The ChronicleHerald

THE MILITARY AFFAIRS COLUMN BY TIM DUNNE

2 March 2013

Canadian military's 'eye in the sky'

The 10,000-tonne meteor that exploded over the Russian city of Chelabinsk on Feb. 15 released 500 kilotonnes of energy, shattering windows and injuring more than 1,000 people. But it was not the first projectile from space that has caused havoc.

The Soviet nuclear-powered surveillance satellite COSMOS 954 crashed in the Northwest Territories on Jan. 24, 1978, spreading radioactive material over 124,000 square kilometres in Canada's North, from Great Slave Lake to as far as northern Alberta and Saskatchewan.

The clean-up operation was co-ordinated between Canada and the United States in a military-led effort named "Operation Morning Light," which lasted until October 1978 and cost almost $15 million.

Since the launch of the USSR's Sputnik in 1957, the skies have become littered with active and inactive satellites, spent rocket bodies and an assortment of man-made space junk. This represents two forms of threats for us on the ground:

First, there is the danger that these objects will eventually fall to Earth, as COSMOS 954 did.

Second, Canada has billions of dollars in space-borne infrastructure, including telecommunications, weather tracking, search and rescue, global positioning systems and even television programming and Internet-based communications. These are systems that need to be protected from the 22,000 man-made objects that orbit the Earth.

Out of concern borne of the vulnerability of these critical systems, the Department of National Defence launched Sapphire, its first dedicated military satellite, last Monday to track objects in deep space, 6,000 to 40,000 kilometres above Earth, and provide "observational surveillance data."

Canada's Vice-Chief of the Defence Staff, Vice-Admiral Bruce Donaldson, noted, "The launch of Sapphire ensures the Canadian Armed Forces' (CAF) continued co-operation with other nations in the area of space surveillance. This milestone marks another important step in reducing the threat to our critical space capabilities."

It may come as a surprise that Canada's involvement with space-based systems began in 1958 with the United States' Harvest Moon program to provide information about objects in Earth orbit. Our involvement increased in 1961 with the transfer of a Baker-Nunn camera from the U.S. Air Force to the RCAF, where it was installed at RCAF Station Cold Lake, Alta. The increase in the number of satellites during the next 10 years prompted the installation of a second Baker-Nunn camera and space object identification telescope at St. Margarets, N.B.

These high-resolution cameras were capable of photographing orbiting objects as small as a basketball, which may not be particularly noteworthy today, but in the 1950s and ’60s, this was the pinnacle of space-tracking technology. The United States’ Ground-Based Electro-Optical Deep Space Surveillance (GEODSS) system, capable of tracking small objects more than 32,000 kilometres in space, relegated the Baker-Nunn cameras to irrelevance. They were decommissioned in 1992.

Our activities in space continued with the development of the Search and Rescue Satellite (SARSAT) in co-operation with the U.S., France and former Soviet Union. This system became operational in 1985 and has grown to 43 participating nations. According to the Paris-based Centre National d’Etudes Spatiales, France’s space policy agency, SARSAT saves nearly 2,000 lives each year.

The Sapphire satellite is the CAF’s unveiling of the Canadian Space Surveillance System, a major component of our Surveillance of Space Project to protect Canadian-owned orbiting infrastructure and our territory from the growing collection of debris currently circling the Earth.

Other than Chris Hadfield’s appointment at the International Space Station and the space shuttle’s Canadarm, Canadians are generally oblivious to the importance of space-based systems to their everyday lives and to the fact that Canada has been involved in space for decades.

The CAF’s Director General Space is working with projects that include Protected Military Satellite Communications, the Mercury Global project to provide military wideband satellite communications, Low Earth Orbit search and rescue satellite repeaters, and the Medium Earth Orbit satellite repeater.

Canada is massive, at about 10 million square kilometres, second only to Russia’s 17 million square kilometres. We have only 3.3 Canadians per square kilometre and we have the sixth highest human development index, at 94.4, according to the United Nations. Business Insider notes we have $1 trillion in metal and ore resources, fourth behind South Africa, Russia and Australia; and we hold the world’s second-largest oil reserves, just after Saudi Arabia, according to Dow Jones Newswires writer Campion Walsh.

As the polar ice cap diminishes, leaving our resource-rich North open to exploitation, our space-based systems will economically preserve our sovereignty, protect our resources and pinpoint where we need to deploy our military and law-enforcement agencies. This country has a lot worth protecting.