

YOUTH INVOLVEMENT OF NEO WORKING GROUP (SGAC) IN DISASTER RESPONSE FOCUSING ON HUMAN AND ENVIRONMENT SECURITY

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Human and Environmental security from space activities is one of the most current critical topics discussed globally. The threats we face such as climate change, pollution, water scarcity, etc are not lightly to be taken. Dealing with these emerging issues is very critical and should be focused primarily however there are issues not so different from these that also need a good amount of attention such as a Near Earth Objects threat. Along with the increase in the discovery of these objects, the threat they pose to the Earth has increased with it. The percentage of a NEO collision is same as the percentage of a person being hit by a bus. This fact makes this issue a very important one as from previous knowledge of collisions (example: Tunguska event), even a small asteroid can cause massive damage to humans as well as the environment. These damages are not constricted to a city or a small part of a country, some collisions have a potential to wipe an entire country off this planet or worse an entire civilization. Research is carried out regarding the issue of damages caused by these objects from previous event which will help create a strategy to help prevent such large damage. The initial strategy will depend on prediction of a collision by tracking and recording its movements. The prediction will also indicate a position of collision. With this information and timeframe of the collision, a pre-planned solution can be obtained. Along with strategy planning, the countries have a responsibility to evacuate and protect its citizens. This should be taken into consideration when taking decision regarding human damage and survival rates. Survival system for human and environment should be put in place to provide help on decisions during a small scaled asteroid or space debris collision. Constructed series of legal parameters in case of response and mitigation have been developed by the Association of Space Explorers but these parameters should be internationally accepted and establish with the Space Law Treaty. This research will develop a strategic plan with considering legal parameters from different previous collisions to help prevent and survive the next one. It will also look into a constructive way to approach the space agencies and industry to accept these strategies.

1. OVERVIEW

Near-Earth Objects are small objects such as asteroids and comets within our Solar System that once in awhile form an orbit that brings them closer to Earth's orbit. These objects can in rare but frequently detected circumstances come very close to Earth's orbit which can change the course of their orbit or become a threat to Earth in terms of collision. When an object comes very close to Earth, it comes under the risk of entering Earth's atmosphere. Due to the re-entry conditions, most of the objects burn up due to air resistance. Many firms carry out research in detection and categorization of the NEO body, deflection systems against a threat of collision and global response strategy in case of a collision on course. In this paper, the main focus will be to bring all the aspects of the NEO threat into one platform and develop a strategy from detection to aftereffects of the collision on an international level. Public awareness is an important part of the NEO issue and will be addressed on a later stage. The strategy will look into (i) Collaborating different organizations work on detection in one database and tracking the objects with international collaboration; (ii) Global Response and awareness via public outreach and emergency evacuation systems in places in case of threat and (iii) Insurance and law policy to be followed in case of a collision and its after-effects. The secondary focus in the paper is to make the issue internationally recognized, the strategy should be lead on an international front for example a joint venture between the industrial firms and national agency firms. A lot of input

should be taken from young professional and student carrying out research in the similar area. Small SME's and consultancies should be able to participate. The above mentioned bodies should be allowed an opportunity contribute on a larger front. Public aware should be locally and internationally adopted. This paper will also enlist the activities carried out by NEO Working Group of Space Generation Advisory Council relating to public outreach.

2. INTRODUCTION

The Space Generation Advisory Council is a global non-governmental organisation that aims to represent student and young space professionals to the United Nations, States and space agencies. Space Generation is formed of students and young professionals interested in space issues and willing to work with space technology to tackle major issues concerning the world. Due to involvement in space issues, SGAC has a permanent observer status in the UN committee on the Peaceful uses of Outer Space (COPOUS). It is also a member of Action Team 14 at UN COPOUS that is working on developing a draft recommendation for an international response to the threat of NEO impact.

Neo Working Group of Space Generation Advisory Council focuses on carrying out competitions and outreach within the area of NEO. It also acts as a part of Action Team 14 at the UN COPOUS as mentioned before. Since 2008, NEO Working Group manages and runs Move An Asteroid annual competition that calls for technical, unique and innovative ideas from students and young professionals

international focusing on deflections of an asteroid, detection of an asteroid along with global response warning system. The variation of the competition changes everyone and focuses on certain or broad areas of NEOs.

Since 2009, NEO Working Group has been a part of Planetary Defence Conference organized by IAA that focuses on all part surrounding the NEO sector. The team contributes by judging the student competition that is run along with the conference. This year in May 2011, the NEO Working Group led a public event in Romania (the host of Planetary Defence Conference) that invited Experts on NEO area such as Rusty Schweickart, Dr. Dimitru Prunariu, Dr. Bill Ailor and Dr. Marian Piso. The public event attracted about 70 individuals from Bucharest, Romania young professionals and students alike. Since the success of the event, few members of the NEO working group decided to straighten out the legal aspects of a collision threat of a Near Earth Object.

Currently there is no legal framework in place for the international community should there be a threat of a Near Earth Object.

As with any issue related to the conduct of the international community in space matters, this needs to be taken to the United Nations Committee on the Peaceful Uses of Outer Space (UN COPUOS), which has played a crucial role in the making of the space law treaties. It consists of 69 member states as well as several NGOs and Intergovernmental Organisations that meet regularly to review, study, discuss and take action on space matters.

The ASE (Association of Space Explorers) is an international non-profit organisation of individuals who have flown in space. Its mission is to provide a forum for professional dialogue among individuals who have flown in space; support space science and exploration for the benefit of all, promote education in science and engineering, foster greater environmental awareness, and encourage international cooperation in the human exploration of space. [1]

The ASE Committee on Near Earth Objects was shaped to observe the workings regarding NEOs to be conveyed to important space organisations all around the globe. Apart from this aim, the committee presented a letter on the effects and impacts of NEO threats as well as the precautions to be taken place in case it happened sooner than later. The letter concludes that while natural disasters cause death and panic regionally or locally, a NEO impact can cause a global disaster especially when the globe is so unprepared for it. It emphasises that even though these impacts are not frequent, they can manage to be much larger than natural disasters resulting from global damage to total extinction, for example, the vanishing of dinosaurs. As the technology and science have been constantly developed, we have been able to gain deeper knowledge on these collisions and have developed advanced space technology to prepare, protect and survive. This letter suggests to develop laws and operational policies to preventing decision-making during any turn of events as well as if necessary would be considered operational to deflection of the NEO by necessary space power and propulsion procedure. 3

ASE has participated in a lot of conferences as well as workshops to create awareness on NEO deflection decision making.

SGAC is supporting ASE in their effort to create an international legal framework to respond to NEO threats.

As a member of the UN COPUOS Action Team 14 on the threat of Near Earth Objects, SGAC is involved in the ongoing discussions regarding the topic and offers support in finding solutions where feasible, e.g. with outreach activities towards students and young professionals on a global scale. This also involves the cooperation with other members, like ASE to proceed towards the common goal.