



# PREVENTING OIL SPILLS

## CASE STUDY



**INMARSAT GLOBAL GOVERNMENT  
COMMUNICATIONS MADE CERTAIN**

This case study is over 5 years old. Whilst the specific hardware mentioned may have been superseded with more advanced models, it proves the longevity and capability of Inmarsat's L-band services. With proven technology and global coverage, you can rely on our services for [#communicationsmadecertain](#)

# NATIONAL AERIAL SURVEILLANCE PROGRAM

**Transport Canada's Marine Program is the lead federal department responsible for preventing pollution from ships transiting waters under Canadian jurisdiction. Through its National Aerial Surveillance Program (NASP), the surveillance aircraft keep a watchful eye over marine traffic and their presence also acts as a deterrent by discouraging illegal discharges of pollution at sea.**

The NASP uses the SwiftBroadband multi-channel service, through Inmarsat Distribution Partner, SatCom Direct, for its daily surveillance operations in order to communicate with government officials and/or first responders. Internationally, aerial surveillance is widely adopted and considered to be the most effective method for the detection of oil spills.

Inmarsat satellite services are used to send images and screen captures, in near real time as well as streaming video in real time. The service is also used for flight-following and tracking of aircraft and to send data—

received from the Automatic Identification System of ships in the area—to Canada's Marine Security Operations Centres in near-real time (transmitted every 15 minutes during the flight). The Inmarsat SwiftBroadband service enables the NASP aircrew to communicate with government officials and first responders on the ground.

Depending on the nature of the incident, imagery is sent from the aircraft to responders, investigators, and command centres, to expedite the response to the incident. The Inmarsat service is essential in providing situational awareness

to Transport Canada senior government officials and to other government departments as well. Surveillance officers in the aircraft are electronically enabled to transmit information that has been observed in near real time. In the case of an incident such as an oil spill, the data observed by the surveillance officers is transmitted via email to senior management and first responders. Live video stream is also a popular means of providing situational awareness during critical situations to enable accurate and timely decision making.



# STRATEGICALLY LOCATED SURVEILLANCE AIRCRAFT

The NASP has three surveillance aircraft which are strategically located across Canada for effective monitoring and rapid response to incidents.

They are all equipped with Maritime Surveillance Systems (MSS6000), which were all purchased from the Swedish Space Corporation, now called S&T Airborne Systems. This state-of-the-art remote sensing equipment includes the following:

## **INMARSAT SWIFTBROADBAND SATELLITE COMMUNICATIONS SYSTEM.**

This permits the flight crews to stream video, or to transmit data they collect during patrols, to ground crews in real time. Consequently, incident command teams located in command centres can view the same image as the flight crew at the same time. (Communication to the ground)

## **SIDE LOOKING AIRBORNE RADAR (SLAR).**

This helps detect irregularities on the ocean's surface— even when visibility is poor or during the night. The SLAR extends the aircraft's sight from two nautical miles (surveillance with

the naked eye) to 45 nautical miles on each side. (Anomaly detection)

## **INFRARED - ULTRAVIOLET LINE SCANNER (IRUV).**

This helps experts analyse oil slicks and provides high-resolution imagery of marine pollution incidents. It can also observe temperature differences on the ocean surface and map out spills of oil and other substances. (Oil analysis)

## **ELECTRO-OPTICAL INFRARED CAMERA SYSTEM (EOIR).**

This is also known as an MX15; it helps aircrews identify ships and collect evidence over a wide range—even in reduced visibility. (Source identification)

## **AUTOMATIC IDENTIFICATION SYSTEM (AIS).**

This provides vessel identity and voyage information, which helps aircrews digitally link the vessels with positions on the map. (Evidence support)

## **GEO-CODED DIGITAL CAMERA SYSTEM.**

These cameras enable the aircrews to take digital photos and videos that can be used as evidence. All pictures and video are geo-tagged with GPS data such as date, time, longitude and latitude. Transport Canada can use these photographs and videos as evidence in court. (Evidence support)




Canada's aerial surveillance capability is a powerful deterrent against illegal discharges.

As the NASP aircraft can patrol at an altitude similar to commercial aircraft, vessels are often unaware that they are being covertly tracked.

Alternatively, the aircraft can also fly at much lower altitudes, thus signalling their presence to ships transiting below and deterring unlawful activities.

Evidence gathered by the NASP is used to enforce provisions of Canadian legislation applicable to illegal discharges from ships.



**"The use of the Inmarsat satellite communications has been proven to be an invaluable asset to the NASP. It allows the aircrews to have immediate/direct contact with government officials and/or first responders, which greatly aids in the response to an incident."**

**Louis Armstrong,**  
Chief, Intelligence, Surveillance and  
Reconnaissance at Transport Canada.

**380** MILLION GALLONS  
OF OIL PER YEAR  
ENTER OUR  
OCEANS

**55%** OF ILLEGAL  
DUMPING OF FUEL  
OCCURS BY SHIPS  
IN TRANSIT

**50%** OF LARGE SPILLS  
OCCURRED WHILE  
VESSELS WERE  
UNDERWAY IN  
OPEN WATER OVER  
THE LAST 40 YEARS

Statistics sourced from:  
OIL IN OUR OCEANS: The Xerces Society, Blackburn,  
Mazzacano, Fallon, Hoffman Black, 2014

# SWIFTBROADBAND

SwiftBroadband is an IP-based packet switched service that provides an “always-on” data connection through single or multi-channel systems.

## DATA

In Standard IP mode, the system provides a service of up to 432Kbps per channel to the aircraft. SwiftBroadband can also provide a pre-determined quality of service through dynamically-assigned streaming classes, which can be combined to achieve higher data throughput or through the X-Stream service. With the introduction of SwiftBroadband HDR, customers can expect to achieve speeds of up to 650 Kbps.

Combined with the use of performance-enhancing technologies such as data compression, IP and application optimization, SwiftBroadband is your ultimate solution. For backward compatibility, SwiftBroadband can also provide a circuit-switched ISDN service. If more bandwidth is needed, an operator can add equipment to allow concurrent use of up to four SwiftBroadband channels.

## VOICE

SwiftBroadband can provide a high-quality voice service with the full functionality of terrestrial fixed phone services. Each SwiftBroadband channel provides a circuit-switched voice channel to the aircraft. All voice services can be used in parallel with a combination of packet-switched data services.

## SECURE COMMUNICATIONS

SwiftBroadband supports high-assurance applications, including NSA Type-1 and NATO secret encryption systems providing remote mobile access to classified networks – STUIII/IIb, STE, KIV-7, Brent and HAIFE devices including KG-175 TACLANE, KG-235 Sectéra, KG-250 Altasec, subject to verification testing.

## MAXIMISING FLIGHT HOURS AND EFFECTIVENESS OF SORTIES

Aviation assets are costly to run and maintain yet offer the most cost effective means of surveillance. The availability of live situational awareness through the use of the Inmarsat SwiftBroadband system means that far greater efficiencies can be gained from every flying hour.



During the fiscal year 2014/2015, the NASP aircraft flew a total of 3,842 patrol hours across Canada

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