



MARITIME CASE STUDIES



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 Whilst the specific hardware mentioned may have been superseded with more advanced models, it proves the longevity and capability of Inmarsat's L-band services.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](#)



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RSV AURORA AUSTRALIS

Inmarsat's satellite communications are a crucial part of Australia's ocean going Antarctic exploration efforts

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Interest in exploring the Antarctic for scientific purposes dates back to 1842, when the first call for scientific exploration of the South Pole appeared in a Tasmanian science journal.

By 1886, the Australian Antarctic Exploration Committee had been established to investigate, among other things, the creation of research stations and the use of steam-powered ships to penetrate areas inaccessible to sailing vessels. Today, the Australian Antarctic Division (AAD) is responsible for an on-going programme of experimentation and scientific explorations aimed at better understanding the frozen continent.

AAD is responsible for administering the Australia's Antarctic Program (AAP), which was established in 1947 and counts amongst its membership Australian government agencies involved with Antarctic research, as well as non-governmental organisations, including universities and research institutions, both Australian and foreign.

Today, Australia administers three Antarctic stations, Casey, Davis and Mawson, and maintains a permanent sub-antarctic base on Macquarie Island, situated some 1,500kms south of Tasmania.

AAD conducts an extensive marine science program using its own

icebreaker ship; the RSV Aurora Australis. Affectionately known as the "orange roughy" because of the bright colour covering the entire ship, the Aurora Australis is a crucial part of the AAD's work. This vessel has been in service since it was launched in 1989, having been purpose built for the AAD. She is a 3,900 tonne icebreaker capable of penetrating 1.2 metre thick ice at a speed of 2 knots (approximately 3.7 kilometres per hour), carrying 1,600 cubic metres of general cargo plus 40 containers, and accommodating 133 people including the crew. The Aurora Australis can also house three helicopters, which fly from the dedicated helicopter deck at the rear of the vessel.

The ship is well equipped for marine science research with a commercial sized trawl deck, and a commercial hydro-acoustic system for the assessment of marine organisms. It also has a general purpose wet lab for processing net samples, a hydrographic lab, fish freezer, meteorological lab, five multi-purpose laboratories, a photographic dark room and a scientific work room.

While out at sea, the Aurora Australis depends on satellite communication services provided by Inmarsat to stay in touch with AAD.

FLEETBROADBAND 500

Dual FleetBroadband (FB) 500 terminals provide the Aurora Australis crew and expedition members with a Voice Over IP (VOIP) IAX1 link to AAD's head office (HO), a direct dial phone system via an IP GRE data tunnel2, a matching IP GRE data tunnel to AAD HO for data transfer and SIP3 access to the FB terminal for external voice calls.

The Aurora Australis is also equipped with an Inmarsat C Global Maritime Distress Safety System (GMDSS) and Inmarsat Fleet F77 system for ship operations, although all crew email, weather and ice information go through the FB terminals.

The FB data services are used for a great many day-to-day tasks, including the transfer of emails (by 'store and forward' compressed file transfer in both directions), scientific data, pictures from three webcams on the ship, position reports from the vessel, as well as daily active directory domain controller synchronisation (to keep computers up to date), 'syncing' of the call records database, and GPS positions to ship from the helicopter(s) for in-flight tracking.

Scientists on board the ship also routinely expect to carry on their normal work while onboard - staying in touch with colleagues in their home institutes, managing their long-term experiments, and carrying

out whatever on-going tasks need to be maintained - in addition to running their shipboard research. This adds to the need for communication and data exchange. Most data transfers occur via email, which is transferred by AAD's compressed email transfer system every 15 minutes. The onboard email server services about 120 scientists and crew. Data transferred via email includes official and personal emails, as well as operational and scientific attachments including spread sheets, documents and information in other formats.

Communication is also crucial to the day-to-day operations of the ship itself. Satellite imagery for ice navigation using the polarview system, supplemented by images from modis and radarsat systems, are also transferred to the ship. The ice data supplied through the polarview system and other satellite imagery is critical to navigating the ship.

A Bureau of Meteorology forecaster is stationed onboard to provide forecasts for ship and helicopter operations. To support this function, the vessel receives daily updates of Bureau of Meteorology model data. The ship also receives data from the global Argo network of ocean probes.

Aurora Australis transfers basic "underway" scientific data every 15 minutes to the AAD data centre,

together with data files from particular instruments for integrity checking. And, of course, video footage and other media information are transmitted back to AAD for dissemination.

With the advent of reliable satellite communications. Now the crew and scientists onboard the Aurora Australis have better access to AAD HO for fault-finding help and support, access to software updates of the precision instruments being used and accurate weather and ice forecasts for better navigation and safety. Senior scientists are able to go on these expeditions because they can stay in touch with their home institutes and their work, relieving them of concerns over whether their on-going experiments and other work will grind to a halt. In addition, email adds a level of personal contact with family and friends that helps to fight off the isolation of being at the South Pole.

The satellite communications systems on board the Aurora Australis provide the vessel with reliable communications, even in one of the most remote, pristine, unexplored wildernesses of the world. The 'Orange Roughy', 20 years on, is still carrying scientists to the South Pole, and helping efforts to better understand our planet through scientific exploration. Crew and passengers have better access

to regular email traffic and phone calls. But more importantly, satellite communications have improved navigation for the ship, offered better safety for the expeditions, and made it possible for more constant communication with AAD HO.

Operating the Aurora Australis in the challenging polar environment has always been a challenge, but access to satellite communications makes it easier and safer and allows a higher level of collaboration since scientific data can more easily be sent back and forth. The work of the Australian Antarctic Division, and these important Antarctic missions, might not be possible without these communications.





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AMSA

AUSTRALIAN MARITIME SAFETY AUTHORITY



HELPING THE MV AKADEMIK
SHOKALSKIY OUT OF HOT WATER

BREAKING THE ICE WITH SATELLITE COMMUNICATIONS



Not one of the 74 passengers and crew aboard the Russian ship MV Akademik Shokalskiy would have dreamt of the frigid fortnight they were about to endure when they set sail for Antarctica's Commonwealth Bay late 2013.

They would have been prepared for the violent westerly winds that would have assaulted them as they navigated the Southern Ocean, dubbed the Roaring Forties, Furious Fifties and Screaming Sixties. These fierce winds travel the entire circumference of the globe, unhindered by land, allowing them to build to damaging speeds along the corresponding latitudes.

They definitely would have been equipped for sub-zero temperatures. It is no secret that the southern-most continent is the coldest on the planet – almost completely covered in ice and with temperatures that can drop to -89C.

Being equipped for the unavoidable is an easy thing to do. On the other hand, being prepared for two weeks isolated from the rest of the world,

cut-off from help and threatened by ever-encroaching pack-ice, is much harder to foresee... But when the ship became stranded in the Antarctic on Christmas Day, the crew was ready.

Five ships were involved in the rescue operation: the Akademik Shokalskiy itself, the Chinese Xue Long (Snow Dragon), the French L'Astrolabe, the Australian Aurora Australis and the Polar Star from the US. The logistics

involved in organising some of the largest ice-going ships, in one of the most remote regions on the planet, could only be described as staggering.

Clear and constant communication would be absolutely vital for the operation to succeed.

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WEEKS
THE AKADEMIK
SHOKALSKIY TRAPPED IN
PACK ICE FROM 25-12-13
TO 2-1-14

5
THE NUMBER OF SHIPS
INCLUDED IN THE RESCUE
OPERATION

74
THE NUMBER OF
PASSENGERS AND CREW
STRANDED BY PACK ICE OFF
ANTARCTICA

AS IT HAPPENED



Shortly after 7:20am on Christmas Day, the Australian Maritime Safety Authority (AMSA) received a distress signal – a vessel was beset by pack-ice (ice that is too thick to break through) off the coast of Antarctica.

AMSA assumed coordination of the rescue operation after being notified by the Falmouth Maritime Rescue Coordination Centre in the UK.

AMSA provides search and rescue services to vessels navigating Australian waters. With the organisation's search and rescue region amounting to one tenth of the earth's surface, Alan Lloyd, AMSA Search and Rescue Operations Manager, said there were a number of issues that complicated the operation before it even started.

"The size of our region poses some significant challenges," Lloyd said. "In the case of the Antarctic rescue, it happened in a remote location where there weren't a lot of ships. In fact, the closest was still days away."

Lloyd said given the nearest ships were at least two days from the stricken research vessel, timing was

critical and any delay could be costly. "Using Inmarsat-C, part of the Global Maritime Distress and Safety System (GMDSS), we were able to alert ships in the vicinity of the vessel in distress. We were not only able to notify them of the situation and ask for help, but we could also send the identity, position, course, speed and cargo of the ship," he said.

The Inmarsat-C is a two-way data service used to monitor and track maritime activity around the world due to its use in the GMDSS and offers data transfer, e-mail, SMS, telex, remote monitoring, position reporting, electronic chart and real-time weather updates, maritime safety information (MSI) and security services to ships around the world. The service is also available for land mobile and aeronautical use.

Meanwhile, the 74 people on board

– 50 scientists and volunteers, two journalists and 22 Russian crew members – could do nothing but watch as south-westerly winds packed ice floes even tighter against the ship.

Lloyd said that while coordinating rescue ships, AMSA's Rescue Coordination Centre (RCC) was also in constant contact with the stranded vessel.

"The Antarctic rescue clearly demonstrated the value of satcom in search and rescue. RCC Australia was able to communicate regularly with the vessel beset by ice and the vessels that responded to the distress situation," he said.

"GMDSS allowed RCC Australia to manage the incident. We were able to alert nearby ships and assist in coordinating the search and rescue operation with minimum delay, as

well as tracking the positions of the responding vessels in relation to the location of Akademik Shokalskiy."

Communication between vessels became even more essential when rescue ships also had difficulties navigating toward the Russian ship through the pack ice. While attempting to rescue the Russian ship, Chinese icebreaker Xue Long was unable to navigate through the ice any closer than 6 nautical miles. Despite being unable to free the Akademik Shokalskiy, the captain of the Chinese vessel advised AMSA its situation was not dire and that they would remain in their current position to assist the Akademik Shokalskiy as required. The Snow Dragon had food supplies for several weeks and could support those stranded on the Russian passenger ship.

NEW TECH, NEW TACTICS



"Access to mobile and cost-effective satellite communications has reduced the information and coordination gap. AMSA moved from relying on facsimile transfer of incident details and briefing information to having internet access to incident maps and task briefings as well as the digital tracking of rescue assets - whether maritime, aviation or land."

Alan Lloyd, AMSA Search and Rescue Operations Manager

Lloyd said that if it wasn't for recent advances in satellite communications, the international rescue mission could have ended differently.

He said the technology wasn't exclusive to large vessels and also allowed for individual rescuers to maintain the vital link between themselves and the Rescue Coordination Centre.

"In responding to search and rescue, maritime casualty and pollution incidents, we send staff out into the field to assist and coordinate remediation efforts," he said. "Our personnel are able to maintain real-time linkages to AMSA's rescue coordination centre by voice and data via a number of technologies including Broadband Global Area Network (BGAN) and personal mobile satellite phones. This constant and reliable communication allows incident responses to be undertaken in an effective and timely manner, especially in remote locations."

HOME SWEET HOME

A helicopter on board the Xue Long was used to airlift passengers from the Shokalskiy before they were transferred to the waiting Aurora Australis to begin the long voyage home. The 22 crewmen aboard the Russian ship decided to wait until the ice pack relented which broke free a week later.

Lloyd said throughout the ordeal there was one thing above all else that not only helped rescue efforts, but also the morale of those stranded - communication.

He said anyone planning a sea voyage must be prepared for absolutely everything.

"I would recommend distress beacons and access to a two-way communication device (voice and/or text) suitable for the area you're operating in. During a crisis, access to reliable and bullet-proof distress equipment allows anyone requiring assistance to communicate with rescuers.

"Not only this, but it also allows friends and family to be made aware of your situation."

The MV Akademik Shokalskiy and other vessels can rest assured that authorities like AMSA are investing in state-of-the-art satellite technology, provided by Inmarsat, to maintain a Global Maritime Distress and Safety System which enables rapid response and integrated communication to quickly reach stricken vessels when in need.

INMARSAT C SERVICE



Inmarsat C provides two-way data and messaging communication services to and from virtually anywhere in the world. The low-cost terminals and antennas are small enough to be fitted to any size of ship.

SAFETY COMMUNICATIONS USING INMARSAT C

Inmarsat C is two-way store and forward communication system that can handle data and messages up to 32kb in length, transmitted in data packets in ship-to-shore, shore-to-ship and ship-to-ship direction. Message length for Inmarsat Mini C terminals may be smaller.

The equipment comprises a small omnidirectional antenna, compact transceiver (transmitter and receiver), messaging unit and, if GMDSS-compliant or with a distress function, a dedicated distress button to activate an alert. Inmarsat Mini C terminals are the smallest models, with some incorporating the antenna and transceiver in the same above deck unit and, depending on the model, supporting the same communication services as Inmarsat C terminals.

All modern Inmarsat C and Mini C terminals have an integrated Global Navigational Satellite Services (GNSS) receiver for an automatic position update on the terminal which is used for distress alerting (ship's position, course and speed), ship's position data reporting applications and selective reception of EGC SafetyNET messages.

Distress alerts and distress priority messages transmitted via the Inmarsat C system are routed through a land earth station to a Maritime Rescue Co-ordination Centre (MRCC).

DISTRESS ALERTING

Distress alerting is a mandatory service on SOLAS compliant maritime Inmarsat C and Mini C terminals and on some non-SOLAS models too.

When a distress (SOS) button is pressed, a short preformatted data packet is transmitted with priority from the terminal to an addressed Land Earth Station (LES) that automatically routes it to an associated Maritime Rescue Coordination Centre (MRCC). The distress alert contains information on the terminal's ID, addressed LES, date/time of alert, ship's position, course, speed, time of last position update, nature of distress, flag and speed update.

When a distress alert is received by an MRCC, it will establish communication with the ship to organise search and rescue (SAR) services that may be required.

INMARSAT C DATA REPORTING AND POLLING SERVICES

The data reporting service allows Inmarsat C and Mini C mobile earth stations (MES) to send short data reports, up to four data packets, to a shore-based authority or operational centre.

A typical data report could be a ship's position report, sailing plan, or fisheries catch report – any data that can be encoded into data packets for the Inmarsat C system. One of the services to use data reporting and polling communication protocol is Long Range Identification and Tracking (LRIT) of ships as required by IMO.

Data reports may be sent from ships regularly, randomly or in response to a polling command from a shore-based operational centre. A typical polling command may instruct an MES to send a data report immediately or at defined start time with particular repetition intervals, stop sending reports or to perform a defined task.

To transmit a data report, the MES should have Data Network ID (DNID) and Member number downloaded using polling command. Both are stored in the terminal's memory.

OPERATION ATALANTA



**INMARSAT AIDING THE GLOBAL
BATTLE AGAINST PIRACY**

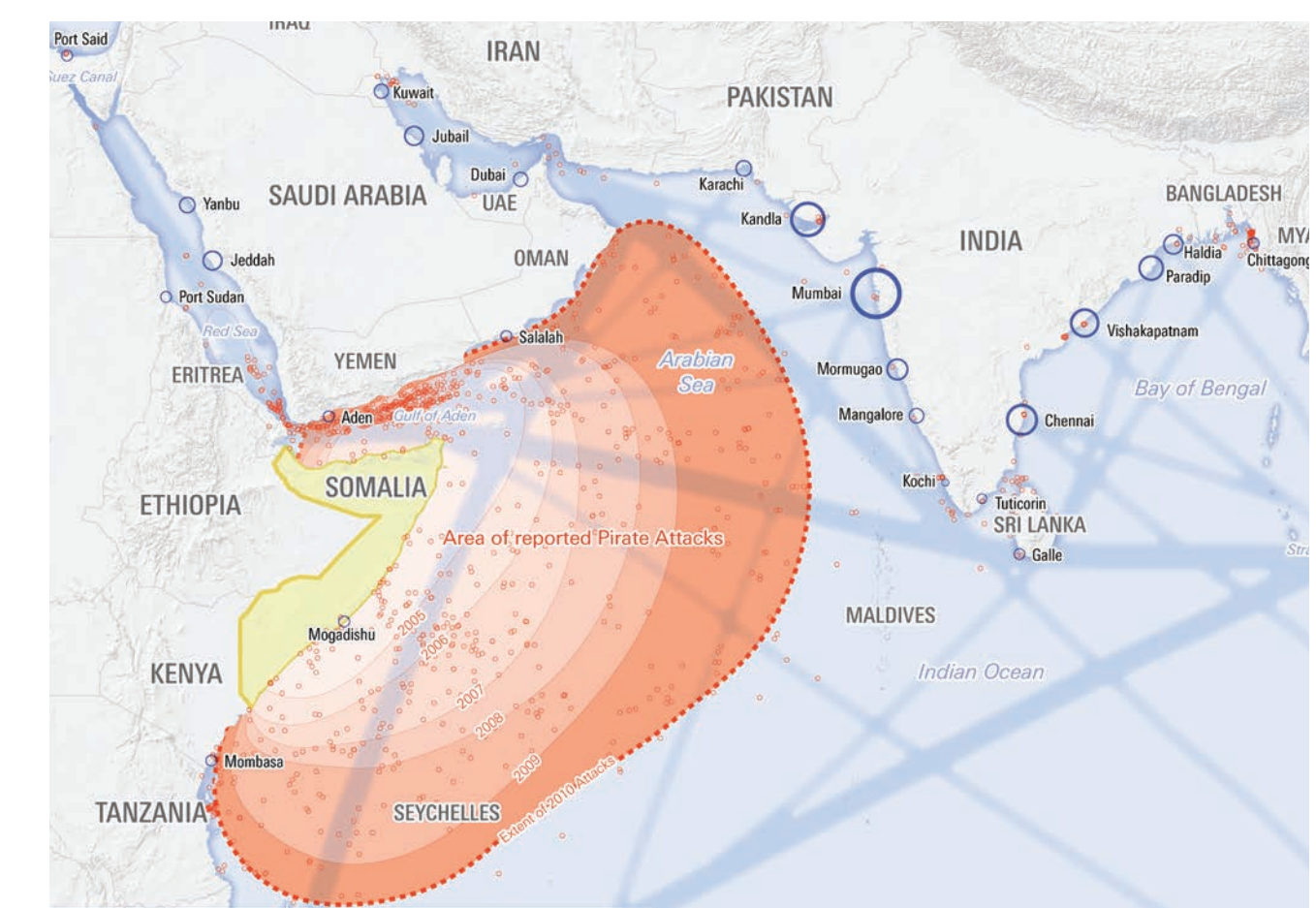


ATALANTA

Created under the UN Security Council resolutions 1814, 1816 and 1846, Operation Atalanta covers a 2,000,000 square nautical mile area across the southern Red Sea, the Gulf of Aden, most of the Indian Ocean including Seychelles, Mauritius and Comoros, and the coastal territory of Somalia, including its territorial and internal waters.

OPERATION ATALANTA OBJECTIVES

1. Protect vessels of the World Food Programme (WFP), African Union Mission in Somalia (AMISOM) and other vulnerable vessels in order to secure food supplies for over 1,600,000 Somalis.
2. Deter and disrupt piracy and armed robbery at sea.
3. Monitor fishing activities off the coast of Somalia.



COLOMBIA: A SECURITY SUCCESS STORY



Colombia's success in countering security challenges has led to greater international collaboration as well as the export of Colombian security expertise to over 60 nations across the world.

As part of its integration with international peacekeeping operations, Colombian Ocean Patrol Vessel (OPV) ARC 7 DE AGOSTO arrived in the Gulf of Aden on 8 August 2015, as part of Operation Atalanta. This collaborative counter-piracy operation aimed at responding to growing threats of piracy and armed robbery at sea in the Horn of Africa and the Western Indian Ocean. The vessel had a Spanish Navy liaison team on board to help co-ordinate the day-to-day operations with the EU Naval Force flagship, ESPS Galicia.

Establishing a reliable communications link was vital to the success of this campaign and Inmarsat's FleetBroadband proved to fit the brief perfectly. Captain Jorge Alberto Arocha of the Colombian

Navy spoke to Inmarsat at the conclusion of the operation about the challenges of embarking on such missions. According to Captain Arocha, "in an operation like this the main challenge was to maintain communication both with the home country of Colombia and her allies. This was coupled with a real need to manage the cost of these communications because of limited budget." FleetBroadband 500 was used on board the ARC 7 and was a key factor in the success of the operation as it "allowed the Navy vessel and HQ to remain in contact with what was happening at all time, both within Colombia and the Coalition."

CREW MORALE

The 73 crew on board ARC 7 included members from all branches of the Colombian Armed Forces, a National Police officer and the Spanish Navy liaison team.

Captain Arocha said "On such a mission, crew morale is crucial. The operation ran for three months and it was very important for the crew to be able to keep in touch with their families."



NAVY OPERATIONS

Captain Arocha explained that Colombia has few incidents of piracy therefore this mission was outside of their traditional scope. The Colombian Navy is far more involved in search and rescue operations, internal affairs and combating narco-traffickers.

Colombian participation in Operation Atalanta was part of an international mission of cooperation to help deal with the global scourge of piracy. This spirit of international cooperation has been well recognised, significantly strengthening diplomatic ties between Colombia and Spain.

COLOMBIA IS CURRENTLY IN A COMMUNICATION UPGRADE CYCLE

Satellite communications are a political priority for the Colombian government. They are always

looking to improve capability as this is considered to be of primary importance for operational effectiveness and the achievement of success. There is a desire to source new technology and stay ahead of the game. It is this driver which saw the recent evaluation of Inmarsat services for operational fit.

GLOBAL XPRESS: THE LATEST IN SATELLITE TECHNOLOGY

In order to ensure a future-proof communications solution, the Colombian Navy will be conducting live testing of Inmarsat Global Xpress this year to ascertain its relevance for their requirements.



"Inmarsat services provides the best support in achieving our mission goals and by keeping us connected. Inmarsat helps us achieve success."
Captain Jorge Alberto Arocha
Colombian Navy

FX CAPABILITY FOR THE SPANISH NAVY

A.O.R CANTABRIA





SPANISH NAVY GAINS BROADBAND SATELLITE CAPABILITY THANKS TO SATLINK AND INMARSAT FX

The Spanish Navy has exponentially increased its communications and operational capability thanks to an upgrade programme coordinated by Inmarsat specialist, Satlink Spain. This commenced with the installation of an Inmarsat Global Xpress broadband solution aboard the frigate Cristóbal Colón in late 2017.

The initial project was developed by the Spanish Navy and implemented on the Cristóbal Colón frigate during its voyage to Australian waters under a project agreement between the Spanish Navy and the Royal Australian Navy (RAN). During more

than 120 days of navigation, over 200 members of the frigate experienced a high capacity for data transmission, regardless of the geographical location – enjoying a seamless global communications link at all times.

As a result of the project and the operational yields achieved, the Spanish Navy has acquired a new system for another supply vessel of its fleet and is planning to implement it across even more vessels.

“The Global Xpress system permitted the Spanish Navy AOR ‘Cantabria’ to permanently benefit from the necessary connectivity during her deployment as flagship of Operation ‘SOPHIA’. In this way, this data service allowed the ship’s crew to effectively fulfil its mission, while remaining in close contact with other external activities.”

Cdr Jose María Fernández de la Puente Millán, AOR Cantabria, Commanding Officer.

“Global Xpress is the only broadband network that can deliver Internet anywhere in the world using the same network. Military missions, such as those carried out by the Cristóbal Colón frigate, entail crossings that can last for months, so we are sure that the crew will appreciate the new data services with which from now on they will be able to interact.”

Óscar Santidrián García,
Government Director
Satlink



ABOUT SATLINK

Since its foundation in 1992 Satlink has become the local leader in satellite communications industry. Our partnership with Inmarsat gives us the ability to provide global coverage for voice and data services to any kind of user, regardless of location whether at sea, on land or in aircraft. Satlink has been working with the Spanish Ministerio de Defensa since 2004, and this long experience has created a close relationship with Government market allowing us to find the best solution in each case.

However, the main factor that has contributed to our growth has been our strong conviction to address all customers' needs. Thanks to our commitment with the IT and R&D department, we provide the most value added services and tailored solutions to our customers, allowing them to increase their business and provide value to their end-users.

www.satlink.es

MAKING A BIGGER DIFFERENCE:



THE SPANISH VESSEL 'CANTABRIA' RESCUES 127 MIGRANTS IN THE MEDITERRANEAN

"Military supply vessel Cantabria has rescued today 86 migrants off the coast of Libya and collaborated in the rescue of other hundreds of people"

The Cantabria received real-time situational information regarding the presence of a vessel with migrants on-board some 50 miles off the coast of Libya. The Cantabria was able to set course to the zone, where it rescued 115 people: 101 males, 13 females (six of them pregnant) and one baby. They were all on-board an inflatable vessel and without life

jackets. Following this initial rescue, The Cantabria received further information of another vessel in distress and was able to reach the second vessel, some 35 miles off the coast of Libya, and 20 miles from the previous location. In this second location, another 12 people were rescued, and another 119 migrants that were on-board the German frigate 'Mecklenburg Vorpommern', which had also been operating in the zone, were transferred to the Spanish vessel.

KOREAN FISHERIES MONITORING CENTER

PREVENTING ILLEGAL, UNREPORTED AND
UNREGULATED (IUU) FISHING





IUU FISHING WAS DAMAGING THE REPUBLIC OF KOREA'S INTERNATIONAL REPUTATION.

The US identified Korea as having vessels engaged in IUU fishing in the CCMLAR area in January 2013.

The EU also yellow-carded Korea on November 26 2013 for illegal activities by some Korean-flagged fishing vessels in West African waters, and the non-existence of a monitoring system.

Korea needed to take serious actions in the fight against IUU fishing so as to avoid a negative impact on fisheries exports as well as to influence the fundamentals of Korea's distant water fisheries industry.

The Ministry of Oceans and Fisheries has management responsibility for this issue. The Fisheries Monitoring Center (FMC), as an affiliated government agency, conducts MCS (Monitoring, Control, and Surveillance) activities on Korean distant water fishing vessels.

Before the monitoring center satellite solution was implemented, specific areas were monitored by a system that did not function optimally because of maintenance difficulties. This was compounded by the government being unable to monitor or control IUU fishing

vessels efficiently due to the absence of dedicated personnel to operate such a system. Korean distant water vessels were using three different satellite units, i.e. Argos, Iridium and Inmarsat C. To standardise the system the government worked with Inmarsat partner KT Sat to distribute Inmarsat's IsatData Pro (IDP) units to vessels with no on-board Vessel Monitoring System (VMS)" within a short period of time, thus facilitating the operation of the FMC.

"Inmarsat provides global coverage and enables us to track Korean distant water fishing vessels operating even in Polar Regions. Being a communication platform, it also provides a two-way digital communications and texting service. This consequently stimulated the development of an electronic reporting system, allowing the (Korean) government to analyse catch data for stock assessment. Having a Korean satellite service provider was also beneficial for us to address maintenance issues by taking immediate steps."

Taehi Ri,
Director of the FMC



THE ELECTRONIC REPORTING SYSTEM

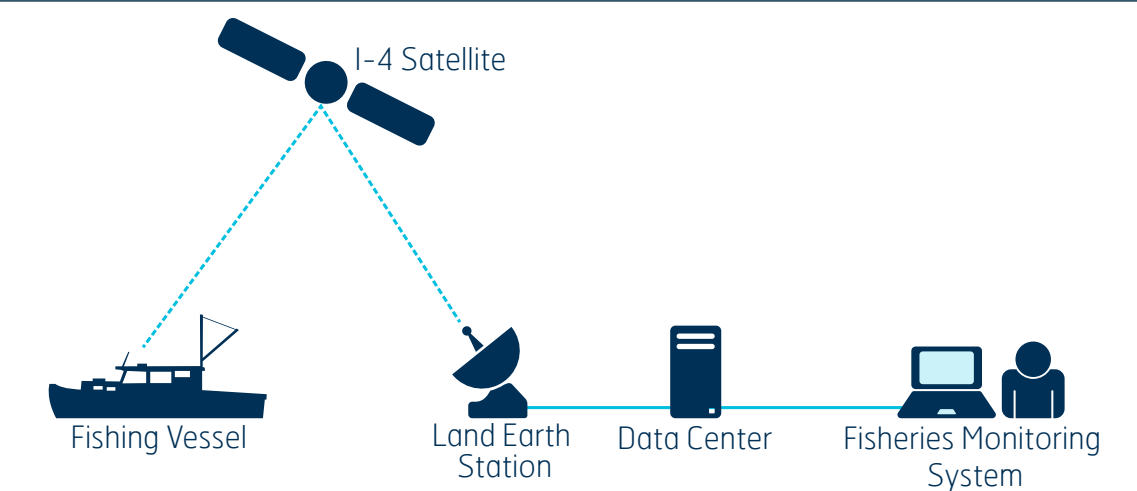
Korean distant water fishing vessels used to transmit their positions by using one of the three different satellite systems (Argos, Iridium, Inmarsat). Since the Electronic Reporting System (ERS) was implemented in September 2015, all distant water fishing vessels have been required to transmit positions as well as logbook entries through IDP, a solution that is capable of two-way satellite communication.

At present, 230 distant water fishing vessels and 70 offshore squid jigging vessels are fitted with the units.

Inmarsat's IsatData Pro service provides global satellite network coverage and data transmission to track and monitor Korean fishing vessels across the world.

SUCCESS

The Korean government now boasts a robust and comprehensive monitoring and control system, receiving positions and logbook entries electronically from all distant water fishing vessels. This system played a significant role in the decision by the EU and the US to remove Korea from the preliminary IUU country lists. Also, the FMC has been visited by over 200 delegates and experts from all parts of the world, thereby increasing its transparency and reliability in the management of distant water fishing vessels.



FISHERIES MONITORING SYSTEM (FMS)

The Fisheries Monitoring System (FMS) is designed to receive VMS messages from all satellite systems on an hourly basis. When necessary, the frequency can be reduced down to one minute, enabling monitoring agents to perform more targeted monitoring.

The FMC conducts routine monitoring of vessel tracks and their movement. Upon detection of any suspicious behaviour, the FMS issues automatic alerts so that monitoring agents can give direct instructions to vessels and vessels operators.



"We are glad that we could play a role in establishing the Korean Fisheries Monitoring System. We also are very happy to deliver our valued maritime satellite solution to our Government. The Korean Government was pleased with the service as it increased safety levels of domestic vessels and their crew, and also eliminated many international disputes by complying with the IUU guidelines."

Chris Kim
Business Manager - Maritime Service Team
Satellite Service Division
KT Sat

\$6
BILLION
ESTIMATED GLOBAL
COST OF
ILLEGAL FISHING

FISH STOCKS
HAVE SEEN A
90%
DECREASE IN THE PAST
60
YEARS

27
MILLION TONNES
OF UNWANTED MARINE
LIFE ARE DUMPED
ANNUALLY

ISATDATA PRO

ISATDATA PRO IS A GLOBAL SATELLITE DATA SERVICE DESIGNED FOR TWO WAY TEXT AND DATA COMMUNICATIONS WITH YOUR ASSETS, ANYWHERE, ANYTIME.

IsatData Pro increases business efficiency, lowers operations costs and enables compliance with government regulations. Applications include transferring electronic documents and vessel telemetry information, text-messaging remote workers and maintaining up-to-date captain's logs and many more.

The IsatData Pro service is designed for mission-critical applications. All messages are delivered within seconds, making IsatData Pro ideal for sending information to people operating in high-risk areas, reporting alarm conditions and retrieving logs from remote equipment during an emergency.

SMART DATA TERMINALS

IsatData Pro satellite service provides a choice of field-ready terminals or embedding the modem (IDP-100) into existing systems. Within the terminal family of products, customers can

choose between terminals designed for land-based (IDP-680) or maritime (IDP-690) applications.

ISATDATA PRO HARDWARE FEATURES

Integrated GPS for location-based services

- Environmentally-sealed enclosure for outdoor installations
- Low-power modes for battery-powered applications
- Peripheral interfaces for connecting to analog, digital and serial devices
- Serial interfaces for connectivity to RS485/J1708 and Modbus interfaces
- Programming capability and user tools for quick customization to meet business needs

APPLICATIONS

- Send electronic documents including logistics, forms and billing signatures
- Text-message captains and remote teams
- Collect and send logs required to meet transportation and government regulations
- Collect and transmit telemetry information from vehicles and heavy equipment
- Download report logs from environmental data logging equipment
- Send pressure, volume and other sensor information from remote well sites
- Aggregate, monitor and communicate information from smart grid sensors in near real-time

KEY BENEFITS

High messaging capability

- Send and receive more data to allow better visibility of business operations and risk management
- Communicate information to remote workers and assets where previously not affordable or available

BEST VALUE

- Equip fleets and asset groups of all sizes with competitive hardware and airtime pricing
- Accurately budget communication costs without roaming charges

ROBUST AND RELIABLE SERVICE

- Receive notification of events within seconds
- Install customizable, environmentally-sealed terminals anywhere, even in harsh environments

IDP 680



IDP 690



IDP 800



VIDEO STREAMING FROM UNMANNED SURFACE VESSELS

INCREASING OPERATIONAL
EFFECTIVENESS FOR HIGH
RISK MISSIONS



UNMANNED SURFACE VESSELS

ANTI-PIRACY PATROLS, MARITIME BORDER SECURITY AND ANTI-MINE WARFARE ARE MISSIONS THAT INCUR A HIGH DEGREE OF RISK FOR GOVERNMENT OPERATIONAL PERSONNEL.

The Al Marakeb boat manufacturing company has been designing and producing Unmanned Surface Vessels (USVs) since 2007 and currently have a suite of designs for all government and commercial missions. Recognising the need to expand operational scope, they have worked with the Scotty Group and Inmarsat to produce a quality video and auto pilot solution that could be optimised for transmission via satellite.

Al Marakeb USV deploys an Ultra High Frequency (UHF) radio communication system that is used to remotely command and control the USV's auto pilot. The auto pilot

is used to provide the steering capabilities needed to sail and operate the vessel. The UHF radio also connects to a high resolution camera capable of relaying video streaming / surveillance images from the vessel to a shore based command and control room.

UHF LIMITS RANGE

While the UHF radio can provide the primary communication service required to instantly control the USV, due to the nature of the UHF radio, it has a limited range.

USVS: A ONE-STOP SOLUTION TO MARITIME RISKS

DESIGNED FOR ALL APPLICATIONS, THE INCLUSION OF INMARSAT FLEETBROADBAND EXTENDS OPERATIONAL RANGE

The s come in four different size configurations, including an electronically powered version. The addition of the Inmarsat FleetBroadband satellite terminal allows the expansion of the vessel's range, making it perfect for:

- Maritime surveillance
- Maritime border security
- Environmental remote sensitivity
- Oil Spill Mitigation and hazardous material detection
- Anti-piracy patrol
- Early warning systems



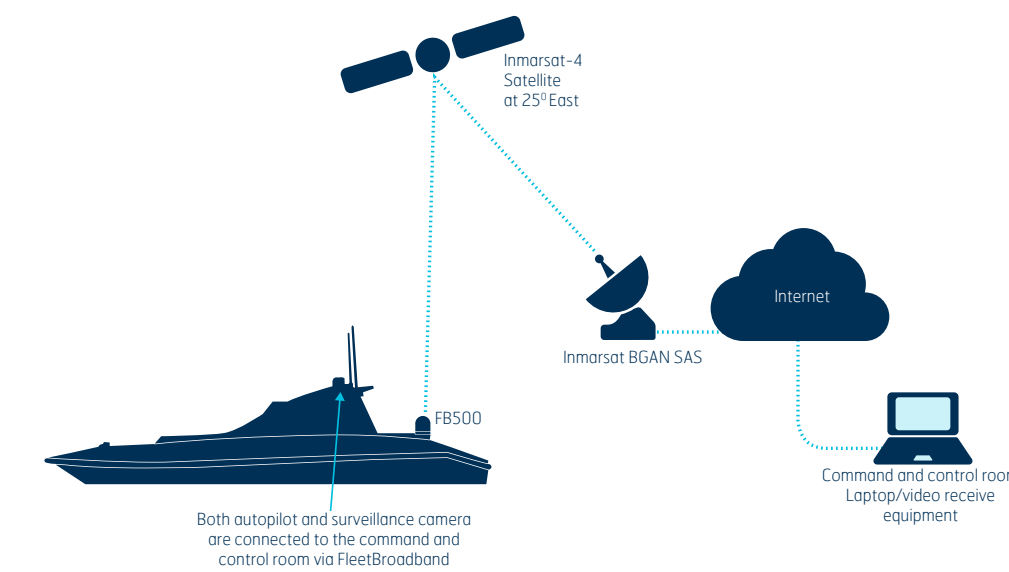


INMARSAT FLEETBROADBAND

FleetBroadband (FB) is Inmarsat's premier maritime service that delivers seamless global voice and broadband data, with a range of capabilities and antenna sizes to suit all vessel sizes and customer's needs.

As it is similar to a 3G network, FleetBroadband offers most services defined in the standard 3GPP (3G Partner Project) specifications. In addition FleetBroadband will offer a 4kbps voice and a 64Kbps ISDN services.

The user terminal is capable of making simultaneous voice and data calls over the Inmarsat -4 network. It can also be used to send command and control information and receive streaming video, as is the case with Al Marakeb USV.



Al Marakeb USV command and Control via satellite using Inmarsat FleetBroadband

THE SCOTTY BLUEBOX

The SCOTTY BlueBox makes it possible to stay in touch and exchange the highest resolution imagery, in real time, from anywhere at sea

The newest generation hardware coder/decoder and processing unit delivers superior full high definition (HD) video and audio over satellite. The Bluebox supports a wide range of audio, video and data interfaces for various interactive applications. The unit also has a built-in recording function and can stream video to any personal device connected to the network. The Bluebox can be used for:

- Surveillance
- Crew Welfare
- Remote Office
- Telemedicine
- Remote Support

FEATURES

- HD real-time video stream, video communication, and data exchange over lower bandwidth maritime satellite networks.
- Duplex comms for real-time feedback, commands, and even remote sensor control.
- Fast file transfer for store & forward imagery or any other data.
- Compatible to all H.323 VTC systems and encryption.
- Designed and certified for maritime environments.



www.scottysgroup.com
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BENEFITS

- The BlueBox is a newest generation hardware coder/decoder and processing unit delivering superior full high definition (HD) video and audio over satellite.
- The user can select resolution and frame rate to accommodate bandwidth available. By lowering the frames per second (fps), the user can transmit live HD video over data rates as low as 192 kbps.
- The BlueBox can connect to any L-band system. HD transmission is even possible over Background Mode.
- The BlueBox supports a wide range of audio, video, and data interfaces for various applications.
- The unit also has a built-in recording function and can stream video to any personal devices connected to the network.
- Specifications:
Weight 3.2 kgs
Size 60 x 194 x 320 cm
24V/28V DC / 50W
- Commercial, airborne, and mil-spec versions also available.

THE ISSUE

The primary challenge using the USV is to provide communication capabilities with the vessel at all times. But as the range of the UHF radio is limited to Line of Sight communication, which can only extend to 10 or 15 km maximum range. Providing a communication service that can "extend" the range and hence the capabilities of the USV is crucial to successful operations.

THE SOLUTION

Providing a satellite based system that can enable Beyond Line of Sight (BLOS) communication service with the vessel is paramount. Al Marakeb USV will be equipped with both a UHF and an Inmarsat FB 500 terminal enabling the instant, reliable and BLOS communication services needed to remotely command, control and obtain video streaming from the vessel even when it is outside the range of the traditional UHF radio system.

Using a FB 500 unit, the USV operator can command and control and obtain video streaming images from the USV anywhere around the world. The Scotty Blue Box ensures the delivery of superior full definition video and audio over satellite.

HOW TO BUY

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