



AUSTRALIA-UNITED STATES SPACE SITUATIONAL AWARENESS PARTNERSHIP FACT SHEET

What is Space Situational Awareness?

Space Situational Awareness (SSA) describes the monitoring and tracking of orbiting space-based objects such as satellites and debris using ground-based radar and optical stations.

SSA allows operators to track the orbits of satellites, predict and take action to avoid potential collisions between space objects such as manned spacecraft, the international space station, satellites, and debris, and monitor de-orbiting objects crashing to earth. SSA can also provide information on whether certain actions in space are deliberate or accidental, and attribute those actions.

SSA is increasingly important because more nations are using space and consequently space is becoming a more congested environment. Ultimately, SSA enables decision-makers to institute appropriate measures to manage vulnerabilities and mitigate threats – for example, by re-positioning satellites to avoid collisions with other objects.

How is Space Situational Awareness achieved?

The US Space Surveillance Network (SSN) is the principal system used to detect, track and identify objects orbiting earth. This Network is primarily a collection of ground-based radar and optical sensors, which track a variety of space objects including active and inactive satellites, spent rocket bodies, and other debris caused by fragmented fuel tanks, collisions and mission related activities.

Currently just over 16,000 objects are being tracked, ranging from large objects like the International Space Station and satellites, down to small pieces of debris of approximately 10 cm in diameter

Sensor observations are transmitted to the Joint Space Operations Center (JSpOC) at Vandenberg Air Force Base in California, where they are processed and incorporated into the master space catalogue. The space catalogue is used to predict each object's trajectory. These predictions are made available to the public via a website (www.space-track.org). Australia and other nations with interests in space utilise this system for their space situational awareness.

The US routinely predicts close approaches between the approximately 800 manoeuvrable satellites and nearby objects. If a potential collision is identified, the satellite operator(s) are informed so corrective action can be taken.

Why is access to space important?

Space-based capabilities are essential for many aspects of modern life, such as navigation, climate monitoring, natural disaster warning and communications, as well as underpinning key functions of national economies such as ATM and credit card transactions, and stock exchange activities.

Access to space-based capabilities is also critical for modern defence forces such as the ADF, including allowing precision navigation and targeting, space-based surveillance and intelligence gathering, and secure global communications.

However just as space is becoming an increasingly important environment to be able to utilise, such access is also progressively at risk.

Space is becoming increasingly congested due to the debris from over 50 years of space activities. This increases the risk from accidental collisions, such as the 2009 destruction of a US Iridium communications satellite from a collision with a defunct Russian satellite, which created further debris. Debris can also result from deliberate actions such as the 2007 Chinese Anti-Satellite (ASAT) test, which added over 6000 pieces of orbiting debris.

The growing number of countries and companies placing satellites in space is also adding to the congestion, particularly in certain orbits.

Why is Australia entering into an SSA Partnership with the US?

It is important that Australia take action to address current and emerging space-related vulnerabilities and threats. Space is critical to a variety of ADF systems as well as successful operations. It is also important to broader national security interests, including intelligence collection.

An increasingly congested space environment, including a growing amount of space debris, also creates risks to space assets. Incidents like the February 2009 collision between a US Iridium communications satellite and a defunct Russian Cosmos satellite demonstrate the importance of improving SSA in order to safeguard our access to space. That incident not only destroyed the Iridium satellite but increased space debris by approximately 10 per cent.

Current SSA data is incomplete and both Australia and the US recognise the importance of identifying opportunities to strengthen SSA. In particular, there is poor space surveillance coverage in the southern hemisphere which compromises global SSA. Because orbiting satellites and the threats against them are global in nature, SSA surveillance also needs to be global to provide timely and effective coverage.

The Partnership provides a framework for SSA cooperation. It will give Australia valuable opportunities to gain both expertise and capability in space situational awareness through access to US data, training and advice.

Does the Partnership form part of the White Paper initiatives?

The SSA Partnership contributes towards meeting the space capability priority agreed in the Defence White Paper 2009 to strengthen Australia's SSA and mission assurance capability.

The White Paper (paragraphs 9.99-9.100) identified that our ability to access space, gain the benefits of space-based systems and protect ourselves from foreign exploitation by space-based capabilities, such as intelligence satellites, are key requirements for our defence capabilities, and will play an increasingly important role in military operations.

The White Paper also identified an emerging threat from counter-space technologies such as anti-satellite missiles and signal jamming, and noted that protecting our assets from counter-space capabilities and from accidental damage caused by space debris will be critical.

New space capabilities were outlined by the Defence White Paper, including a cadre of space professionals within Defence, and exploring potential new capabilities such as a remote sensing satellite.

What does the SSA Partnership with the US involve?

The Partnership provides for enhanced and expanded defence space cooperation between Australia and the US including:

- exploring opportunities to establish and operate SSA sensors in Australia as joint facilities;
- mechanisms for better sharing of SSA information and technical data;
- developing trained Australia space specialists within Defence; and
- collaboration on science and technology, including potential development on complementary SSA technologies such as electro-optical systems.

More broadly, Defence will continue all of Australia's existing space cooperation with the US in accordance with the White Paper in the form of personnel exchanges and regular discussions on policy and intelligence.

Will the SSA Partnership contribute to the militarisation of space?

The primary purpose of SSA is to track space objects in order to predict potential collisions. This is supported by US analysis, monitoring and notification to all satellite users of such threats, and the freely-made provision of relevant data via the internet.

Australia, the US and other countries recognise the right of all nations to access space for peaceful purposes. SSA can support this, by predicting threats to such access, including non-deliberate threats such as accidental collisions between satellites or with debris, or deliberate interference (such as by other satellites or ground-based missiles).

SSA can be used to identify the behaviours of space assets, such as changes to courses or orbits. This can be used to determine if actions in space, such as collisions, are deliberate or accidental. SSA can also be used to attribute actions to specific assets or debris. As a result, SSA could also be used to monitor and verify any arms control agreements that could be developed for space.

Proposed SSA joint facilities in Australia

One of the opportunities that will be examined under the SSA Partnership will be the establishment of US Space Surveillance Network sensors in Australia. While no decision has been made on the establishment of such sensors, the placement of ground-based SSA radars in Australia could extend the coverage of the US Space Surveillance Network in our region. This would better enable the tracking and monitoring of space objects over our region, and allow for more accurate predictions of potential collisions or threats from debris.

Australia's preference is for any such sensors to be operated as joint facilities, and co-located with existing Defence facilities such as at Naval Communications Station Harold E Holt at Exmouth, Western Australia.

Any decisions on the establishment of such sensors would involve a detailed analysis of the proposal, including the costs associated with their establishment and support, and identifying and mitigating any risks and impacts such as security or environmental.

All activities under the Partnership, including any arrangements for joint facilities, will take place with the full knowledge and concurrence of the Australian Government. This is consistent with long-standing policy.