increasing international attention to monitoring and control of natural, deliberate, unusual or terroristic outbreaks of diseases. He also high-

lighted that our deficiencies are not biological, but in policy and in scientific tools like quantitative risk analysis, modelling and simulation, and in decision theory.

G. J. Stewart (Office of Chemical and Biological Weapons Threat Reduction, USA) summarized the efforts that are underway in the US to ensure biosafety and biosecurity from a domestic perspective and highlighted some ongoing efforts that are underway at international level, including those of the World Health Organization and the Organization for Economic Cooperation and Development.

The third and fourth sessions discussed biosecurity and biosafety/biosecurity laws and policies in-depth. In a plenary talk, R. M. Salerno (Sandia National Laboratories, USA) gave an overview on laboratory biosecurity and the immediate challenges. He elaborated on factors involved in laboratory biosecurity and stated that protecting dangerous pathogens at the greatest risk of being used maliciously is a critical preventive measure. He also suggested that controlling biological expertise, information, equipment and technology would hinder the advance of science and harm the fight against infectious diseases.

R. V. Mathews (Department of Defense, Australia) delivered two talks. In the first talk he described the outcome of the two South East Asian Regional Biological Weapons Convention workshops, which focused on legislative requirements necessary for effective implementation of the Biological Weapons Convention and United Nations Security Council Resolution 1540, national measures to enhance the security of pathogens and toxins, and promotion of awareness. He also highlighted the roles of the scientific community and the importance of recognizing the overlap between science, law and policy. In the second presentation, he discussed bioterrorism using anthrax as a case study. The focus of his talk was on the importance of including anthrax as one of the pathogens to be regulated and monitored to raise the barriers on bioterrorism. The talk also covered the anthrax letter incidents in 2001, and lessons learnt from them.

On best practices of biosecurity models, C. L. Chosewood (Center for Disease Control and Prevention, USA) presented

an overview of the models currently followed by laboratories under the select agent programme of the US Department of Health and Human Services as administered by the CDC select agent programme and other existing programmes across the globe. Worker protection, environment protection, and safety of field responses and reference laboratory work were also highlighted in the talk.

Jusoh Sufian (Swiss National Center of Competence in Research, Switzerland) summarized the existing municipal and international biosafety laws and discussed how the existing international instruments (laws) could be used to tackle biosafety issues resulting from state and non-state actors alike. He also highlighted the need to rethink the national and international approaches towards biosafety laws to cover outstanding biosafety issues.

An in-depth overview on the Biorisk management was presented by Paul Huntly (Biorisk Global Leader, DNV, Norway), that covered some of the real issues faced by organizations in Asia. He highlighted the importance of getting the balance right between facility-oriented controls and basic safety and security management strategies. Huntly also underlined the need for internationally recognized standards and certification schemes and potential roles for regulatory bodies.

It was heartening to note that encouraging feedback was received from the participants. It was evident that the conference was fruitful in educating and creating awareness about latest developments in the area of biosafety and biosecurity.

Both biosafety and biosecurity are of prime importance, and no country can ignore them or remain isolated on the issues. Therefore, at local, national, regional and international levels, cooperation and collaborations are important to deal with the new challenges of biosafety and biosecurity, and the threats of bioterrorism. Nevertheless, as Asians we should not be left behind in this aspect.

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