

CURRENT ACTIVITIES IN THE FIELD OF SSA: CONTRIBUTIONS BY THE MINISTRY OF DEFENSE  
AUSTRIA TO THE ONGOING DISCUSSION

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Space is not a peaceful place. Supernovae, pulsars, quasars expel harmful radiation, the Sun emits x-rays and powerful coronal mass ejections and numerous asteroids and comets pass by Earth every year. Most of them pass in safe distance, some come close and others collide with Earth. While the majority of these interactions lead to the entire burn up of the meteor, thereby producing a mere shooting star or a spectacular fireball, there are also these rare events of an impact leaving a significant trace on the Earth's surface. Typical examples are the Barringer crater in Arizona, the Steinheimer Becken in Germany and the infamous Chixculub crater in Mexico, which has been associated with the extinction of the dinosaurs, 65 million years ago.

Acknowledging the non-negligible risk and the potential high impact, various entities and countries have initiated Space Situational Awareness (SSA) programmes. One of these entities is the European Space Agency (ESA). Given its European dimension it has a strong influence on the national activities in Austria. ESA has started its SSA programme in 2009 and split it into three segments, which are: The Space Weather (SWE), the Near-Earth objects (NEO) and the Space surveillance and tracking (SST) segment. Today this programme is called the Space Safety Programme (S2P).

Bearing in mind that all military actors depend on space assets (satellite communication, satellite navigation and Earth observation), aim to track aircraft and other flying objects in the atmosphere and that recent developments in the field of aerospace technologies have (a) extended the reach of manned and unmanned aircraft to higher altitudes and velocities and that (b) the use of space bases assets (communication, navigation, weather forecast, Earth Observation) has become part of our daily lives it is obvious that SSA and particularly the SST and the NEO segment are becoming elements of high concern for the military forces.

For the Austrian Ministry of Defense, the first step is to increase the awareness for the numerous threats from the space environment to our digital society and to perform a general risk management for SSA. In order to achieve this, a common understanding for the relevant safety and security issues related to SSA and particular to NEO are at the core. Based on this common understanding, interdepartmental cooperation and information exchange could be extended with partners into the international domain, such as by making use of CSDP (Common Security and Defence Policy). Out of the many potential fields of activities, one of particular interest and which is currently evaluated, would be an early warning services, derived from a threat analysis in conjunction with Space Weather and NEO.

Civil protection and preventive measures against humanitarian disaster are within the Austrian Government the domain of the Ministry of Interior, or for smaller scale events, the responsibility of the regional governments. Despite the fact, that the Armed Forces are not in the primary role, there are still several key aspects for planetary defense, where the MoD (Ministry of Defense) can and should support the national activities.

The first and perhaps most critical task is the contribution to situational awareness. All capable national institutions contribute (or should contribute) permanently to a "national situation room" or "common operational picture". This "situation room" should not only focus on events happening on land and in the air, but might also encompass space and dangers that arise from outside our earth. The Armed Forces are especially trained in Command & Control and

how to establish a situational awareness center, including the “common picture”, briefings and the battle rhythms cycle, but also designated reporting. This knowledge of Command & Control within the MoD needs to be merged with the growing interest of the Armed Forces in the space domain. The result could be that one of the main contributors and operators of the space picture, as an integral part of the national situation room, is coming from the MoD.

In addition to the contribution in Situational Awareness, the Armed Forces have the knowledge to analyse and design various operation plans. Based on different scenarios, the officers and commands of the MoD are ideally placed to evaluate various contingency events. Tools like a command post exercise, including modern simulations, could bring all national stake holders together and confront them with a planetary defense scenario, for example based on an asteroid impact like discussed above. These “tabletop exercises” could help to define at the first stage the scenario (for example an asteroid impact) and the various assumptions governing this scenario, including probabilities and the international framework. In addition, these theoretical exercises will stimulate the creation of a network of decision makers and thereby facility common understanding as well as decision making in case of real danger. Finally, the results of the exercises might be a long list of “To Dos” for various national institutions and agencies.

It is quite certain, that the MoD will also receive a long list of “To Dos” out of these exercises. This could include measures to increasing the national resilience, provide emergency services (for example NBC, rescues or communications), but might also result in crisis Command & Control contributions. Again, the staff structure in the Armed Forces have been developed and optimized over decades and has been used as a blueprint for civil actors as well. The main feature is the structure based on staff officers’ group S1 to S6 and a common decision-making process. The staff officers grouping starts with S1 = personnel, includes S3 = operations, S4 = logistics and ends with S6 = communications. The decision-making cycle is also standardised and includes the situational update, the evaluation of options and structured orders. Especially in a crisis response operation, and an asteroid impact has to be treated like one, common structures and processes are the key for fast and successful decision-making.

Although the MoD will not be in the lead during a major disaster crisis, various tools of the Armed Forces could contribute to the national efforts: these including contribution to situational awareness, staff exercise and simulations, and the well-established Command & Control function. Furthermore, during a major national crisis, the Armed Forces will upon request support resilience measures and emergency services, wherever needed and possible.

Given its expertise, resilience and the dedicated capabilities that any of the Armed Forces have within their portfolio, the MoD is a key actor when it comes to planetary defense and the activities that are associated with it. Decades in supporting disaster mitigation activities on national and international level make all Armed Forces a valuable contributor to the worldwide planetary defense effort, which is by its very nature an element of national, regional and global concern, where all actors and stakeholders will have to work together to protect humanity from one of the biggest risks that it is confronted with.