



Paradigm's SWARM VSAT used by Primary Assessment Teams. Photo courtesy of Paradigm

The role of VSATS in global disaster response and recovery

When disaster strikes, one of the first critical tasks is to get communications up and running. Time and time again, VSAT has proven itself to be a fantastic aid in establishing emergency communications, in times when terrestrial methods may be damaged or overloaded.

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As constant connectivity and the exchange of large amounts of data has become more and more vital in the field of global emergency and disaster response, VSATs have become key components in the roll out of current and future communication models for the sector. Reliable communication solutions are critical over four main areas in these environments:

- Rapid deployment of primary assessment teams;
- Setup of temporary and long-term Operations Management and Communication Centres;
- Deployment of mobile response units; and
- Cellular backhaul to replace damaged community infrastructure.

The UN, Aid Agencies, and non-government organisations (NGOs) around the world understand the importance of the first 72 hours of disaster response. The

Office for the Coordination of Humanitarian Affairs (OCHA), the UN's emergency coordination organisation, operates on the premise that there are five essentials that need to be delivered within this initial response period: Preparation, deployment of skilled staff, context awareness, response assessment and mobilisation planning. All have one thing in common - the requirement to communicate.

The 72-hour window

During this 72-hour window, a vital priority will be to insert small, rapid response teams into the region to quickly assess the situation and evaluate the current infrastructure. Any existing in-region communication network, if it's still operational, is likely to have already been overwhelmed by demand, or not able to provide suitable, stable bandwidth for the operation. Due to the slow deployment times of alternative terrestrial connectivity solutions, the main type of communication will be over satellite, and when choosing which satcom terminals will be used, several criteria come into play. These critically important primary teams will benefit from satcom solutions which are mobile and can be deployed rapidly. The ideal terminals will be lightweight, quick, and simple to operate, but also able to provide enough stable communication bandwidth to support video, voice calls, and the network connections required for the initial reporting.

The satcom solution also needs to be small and portable as transporting the necessary equipment for these primary assessment teams is likely to be via commercial airline, with onward transport in helicopter or truck. But reaching the location quickly and safely is only one of the challenges the teams face. Once an assessment area is located and the

team and gear transported to site, a temporary setup commences requiring communications equipment to be setup quickly. The main requirement of the teams is to send videos, photographs and situation reports out to the world, raising awareness, generating donations, assisting government municipal departments, and paving the way for the next wave of support teams. Here, speed of setup is also crucial as in the early stages of assessment the response team is likely to move between various locations before establishing a primary response site. These initial assessment teams will continue to provide support until enough information and evaluations have been completed to enable the successful setup of a more permanent communication centre to support the response effort.

As Agency and NGO teams need to train constantly across all skillsets to prepare for all eventualities, VSATs that are simple to use and easy to train on will reduce training time and allow for more time to be spent on training in other areas. It also allows for training to be conducted internally between users, without requiring expensive external training from equipment manufacturers. VSATs that are quickly setup, easily pointed onto a satellite, and operate with data speeds that are comparable to home internet speeds are ideal. Those that can also be transported quickly and easily, either fitting into a backpack or hard case that's small enough to be stowed under a seat or in an overhead locker, are much sought after.

The UN's Disaster Assessment and Coordination department (UNDAC) has added the SWARM VSAT into their equipment line-up since it met all the initial criteria: It's a small size in a transportable backpack, light enough to be carried comfortably by one person, very quick to setup and simple to point at a satellite. Additionally, the SWARM's multiband options along with certification on all major high throughput worldwide satellite networks enables it to offer the flexibility required for global operations by these sort of user groups. The data connection has demonstrably provided enough bandwidth for high-definition video, multiple voice calls, email, Internet, and VPN-connected local office network access. However, the primary reason that the SWARM was adopted by UNDAC is because it integrates the PIM® - Paradigm Interface Module. The unit simplifies the user experience, reduces operating costs, and provides a central unit for the integration and functioning of satellite terminal hardware. The PIM controller provides a simple to use interface for the assimilated modem, baseband switching, assisted pointing and setup functions of a VSAT and comes with a built-in visual crosshair and audio pointing device. The unit can support Power over Ethernet devices and provides a multitude of services to the end user - from VLAN setup and management to smart auto-selecting of AC and DC power interfaces. As well as making pointing quick and simple for any user, PIM-powered terminals provide a common operational experience which reduces training requirements as well as being compact, weatherproof, rugged, and low powered.

Longer term communications

The next step of response, once the initial deployment assessment teams have evaluated the zone and put in place the essential initial quick deploy communications links, is to prepare for the next stage of the connectivity deployment: The setting up of longer term operations management and communication centres. Depending on the situation, the communication solutions for these will often be slightly larger flyaway VSATs, or larger, semi-permanent installations which

can support higher throughput satellite communication links.

We know that the UN(OCHA) teams train on the setup and deployment of a remote temporary office which will provide local Wi-Fi and LAN networking capability and also include the capability to setup a remote wireless-linked secondary office. These set-ups aim to standardise and equip administration centres with all means of communication, including the addition of an independent backhaul data route into the internet that will provide much needed connectivity. This also means a route for virtual private networking options that will keep the newly setup office connected directly to the aid agency or to the UN's main data network, effectively operating as an extended office and giving the operational teams access to their day-to-day-digital files and folders.

This backhaul connection is important and is often overlooked in the role of these support offices. The connection will provide a route for all incoming and outgoing administration data into the region, as the centres will most likely be unable to use any local communication networks, either due to the nature of the disaster, or due to the deluge of locals struggling to perform their own communication by any means possible. The equipment and services used for this backhaul connection must be able to support the office connectivity requirements, meet the transport requirements of shipping into a disaster region, and be simple to setup and use, reducing the technical skill requirement of the operators. The operators, in all likelihood, are IT support teams, trained to setup and manage office networks; the integration of a satellite terminal into their hardware arsenal should be as simple and as unobtrusive as possible.



Rapid deployments and simple pointing using the PIM. Photo courtesy of Paradigm

The UN (OCHA) department has put together standardised office deployment kits, ready to be sent out to disaster regions all over the world at a moment's notice. The kits contain everything that is needed to setup a temporary administration centre with remote outlier capability. The required VSAT for these kits needed to be a product that is transportable in ruggedized cases, capable of being setup in less than 30 minutes, but also capable of remaining installed for months at a time. Added to that are the criteria that it should be as simple as possible to point at satellites and provide the highest achievable data transfer speeds and network reliability that the VSAT's size could offer.

A clear choice has been Paradigm's CONNECT100T VSAT, made partly in tandem with the selection of the SWARM terminal for the rapid response assessment teams, because they both operate using Paradigm's PIM. This provided the UN and other agencies with a common operational interface between the VSATs. The ability to use one VSAT gives the operator the skill to operate the other because the operational procedures are the same across both. This has consequently drastically reduced training time and costs. The CONNECT100T also matched other requirements. It's supplied in three courier-friendly and IATA compliant tough transport cases, takes less than 30 minutes to setup and, because it uses the PIM, it's simple to operate. The VSAT aperture size provides the ideal balance between data throughput and network operation costs and the terminal's low power consumption pairs well with solar or generator power sources. The CONNECT100T is also available for operation on global satellite networks, ready to support disaster responses anywhere around the world.

Targeted relief

Finally, the third response wave is the deployment of mobile response units to deliver more targeted relief to the region. These are rugged vehicles which are specially fitted out with the equipment necessary to create emergency communication centres wherever the vehicle is located. By being constantly on the move, Aid Agencies, NGOs, and private sector partners can assess the overall situation and decide on the level of support that each location requires. These mobile communication centres are scaled down versions of the models applied in longer term situations. They provide local area networks and device connectivity supported by satellite terminal backhaul communications. Once again, this enables on-the-ground support personnel to access agency networks, sending and receiving much needed information all aimed at assisting the local needs and at alerting the wider audiences, hopefully then raising much needed support.

Mobilising communication centres increases the security risk to the personnel and the equipment. Whilst Aid Agencies and NGOs rely on being quickly and easily identified as support and care givers, ideally the communication equipment still needs to be nondescript and unobtrusive, promoting security and lowering risk of theft or worse.

As with the static support centres, the VSATs utilised in these mobile units should be able to maximise data throughput and provide as much bandwidth as possible, but balanced with simplicity of use, mobile operations and simple vehicle installs. As with static communication centres, the operational personnel are multi-skilled, and so the ideal VSAT for integration into a mobile vehicle-based office environment is one that needs as little interaction as possible. Ideally, the

VSAT would perform any complex operations automatically, or with minimal intervention.

And as before, keeping training to a minimum to reduce costs will still be a key factor in the selection process. Automatic operation maximises connectivity time, minimises intervention and enables team members to focus on other vital elements of their roles.

Connectivity between laptops and phones is also paramount, reducing the level of stress induced by equipment and maintaining the ease of delivering locally produced video footage, reports and assessment information. Being online in remote districts and regions enables the teams to perform actions in real time, they don't have to wait or travel distances to achieve any level of suitable data connection.

Due to its extreme simplicity, rugged compact design and ease of use, Paradigm's MANTA VSAT has been adopted by Aid Agencies, NGOs, and private sector support groups specifically for their mobile response units. Supporting use on all major Ku-band high throughput satellite networks, the MANTA terminal utilises state-of-the-art software-steered beams, enabling the terminal to automatically point onto a satellite without any moving parts, or any interaction from the operator. The benefits of this were immediately recognised by the aid groups as it immediately reduced training costs. Rapid vehicle mounting, discreet low profile characteristics, high throughput satellite connections, and the generation of a local Wi-Fi network meant that teams were online wherever the vehicle went, stationary or mobile, without having to use low quality, unreliable low communication networks.

Global disaster response efforts

The progressive reduction in the complexity and cost of communicating over satellite has made significant improvements to the speed of response and the overall success of global disaster response and recovery. VSATs which meet such criteria will consequently play a vital role in this sector. If, as many scientists predict, we are to see an increase in extreme weather events and global instability bringing about more flooding, droughts, crop failures and mass migrations then demand from emergency response organisations for suitable VSATs will only increase. ■



Training on PIM-powered VSATs is common across all terminals. Photo courtesy of Paradigm



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