



Association of Space Explorers

Committee on Near Earth Objects

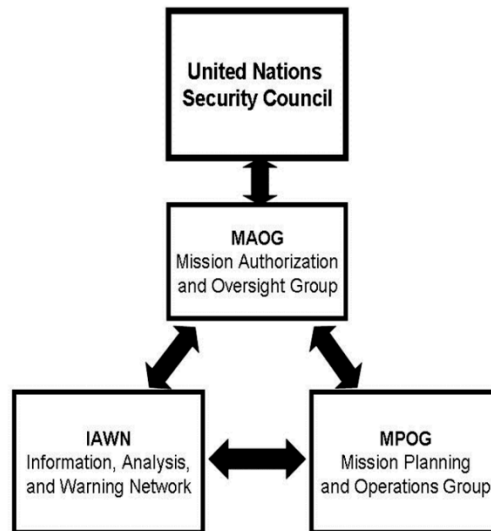
**Statement by the Association of Space Explorers
Forty-eighth Session of the United Nations COPUOS Scientific and Technical
Subcommittee
Vienna, Austria
15 February 2011**

Mr. Chairman, I thank you and the distinguished delegates and guests for this opportunity to bring you an Association of Space Explorers report on recent progress in confronting the global hazard due to Near-Earth Objects, or NEOs. The ASE is the global professional society of more than 375 space fliers, astronauts and cosmonauts, representing 35 nations.

Today I will review the proposed decision-making process submitted to the COPUOS in early 2009, summarize the results of the most recent workshop examining how one of the proposed international “functional groups” -- the Mission Planning and Operations Group -- dealing with hazardous NEOs might operate, and cite future opportunities for international cooperation in creating a global capability to prevent a future damaging asteroid or comet impact on Earth. We congratulate U.S.A’s NASA for its successful encounter with comet Tempel 1 early this morning. NASA furnished this comparison of Tempel 1 images taken by the Deep Impact spacecraft in 2005 and the Stardust-NEXT spacecraft this morning. These images and the spacecraft performance demonstrate our growing capability to explore small bodies and NEOs, and show how we might operate spacecraft around a hazardous NEO as part of a future deflection campaign.

2010 saw exciting successes in expanding our knowledge of NEOs, and we commend the respective space agencies on their progress. NASA’s Spaceguard survey found earlier this month an example of the many small asteroids which approach our Earth. Asteroid 2011 CQ11 was found by the Catalina Sky Survey just 14 hours before passing within 5500 km of Earth on Feb. 4. Although CQ11 was just a meter wide and would have been merely a spectacular fireball in our skies, it represents about a million small asteroids larger than some 30 m, capable of penetrating our atmosphere and causing damage on the ground. We have discovered only a fraction of one percent of those objects with a damage potential comparable to the 1908 Tunguska impact.

The prospect of such damaging impacts led ASE in 2007 to propose an international decision-making process for future threatening NEOs. Our Panel on Asteroid Threat Mitigation met in 2007-2008 to draft such a process, described in our ASE report, “Asteroid Threats: A Call for Global Response” (2008, see website: <http://space-explorers.org/committees/NEO/neo.htm>). The decision-making process is meant to be in place in advance of the discovery of a future threatening NEO. In considering a global response to the asteroid hazard, we described a set of three functional groups, to be endorsed by the United Nations, as shown in the following diagram.



The ASE report details the work of these functional entities:

The Information, Analysis, and Warning network searches for and catalogs NEOs, then analyzes their orbits for potential threats to Earth. The network would issue a warning of those NEOs that pose a serious collision hazard with Earth, enabling a timely international response. Elements of the IAWN are already in place through the NASA Spaceguard program, its JPL, the Italian/Spanish NEODyS program, the Minor Planet Center, and through the cooperation of existing and planned ground- and satellite-based observation systems.

The Mission Planning and Operations group would conduct detailed studies, in advance, of possible impact scenarios and planetary defense missions. Planning would include cost estimates and identification of research and technology objectives for the NEO programs of the various space agencies.

Finally, a proposed Mission Authorization and Oversight group, comprised by member states and approved by the United Nations at the Security Council level, would approve international planetary defense campaigns in response to a specific asteroid threat. This group would also work with the MPOG and IAWN to oversee the multi-year effort to successfully deflect a hazardous NEO.

The ASE report was formally submitted to COPUOS in 2009, and has formed a basis for the discussions of its NEO Working Group and its Action Team 14. Meetings of the Working Group and Action Team have as an objective the drafting of an eventual agreement on NEO decision-making for consideration and adoption by the General Assembly, assuring that the world community has in place an effective process for predicting and diverting a future asteroid collision. To further this goal, the ASE has helped co-sponsor and plan several workshops among member states' respective space agency representatives.

Our capable partners, shown here, convened a workshop to discuss the functions of the IAWN a year ago, in Mexico City, and another to discuss the responsibilities and functions of the MPOG in Darmstadt, Germany, last October.

The Executive Summary of the Mission Planning and Operations group workshop (available at the ASE website, <http://space-explorers.org/committees/neo/mpog.pdf>) summarized the role of this functional group.

The workshop participants reached five major findings concerning establishment and operation of an MPOG:

1. An MPOG-like group should be established by the world's space agencies
2. The MPOG should identify to space agencies the technical issues to be explored for planetary defense. This information would create synergies among international programs and activities, e.g. in planetary defense, science, and exploration
3. The MPOG should propose NEO research objectives to guide space agencies, addressing critical questions needed for effective NEO deflection strategies
4. The participants recognized the value of finding hazardous NEOs as early as possible:
 - a. to make timely identification of possible threats
 - b. to obtain precision tracking of NEO orbits to enable decision-making on possible deflection
 - c. to avert the costs of future deflection missions by ruling out collisions with Earth by threatening objects

Participants noted that early identification will be possible only with more advanced ground- and space-based systems. An example of this kind of search system is the proposed space-based IR telescope, possibly in a Venus-like orbit, to enable rapid surveys of the NEO population. Such a system could identify 90% of objects 140 m and larger in a period of 7-8 years.

The MPOG workshop was an important first step toward defining the role of a Mission Planning and Operations Group, just one of those necessary to deal comprehensively with NEO threats. This body should encourage the member states, and their space agencies, working through AT14 to approve the establishment of the IAWN and MPOG. With COPUOS endorsement, both bodies should get on with the active business of identifying asteroid hazards and planning for future deflection missions, supported by the space-faring countries and interested nations.

Formation of a Mission Authorization and Oversight group should be addressed by multi-lateral discussions among the member states' space agencies and representatives, with a view toward establishing authority for NEO decision-making and deflection efforts. These discussions should include both diplomatic and space agencies' technical representatives. Together with the MAOG discussions, member states should voluntarily collaborate in their NEO research programs and space missions to obtain the necessary technical data to inform the decision-making process, and enable development of effective planetary defense technologies and operations techniques. An early meeting to discuss the role of an MAOG should be convened by world space agencies.

The ASE notes the encouraging efforts within space agencies to organize their resources for planetary defense. Two ASE members co-chaired in 2010 the NASA Advisory Council ad hoc Task Force on Planetary Defense. That task force delivered its recommendations in October 2010; they were endorsed by the Advisory Council and sent to NASA's administrator, Gen. Charles Bolden.

The major recommendations stated that NASA should organize to conduct planetary defense, search for the NEO population that could threaten Earth, characterize a range of NEOs to confirm our ground-based estimates of composition and physical properties, develop the technology to respond to a threatening NEO, and exercise leadership in national and international planetary defense efforts. The full report can be found at the website shown: http://www.nasa.gov/pdf/490945main_10-10_TFPD.pdf

The Task Force, for example, recommended that NASA fly as soon as possible a space infrared telescope in a Venus-like orbit that can rapidly survey the NEO population. It also recommended that NASA investigate small, inexpensive search systems that detect 50 m-sized asteroids just a week before they approach or impact the Earth. Although these proposed systems cannot find distant NEOs, they have greater sky coverage than existing telescopes and thus can find about 60% of the smaller objects that closely approach or impact Earth, providing a few days or weeks of warning. [see www.fallingstar.com] Such a system would routinely detect objects like 2008 TC3, which struck the atmosphere over Sudan in October 2008.

The Task Force also recommended that future NEO exploration missions and technology development should lead directly to an international deflection demonstration mission, one that would change the orbit of a non-hazardous NEO as part of a mature capability to defend Earth from a collision.

In conclusion, the ASE recognizes the substantial progress made to date in dealing with the NEO hazard. Scientific discoveries have been accompanied by useful progress in outlining an international decision-making process under U.N. auspices. There is wide agreement that the global nature of the NEO hazard calls for an international response in terms of search and warning, mission planning, deflection authorization, and actual execution of a deflection campaign.

ASE respectfully calls on the COPUOS and the international community, especially its member states' space agencies, to approve the immediate activation of the IAWN and MPOG functional groups, getting on with the important business of NEO warning and deflection mission planning. A future damaging impact is a certainty unless we complete the process of developing, in advance, an effective decision-making strategy and mature deflection technologies. As our 2008 report states:

“We are no longer passive victims of the impact process. We cannot shirk the responsibility to prevent or mitigate impacts wherever possible.”

The Association of Space Explorers, with its global, space-tested membership, will assist future COPUOS action to meet this responsibility. We will work to educate policy makers, to communicate the seriousness of the asteroid hazard to the public, and to encourage an effective international response. The Association is tremendously excited to be involved in seizing this timely opportunity to safeguard Earth and benefit humanity.

Thank you, Mr. Chairman, for inviting me to address the distinguished delegates and guests today.

Thomas D. Jones, PhD

Chair, ASE Committee on Near-Earth Objects

[These remarks are available at our Association website, www.space-explorers.org]