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How a Trust is using technology to meet the challenges of a new era.

Information management for civil contingency responders

BAPCO Journal

Volume 16 Issue No 1 • January 2010 • £3.50

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Printed in the UK by Latimer Trend & Co, Plymouth, Devon.

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Published by **Hemming Information Services** 32 Vauxhall Bridge Road, London SW1V 2SS
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Back in print – the CAG column

Many of our new members will probably be asking themselves: who or what is CAG?

I believe the definition can be summarised as follows: the Commercial Advisory Group within BAPCO, otherwise known as CAG, is an important partner in the Association that represents commercial suppliers who have links with and/or conduct business in support of, all civil contingency responders: recent events in Cumbria have shown, once again, the importance of that role. The intention of the CAG Committee that acts as the co-ordinating body, is to bring together all commercial members of BAPCO to obtain a full range of information, ideas and experiences with the aim of producing a coordinated approach to maintaining a two way dialogue with the active members ie the professional responders.

Once this co-ordinated approach is in place, it would be possible for joint meetings of the CAG Committee and the representatives of the civil contingency responders to be arranged with the aim of producing requirements for operational and technological tools for future equipment and systems to improve the services offered by the latter groups in the carrying out of their duties and also to influence the research and development plans for industry and research bodies.

The end goal is to produce, in the light of information in the public arena (obviously without jeopardising commercially-confidential information and developments) data related to what will be available to the civil contingency organisations and agencies now, and in the future, without them having to trawl through reference books or listen to current opinions/promotions of the latest technology. By these discussions and taking relevant action, equipment will be available to them which is not about to become out of date at the moment of installation and which meets their stated needs.

This is an ambitious goal and will challenge all our commercial members, both large and small traders, to contribute to the central aim of providing winning projects for the future, from major systems to small niche product that might not otherwise have seen the light of day by normal market research carried out by the emergency services independently.

The end result will be that, not only will our commercial members benefit by association with the professional advice offered to the civil contingency responders, BAPCO will, itself, enjoy an enhanced reputation as the leading body that those services will recommend as essential membership in order to stay ahead in their own respective fields.

CAG hold meetings quarterly, or whenever the need occurs, to discuss the latest information useful to our active membership. It is planned that in the future these results will be placed on the users' password-controlled section of the BAPCO website.

I would like this column to include comments and observations from my commercial colleagues. Please send them to me (colinevans1@hotmail.co.uk) and I will include the best ones in the next column.

Until next time!

Colin Evans, CAG Secretary

EC projects on prevention and preparedness

On 19 December 2009, The European Commission published a new call for proposals covering the field of civil protection. It tackles two different sections, prevention and preparedness, each with their own objectives and budgets.

The new call proposals are as a result of the increasingly wide range of disasters being faced in the EU. The forest fires in the summer of 2009 burnt tens of thousands of hectares of vegetation and woodland in various Southern European countries. The earthquake in Italy in 2009 claimed many lives.

One way to strengthen the EU response to such disasters is to enhance preparedness in European civil protection. This call for proposals will help to fund activities aimed at awareness-raising and closer cooperation in civil protection. The legal framework for this call is Council Decision No 2007/162/EC, Euratom1, establishing a Civil Protection Financial Instrument.

The purpose of the Civil Protection Financial Instrument is to support the efforts of Member States to protect primarily people, but also the environment and property, including cultural heritage, in the event of natural and man-made disasters, acts of terrorism and technological, radiological or environmental accidents. It also aims to encourage more cooperation between the Member States on civil protection.

The objectives of prevention projects are :

- Developing knowledge-based disaster prevention policies
- Linking the relevant actors and policies through the disaster management cycle
- Improving the effectiveness of existing policy instruments for disaster prevention.

The objectives of preparedness projects are:

- Improve the effectiveness of emergency response by enhancing the preparedness and awareness of civil protection professionals and volunteers
- Support and complement the efforts of the participating countries for the protection of citizens, environment and property in the event of natural and man-made disasters
- Facilitate reinforced cooperation between the participating countries in preparedness for civil protection and marine pollution.

Proposals should should also be particularly relevant to the field as described in Council Decision 2007/162 establishing the Civil Protection Financial Instrument.

The deadline for submission of proposals is 31 March 2010 – for more information go to http://ec.europa.eu/environment/civil/prote/pdfdocs/call_2010/grant_applic_guide.pdf

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The e-poll: has mobile data delivered?

This month's e-poll asked, "Has value for money been achieved as a result of the police roll out of mobile data functionality in the context of operational benefits?"

And underwhelming 56% said 'yes', 33% said 'no', and 11% said 'don't know'.

The word on the street is that the roll out was a missed opportunity on a truly monumental level.

To register your vote, visit www.bapcojournal.com.

Mapping the Digital Future

The Scottish Region of BAPCO has announced that the seminar and exhibition "Mapping the Digital Future – Tools to Help in a Crisis", will be held Wednesday 24 February 2010 at Hamilton Park (across the road from Strathclyde Fire HQ), Hamilton.

The speakers are Russell Keene (Digital UK); Stewart Laing (SPS); Oskan Edwardson (East of England Ambulance Service; Iain McKay; Brendan Murphy (Cordia).

For further details, please contact: admin.manager@bapco.org.uk

APCO in Australia

The 2010 APCO Australasia Conference & Exhibition will be held in Melbourne on 14-17 March 2010 and hosted by the new Melbourne Convention Exhibition Centre.

The 2010 APCO Australasia Conference & Exhibition will be reviewing the critical outcomes of the worst Victorian bushfires experienced earlier this year and other natural disasters around the world.

It is APCO Australasia's mission to bring lessons learnt and new initiatives to their conference by providing a range of key speakers.

New rapid response vehicle for WMAS

West Midlands Ambulance Service Trust has added a new rapid response incident command vehicle to its fleet.

It has been equipped with the latest voice, data and video communications systems by Excelerate Technology to provide state-of-the-art Mobile Emergency Operations Centre (MEOC) facilities. This will further improve the Trust's resilience and help achieve interoperability with other emergency services during major incidents throughout the region.

The MEOC has been designed to play a dual role throughout the West Midlands and will deliver a rapid response communications platform in the event of major incidents as well as providing full back-up facilities in the event of an Emergency Operations Centre (EOC) evacuation.

Excelerate has installed a range of powerful technologies that will enable more informed decisions to be made at the scene of major incidents regardless of location. A rapidly deployable roof mounted 98cm satellite dish provides a resilient stand-alone broadband connection that enables the use of secure telephony, internet and email. The five-seat MEOC is also fitted with a dual thermal CCTV camera that enables live images to be streamed to headquarters around the clock. It also offers an outdoors command room capability with a large external plasma touch screen contained under a heated awning.

Over the next few months the EOC teams will train with HART to ensure they have the best possible arrangements in place.

Ofcom's non-emergency 111

A new 111 non-emergency healthcare phone number is to be introduced, said Ofcom.

Ofcom has confirmed that it will allocate a new memorable three-digit phone number – 111 – for NHS non-emergency healthcare services. This will enable the Department of Health to introduce the service to make it easier for patients to access healthcare in their local area.

Ofcom also confirmed that the Department of Health intends that calls to the number will be free.

The Department of Health asked Ofcom to decide how to allocate 111 for this special purpose.

Ofcom's stated how making 111 available will make the best use of the UK's telephone number resource.

The Department of Health intends for the service to provide advice and information to the public when they need medical help urgently but the situation is not life-threatening.

Ofcom's statement on 111 can be found at www.ofcom.org.uk/consult/condocs/three_number_non_emergency/statement/

WiMax Dubai

Motorola and du (sic), the UAE telecom provider, have implemented a mobile WiMAX Network for Dubai Metro

Motorola's WiMAX equipment provides mobile connectivity and effective backhaul for Wi-Fi traffic on the Dubai Metro transport system train carriages as well as in the Metro stations.

The Dubai Metro will be the longest fully automated rail transport system in the world. The Red Line, which is 52km long, is already functional and is expected to be followed by the Green line in early 2010. Once completed, the Metro will have 47 stations, four of which will be underground.

The network will allow du's customers to access the internet while travelling on the metro, and it is hailed as the first truly mobile WiMAX network in the UAE.

Solving radio interoperability

ETSI's RRS (Reconfigurable Radio Systems) committee has made some progress in its response to an increasing demand for wireless communications, as well as facilitating more flexible use of the radio frequency spectrum.

A series of ETSI Technical Reports that examine the standardisation needs and opportunities have been finalised, including architectural and implementation aspects of RRS, as well as specific user requirements in the context of public safety communications. A summary can be downloaded at:

http://www.etsi.org/deliver/etsi_tr/102800_102899/102838/01.01.01_60/tr_102838v010101p.pdf

Reconfigurable Radio Systems are based on technologies such as Software Defined Radio (SDR) and Cognitive Radio, whose systems exploit the capabilities of reconfigurable radio and networks for self-adaptation to a dynamically-changing environment, with the aim of ensuring end-to-end connectivity.

Global interest in RRS solutions is being fuelled by the rapidly-growing demand for wireless communications for a wide range of purposes eg today there are already more than four billion mobile phone users today, but estimates suggest that by 2017 there will be seven trillion wireless devices serving seven billion users. To meet these expectations with the limited radio spectrum, more flexible ways to share radio frequencies amongst multiple services and radio networks are needed – and RRS technologies offer the solution.

Regulators have started to consider allowing wireless data devices to operate as secondary users on spectrum bands which traditionally have been dedicated solely to their primary users. Typical user devices may contain several radios and it is becoming increasingly vital to co-ordinate the operation of these different radios and systems to minimise cost and make efficient energy use of the overall radio communications capacity. Creating effective, standardised RRS solutions is an essential foundational task in this fast-moving revolution.

The ETSI committee is addressing the public safety communications. Currently, these are characterised by patchworks of separate, often incompatible systems with widely varying capabilities. The application of dynamic spectrum management, cognitive radio and SDR can provide solutions for the required interoperability of such systems, which often operate in uncertain and changing operational scenarios, and maximise the use of the very limited radio spectrum usually assigned to these services.

CyberTech's enhancement on ROI

CyberTech International, a leading global provider of voice and data recording technologies, has announced the immediate availability of a new multi-tenant platform.

Available free of charge to existing users, CyberTech Release 5.4 enhances return on investment (ROI) by allowing different business units within an enterprise to co-exist on a single recording system.

The multi-tenancy architecture of this latest version also includes new agent evaluation features and optimised hosted recording capabilities for enterprises and communications service providers.

CyberTech Release 5.4 enables individual tenants to manage their quality and compliance recording system independently without having to rely on a third party, providing a platform for enterprises wishing to economically consolidate business units on a single virtual recording system platform.

30 minutes to recovery

Forces from South Yorkshire and Nottinghamshire took just 30 minutes to intercept and recover a stolen Nottinghamshire County Council pick-up truck. The vehicle had recently been equipped with a Thatcham Category 5 satellite tracking device from Masternaut Three X.

Using live tracking on the web, Mick Monaghan of the Council's Highway Operations team helped to direct Nottinghamshire Police Force's helicopter and South Yorkshire patrol vehicles to intercept the stolen vehicle. Within 30 minutes the vehicle was recovered undamaged, saving the Council the cost of replacing it and also stopping further inconvenience caused by the theft.

OS OpenSpace Pro – new locating service

Sir Stirling Moss and Alan Hinkes at the launch of Locatorz.

A new mobile phone-based locating service that allows a person's position to be ascertained to within 10 metres is the first fully commercial application to use OS OpenSpace Pro.

The innovative mobile phone device, called Locatorz, works by using a mobile phone's GSM connection to transmit its position to the Locatorz server by sending a GPS signal. From this signal Locatorz plots the information on to an Ordnance Survey map and sends it to a viewable, secure Internet page.

The online service is built on the OS OpenSpace platform and allows smooth panning and zooming to locate people. OS OpenSpace is one of the most detailed online mapping products, with scales ranging from an outline of Great Britain down to a street view scale where properties can be identified.

OS OpenSpace Pro is designed for use with high-volume and commercial websites and builds on the success of OS OpenSpace, a free online mapping application for community groups and web developers.

The Locatorz service is ideal for a variety of users – doctors, district nurses, estate agents, social workers, bailiffs, taxi drivers and many other people often called to visit locations where their safety may be an issue. In addition, it can also be used by individuals and families to locate children, and elderly and vulnerable relatives.

Airwave open Academy

Airwave has announced the launch of Academy, a training programme for all users of the Airwave national radio communications service including the police, fire and ambulance services.

The programme will train users in how to work more efficiently and effectively with the Airwave network service. The courses, tailored to the requirements of each individual police, fire or ambulance service, will allow officers to maximise their existing investment in the network while realising measurable operational efficiencies and improved safety for frontline users.

Academy offers live and online classes to suit different requirements and to ensure that day-to-day operations are not affected. Additional sessions will provide students with the opportunity to earn ITIL accreditations. Devon and Cornwall Police will be the first force in the UK to pilot an Academy programme when it launches a trial in January 2010. The force will have an initial assessment followed by online training on seven modules.

Cabinet Office sign up PageOne

PageOne has secured an exclusive agreement with the Cabinet Office to supply MTPAS-enabled two-way pagers to emergency responders

The two-way pagers will be exclusively MTPAS (Mobile Telecommunication Privileged Access Scheme) enabled for all Category 1 and 2 responders.

The Cabinet Office-run scheme ensures that all Category 1 or 2 responders in an organisation that uses PageOne two-way paging will be MTPAS-enabled after a special SIM (Subscriber Identity Module) is inserted into the pager.

MTPAS is invoked in the event of a major incident, allowing privileged access to the mobile network for Category 1 and 2 Responders. To prevent cell overload, the number of MTPAS-enabled mobile phones within each Category 1 and 2 organisation is limited, meaning that not all Category 1 and 2 responders will receive an MTPAS-enabled SIM for their phone. As it uses the PageOne wide area paging network for out-going messages (and status and reply messages use very little data), PageOne can provide all Category 1 and 2 responders in an organisation with an MTPAS-enabled SIM.

The two-way pager provides reliable two-way communication with the added benefits of auto acknowledgement, location of pager and response messages returned over either GPRS or GSM. The reply feature guarantees that the message has been read. The pager includes a GPS chip that supplies the control centre with the last known location of the pager together with a reply message, allowing for better location of responders and more efficient deployment of resources. Furthermore, it allows messages to be broadcast simultaneously, maximising the number of Category 1 and 2 responders that can receive a message as quickly as possible.

ATEX radios with HART

For the first time nationally, paramedics will be able to work within the inner cordon of major hazardous incidents, thanks to the delivery of new intrinsically safe radios.

The new Hazardous Area Response Teams (HART) across England are being equipped with radios which are safe to use in environments such as petrochemical works, industrial areas or accident scenes where they may be explosive gases. The Department of Health has ordered 10 Motorola MTP850Ex digital TETRA radios for each of the 15 HART teams in England, and they will be in operational use by April 2010.

Until now, most ambulance personnel have worked only on the outer cordon of major incidents, relying on the fire service to retrieve casualties. Only a handful of ambulance services have previously used intrinsically safe radios.

James Price, HART team manager at West Midlands Ambulance Service, said: "This is the first time paramedics nationally have been able to work within the inner cordon. Until now, it's been inconsistent in that just a handful of ambulance services have had intrinsically safe radios.

"Some incidents involve hundreds of emergency workers, so its' vital we have crystal clear, effective communication.

"We have been testing these sets within West Midlands for the past two months in all levels of HART personal protective equipment. They have proven robust, reliable and effective in all situations. The delivery of these sets to all the teams shortly will see HART using safe and effective communications with a world class product from Motorola and a reliable network provided by Airwave."

Smart in Yorkshire

Britain's fourth largest police force is the first to procure identity and access technology using NPIA framework in readiness for the upcoming Police National Database.

Siemens Enterprise Communications (SEN Group) has announced that West Yorkshire Police is the first to procure smart card technology via the National Policing Improvement Authority (NPIA) Identity and Access Management (IAM) framework.

The solution will allow West Yorkshire's officers access to Central Services (IAM CS), established by the NPIA for secure information sharing as an essential foundation of the upcoming Police National Database (PND), due to be launched in 2010.

West Yorkshire's decision to procure an end-to-end identity and access (IAM) solution via the SEN Group framework demonstrates a commitment to sharing confidential and potentially critical case information with police forces nationwide.

As framework holder the SEN Group's solution includes components and expertise from Sysec and ActivIdentity. It will provide West Yorkshire with 11,000 smart cards, a card management system, public key infrastructure, card issuing machines and other components that adhere to the IAM CS standards. This will ensure West Yorkshire staff are able to access the upcoming PND, a central and highly secure resource for police forces across the UK to share case information.

The full system will be rolled out by April 2010.

The process is "broken"

The second of the three autumn BAPCO Roadshow events took place in Hendon in late October 2009. The BAPCO Journal was there to cover the interesting and diverse talks that took place during the day, including a rallying cry from former BAPCO President Ian Readhead and Chief Executive of BAPCO Ray Trotter to those in attendance – and the organisations they represented – to support an appeal to Ofcom to try and change the spectrum purchasing legislation with regards to the emergency services. Dan Worth reports.

The first talk of the day was given by Rich Edwards from QinetiQ and concerned Project SECRICOM (Seamless Communication for Crisis Management). The vision of the project is the ability for responders to operate across different European emergency services/responder agencies, as one cohesive unit, at the time of crisis. It is also to mitigate any capability gaps faced by the users of existing systems over international borders.

To define the scope of the project and the focus of the demonstrator there is a need to identify the types of capability/interoperability gaps which currently exist. To date the project has an agreed crisis scenario and a set of user requirements. As Edwards explained, there is no direct correlation between user requirements and an existing communications infrastructure. A methodology to provide a clear audit trail between a user requirement and a communications infrastructure/architecture has been developed. This involves using Information Exchange Requirements. Although a scenario is used to "tease out" the IERs, they can ultimately be scenario "agnostic". A representative set of IERs has been captured with the help of BAPCO members from the primary responding agencies.

The SECRICOM project is set to finish in 2012 with a demonstrator event that will give organisations the chance to show how technology can mitigate the identified capability gaps whilst exploiting existing comms systems.

Next up, Osken Edwardson from the Department of Health (DoH) gave a talk on the Ambulance Services' response to an influenza pandemic and the importance of accepting that in such a crises the NHS and Ambulance Trusts would have to work under different considerations and operating circumstances. One of these would be the importance of seeing if call handling systems and software would be able to cope with a huge demand in service, potentially a 200% rise on traditional call volumes. Edwardson stressed this was only a potential figure, and not something that was hard and fast, but that it was a good idea for Trusts to be aware of the technology they had in place and find out from the providers what levels it could operate to. Furthermore he stressed the fact that the ambulance sector could see its workforce reduced by 30-50% in a flu pandemic and this would have a dramatic impact on their ability to respond to calls.

Talking on behalf of Jennifer Cole from the Royal United Services Institute (RUSI), Anthony McGee outlined Cole's work on interoperability research, regarding information sharing and security, and the work RUSI was doing since its last study, conducted shortly after 7/7, to find out if communications between the emergency services had improved since then, and how they could be further improved. McGee stressed the report was not designed to only highlight flaws or improvements that could be made, but was also interested in hearing about the positive improvements in the communications arena of the emergency services. Anyone with information, thoughts, view and opinions on this area should get in touch with RUSI by contacting Jennifer Cole at jenniferc@rusi.org.

The final talk of the day centered on the issue of Ofcom and the concerns that exist over the current way in which the emergency services have to compete with other public and private sector organisations for spectrum. Ian Readhead gave the talk on behalf of David Happy from Aanonxe Ltd, and outlined his view of the problem with the current spectrum allocation system: "The idea that the

"I don't blame Ofcom, but it does rather reinforce my belief that the current process is broken and legislation may well be needed to fix this before something more serious occurs – for it is only a matter of time, and the UK has capacity problems right now."

➲ *David Happy, Aanonxe Ltd.*

"The idea that the emergency services should be considered the same as other organisations, who don't provide life saving services, is morally, ethically and politically absurd."

Ian Readhead, former President, BAPCO.

emergency services should be considered the same as other organisations, who don't provide life saving services, is morally, ethically and politically absurd".

He went on to explain that as it currently stands Airwave buys spectrum from Ofcom, which it then sells on to the police, who pay Airwave with the money they have been given by the government in the first place. Readhead called on those present to join the call on government to review this legislation and to limit Ofcom's role in a field where they already accept and agree they do not have the requisite expertise so that people are not needlessly placed in danger. It must be understood that the spectrum needed by the emergency services should not be jeopardized by having to compete for spectrum based on economic theory that is being over-zealously interpreted by some who only wish to allocate resources spectrum via auctions. This ignores totally wider societal duties, the principal one of which is the protection of its citizens.

Readhead pointed out that Ofcom has said in the past if the police were just given the spectrum, they would ask for more than they needed, which Readhead dismissed by saying the emergency services had no need for any more spectrum than they genuinely needed to carry out their roles. There was also reference to the length of time it has taken for Ofcom to issue additional spectrum to Airwave for the 2012 Olympics, suggesting again the need to understand the requirements of the emergency services, which should be considered independently of other public bodies not providing life-saving services. Readhead urged those in attendance to help support this growing argument by using the influence they had to help increase the pressure on Ofcom to be far more flexible when dealing with the needs of the emergency services for spectrum.

At an earlier Coventry Roadshow, where David Happy was in attendance, he observed that he saw no quarrel between the Parties, just a process that did not work properly, and which led them towards disputes by default. "What is needed is common sense, clarity, calm reflection, and new legislation, or the current problems will be exacerbated. The skills are there, let us hope the will is too – or when the emergency services make a future request shortly for more spectrum for broadband secure resilient capacity we could find ourselves in a catastrophic position." He also observed that Lord West had recently in the European Council endorsed the recommendations of the Police Cooperation Council that an attempt be made to reserve a portion of the "digital dividend spectrum" for broadband emergency service applications, "but Ofcom did not know this and in no documents from them can I find reference to it. I don't blame Ofcom, but it does rather reinforce my belief that the current process is broken and legislation may well be needed to fix this before something more serious occurs – for it is only a matter of time, and the UK has capacity problems right now."

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BAPCO

British Association of Public Safety Communications Officers

MEMBERSHIP APPLICATION

1. PERSONAL DETAILS

TITLE	
FORENAME(S)	
SURNAME	
POSITION HELD	
ORGANISATION	
MAILING ADDRESS	
POSTCODE	
BUSINESS TELEPHONE	
FAX	
HOME ADDRESS (If different from above)	
POSTCODE	
EMAIL	

I agree to BAPCO sending information to me regarding its events, products and services. BAPCO will not pass on any information to other companies or third parties ❑

2. CATEGORY OF MEMBERSHIP APPLIED FOR

ACTIVE ☐ ASSOCIATE ☐ COMMERCIAL ☐ INTERNATIONAL ASSOCIATE ☐

OFFICIAL ORDER NO

Please send further details of Corporate Membership ❑

3. ORGANISATION TYPE

Please tick one item that best describes *your* organisation

PUBLIC SECTOR AREA SERVED		ORGANISATION TYPE		COMMERCIAL	
Parish	☐	Law Enforcement	☐	Manufacturer	☐
District	☐	Fire / Rescue	☐	Distributor	☐
County	☐	Ambulance / Medical	☐	Dealer	☐
Regional	☐	Emergency Management	☐	Maintenance	☐
National	☐	Local Authority	☐	Consultant	☐
Private	☐	Central Government	☐	Network Provider	☐
Other	☐	Public Utility	☐	Training	☐
		Other	☐	Personnel	☐
				Other	☐

BAPCO MEMBERSHIP APPLICATION

BAPCO
British Association of Public Safety Communications Officers

4. POSITION RESPONSIBILITIES

Please tick the item that best describes *your* responsibilities in each area:

POLICY & PROCEDURE

- ❑ I approve/develop policies and procedures
- ❑ I oversee implementation
- ❑ I have a limited role in implementation
- ❑ I do not have a role in implementation

PURCHASING

- ❑ I approve purchases of products and services
- ❑ I select specify products and services
- ❑ I recommend products and services
- ❑ I do not have a role in purchasing

PERSONAL TRAINING

- ❑ I approve training programs
- ❑ I develop/purchase training programs
- ❑ I implement/teach training programs
- ❑ I do not have a role in training

5. MEMBERSHIP CATEGORY & FEES (Select One)

☐ **ACTIVE MEMBER**

Persons employed or contracted by a public safety agency or a department of central or local government responsible for the provision of public safety services, or are retired from such a position, who are directly responsible for, or retired from, the management, specification, design, installation, maintenance, operation and use of public safety communications and information systems, are eligible for this category of Membership

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£40.00 per annum

☐ **ASSOCIATE MEMBER**

Those persons, who otherwise meet the requirements of Active Membership, may, at the applicant's discretion, select this category of membership, and, those persons not meeting the requirements of any other category of membership that share the Purpose and aims of the Association, are eligible for this category.

£28.00 per annum

☐ **INTERNATIONAL ASSOCIATE MEMBER**

Persons who are not citizens of the United Kingdom that share the purpose and aims of the Association are eligible for this category of membership.

£50.00 per annum

Details of Corporate Membership can be obtained from: ExecD@bapco.org.uk

6. PAYMENT INFORMATION

Total amount due £ _____

- ❑ Individual or
- ❑ Organisation is paying for Membership.
- ❑ Personal cheque enclosed.
- ❑ Official purchase order No. _____ enclosed.

7. OPTIONAL INFORMATION

How did you hear about BAPCO?

❑ Co-worker ❑ BAPCO Journal ❑ Sponsor

❑ Other _____

Gender: ❑ Male ❑ Female

Date of Birth: Day_____ Month_____ Year ____

8. APPLICANT'S STATEMENT

I hereby apply for membership in the appropriate class of **BAPCO,** and agree to abide by the Constitution and Bylaws of the Association. I understand that by joining I also become a member of the BAPCO region serving my area and that my subscriptions are payable annually, based on my first day of membership.

SIGNATURE _____ **DATE** _____

TEL: 01522 575542	WHEN COMPLETED PLEASE FORWARD THE WHOLE FORM (WITH APPROPRIATE ENCLOSURE) TO: BAPCO, PO BOX 374, LINCOLN LN1 1FY	FAX: 01522 575542 (Remember to fax both sides of the form)

FOR OFFICE USE ONLY

RECIEVED
REGION
MEMBERSHIP No.

CERTIFICATE SENT
RENEWAL DATE

BAPCO

THE BRITISH ASSOCIATION OF PUBLIC SAFETY COMMUNICATION OFFICERS

Notice of Annual General Meeting

Notice is hereby given that the 17th Annual General Meeting of BAPCO Ltd will be held at 1615 hours on Wednesday 21st April 2010 at the Business Design Centre, Islington, London.

Candidates and nominations for Elected Office (which must be formally proposed, seconded and agreed by the nominee) from the Active Membership classification should be submitted, before midnight on 10th March 2010, in writing to:

The Executive Director,
BAPCO Ltd, P.O. Box 374,
Lincoln, LN1 1FY

Ray Trotter,
Executive Director, 1st January 2010.

AGENDA

1. **Minutes of the 16th AGM held on 22nd April 2009**
2. **Matters Arising**
3. **Report of the Executive Committee for year ending 31st December 2009**
4. **Financial Report for Fiscal Year 2009**
5. **Resolution to Amend Constitution and Bye-Laws**
6. **Nominations for Life Membership**
7. **Election of Officers for 2010/2011: (i) President Elect: (ii) Vice President**
8. **Business Plan for 2010**
9. **Budget for 2010**
10. **Annual Subscription rates for 2010/2011**
11. **Appointment of Solicitor**
12. **Appointment of Accountants**
13. **Any other Business applicable to an AGM.**

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Executive Member: Brian Carlin
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☎07905 656403

Delivering resilience

Satellite broadband delivers resilient communications, writes David Savage, Founder and CEO of Excelerate Technology.

Excelerate Technology is now starting to equip mobile ICUs and personnel with FAST-mask®, a new positive pressure breathing apparatus. Top: Gwent Police's ICU provides a tactical silver command solution. Below: West Midlands' new Mobile Emergency Operations Centre.

Whether on land or at sea, satellite broadband delivers reliable and resilient communications in locations where traditional GSM and terrestrial networks are unavailable due to geographical or coverage constraints, network overload or even failure. It provides access to high speed broadband services enabling real-time voice, data and video information to be shared with Gold Command to achieve a common operating picture regardless of location.

Founded in 2001, Excelerate Technology has become the leading supplier of voice, data and video solutions to the emergency services using satellite and wireless-based technologies as a direct result of its extensive operational expertise and proactive approach to working in partnership with clients on every project. The company also maintains close working relationships with leading specialist coach builders which have been key partners in delivering a wide range of mobile incident command units and rapid response vehicles that are now in daily use by police, fire and ambulance services across the UK.

Excelerate Technology is the exclusive technology supplier nationally for the Dpt. of Health's HART programme, which is delivering a new generation of civil contingency vehicles. Throughout, Excelerate has actively recommended innovative approaches that would provide a comprehensive, joined up operational picture of all functions associated with major incidents and enable command decisions to be clearly and effectively communicated. HART vehicles have already been deployed at many major incidents including the recent floods in Cumbria.

Excelerate's commitment to designing and delivering solutions that meet the requirements of its customers is appreciated by many. According to Nick Smith, Group Manager at West Yorkshire Fire and Rescue Service, which is about to take delivery of a new command vehicle: "Our new command unit was developed in partnership with Excelerate Technology who provided important advice on the technologies that would deliver the greatest operational benefits. It will empower commanders to make faster, more effective decisions and enhance the management of major incidents throughout West Yorkshire."

This view is supported by Simon Leonard of Gwent Police, which recently unveiled what is almost certainly the most advanced mobile ICU to be ordered by the UK's police service to date. The vehicle provides a tactical silver command solution to ensure preparedness for all civil contingencies throughout the region and will also be deployed at public events such as the Ryder Cup and the Ebbw Vale Eisteddfod. He commented that: "We worked hand in hand with Excelerate Technology to develop an overall solution that has met all our tactical, strategic and technological requirements within available budgets. We are extremely proud of our new mobile ICU which will enable us to better serve our local community and improve public confidence in our work."

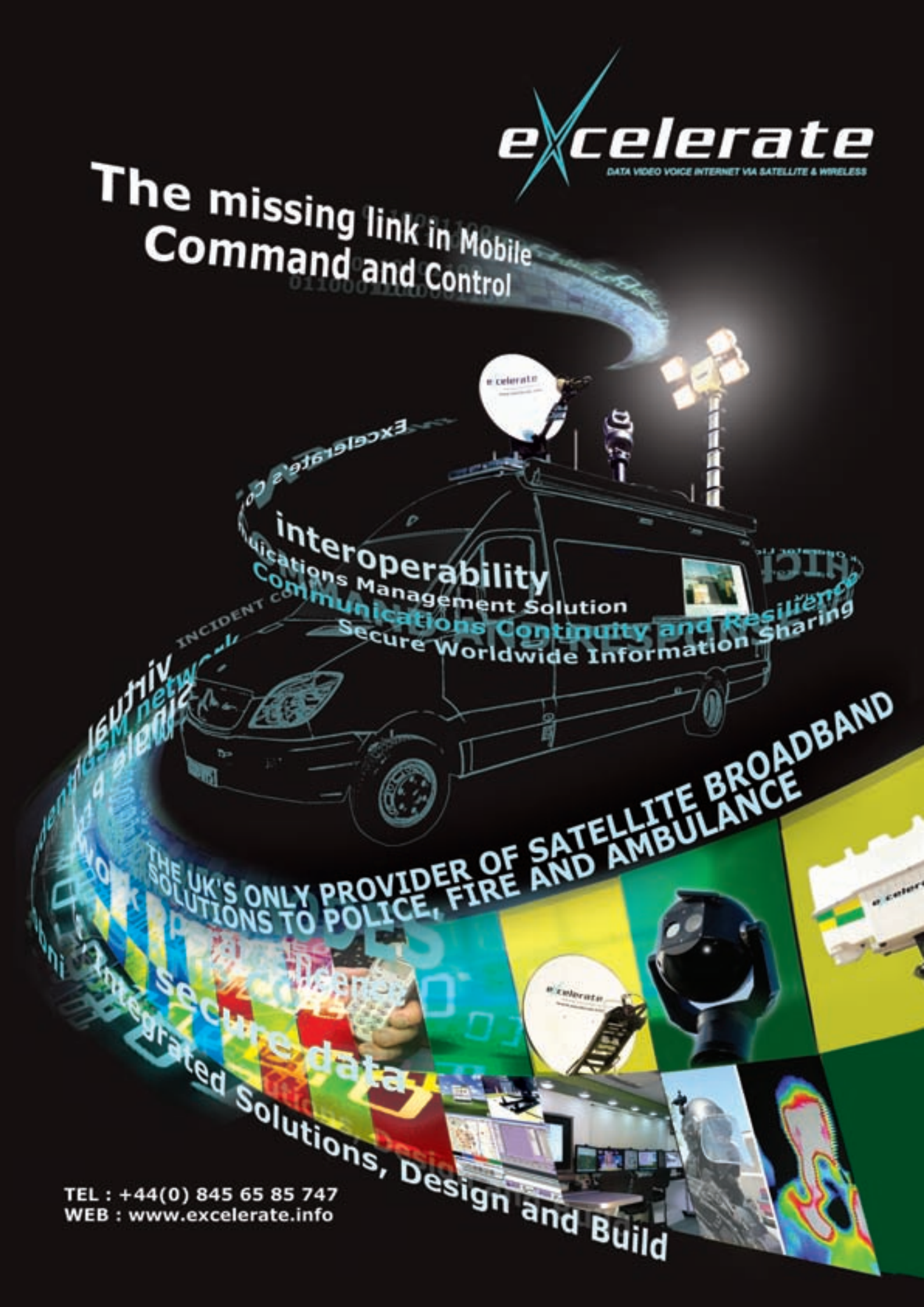
Excelerate has also provided West Midlands Ambulance Service Trust with a new Mobile Emergency Operations Centre (MEOC) to further improve resilience and help achieve interoperability with other emergency services during major incidents. According to Daren Fradgley, Regional Head of Emergency Operations Centres at West Midlands Ambulance Service Trust: "The new MEOC allows us to set up a robust series of command and control arrangements at any incident allowing seamless communications and live streamed pictures where appropriate both night and day to Gold Control and any EOC around the Region.

Protecting key personnel

However, it is a fact that all this technology could be of little use if operators are incapacitated as a result of HAZMAT or CBRN incidents. Excelerate Technology is actively engaging in the wider area of operator health monitoring and protection to ensure continued operational effectiveness and is taking the same innovative approach that has already helped the company achieve so many technology firsts.

To provide the highest level protection, mobile ICUs and personnel are now being equipped with FAST-mask®, a new positive pressure breathing apparatus. This new mask is safer and delivers significantly higher levels of performance than commonly used escape breathing apparatus sets that are still based on national standards and designs from around 30 years ago. It automatically deploys to be operational within three seconds when needed and is expected to become an essential part of HAZMAT kits carried on mobile ICUs.

For more information call 0845 658 5747, email nicolas@excelerate.info, or visit www.excelerate.info.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Towards a new dawn

This year BAPCO's 12th international conference will focus primarily on the future of ICT and communications, taking in the implications for public safety, disaster relief, and resilience, in the light of a challenging economical and political climate.

BAPCO 2010 – the only exhibition in Europe organised by public safety/ civil contingency response users.

The dual stream conference format will deliver more variety and a greater choice of topics and sessions for practitioners to choose from. Emergency planners will be able to explore topics such as: "The future post 2014 – what does it hold for next generation ICT networks and applications?", and whether there are: "alternative, more efficient ways, to achieve cost effective service delivery."

The event has also been re-branded for 2010. The new branding for the event more closely aligns it with the BAPCO organisation and can be seen at the new event website www.bapco.co.uk.

BAPCO 2010 is the only event in Europe that is organised by public safety/civil contingency response

Exhibitors – who will be there:

- 3tc Software Ltd
- *ABIOM
- Advance Charger Technology /ETPS Ltd
- *AECOM Design
- Airwave
- Analysys Mason
- APD Communications
- Arqiva
- Autopage Ltd
- Axess International Ltd
- Blackberry
- Brother UK Ltd
- Cadcorp UK Ltd
- *Cleric Computer Services
- Cybertech UK Ltd
- Cyfas Systems Ltd
- *Damovo UK Limited
- DataNet Radio
- Emergency Services Times/Fire Times
- Eptheca Global Ltd
- Ericsson Ltd
- Excelerate Technology
- FB Peripherals
- Fischer Connectors Ltd
- Fortek
- Frequentis AG
- Genesis
- Ham Associates Ltd
- Helimedia Ltd
- Hub Systems/Data 911
- Imass Ltd
- Infomatrix
- Intergraph
- Itrinegy Ltd
- *ITT Defence Ltd
- Jane's Information Group
- Leeds University Business School
- Lowe Electronics
- Microbus Mobile Data
- Motorola Ltd
- NDI Technologies
- NICE CTI Systems Ltd
- Northrop Grumman
- PageOne Communications
- PMR Products
- *Polyphaser c/o Microwave Marketing
- Priority Dispatch Corporation
- Public Sector Publishing
- Radio Telecom Services
- Red Box Recorders Ltd
- *Secricom Project
- Sepura Plc
- Simunix Ltd
- *Skymasts Antennas Ltd
- Sonic Communications
- SunGard Public Sector Ltd
- Syntech Systems
- Systemslink Two Ltd
- Tait Radio Communications
- Telent
- Tempus Computers Ltd
- Terma A/S
- Terrafix Ltd
- The BAPCO Journal
- Traka Plc
- VectorCommand Ltd
- Voice Recorders LTD
- *Wireless

* New exhibitors for 2010.

users for users and is recognised as a vocational training opportunity that can count towards CPD points and ongoing training. Keynote speakers from the UK and overseas will present real-life case studies, providing the latest information, support and solutions to the challenges currently facing emergency planners. The full conference programme is available to download now from www.bapco.co.uk.

Alongside the conference, emergency services and local and national governmental agency professionals visiting the exhibition can meet firsthand with consultants and suppliers of the current and future technologies that will shape their operations. Over 100 suppliers will offer expert advice on the use, implementation and management of communications equipment and information management technologies and preview future technologies that will shape operations.

The BAPCO Conference and Exhibition will take place at the Business Design Centre, Islington, London, 21- 22 April 2010. Register now at www.bapco.co.uk.

WHAT'S HOT – *A PREVIEW FROM THE EXHIBITION FLOOR*

PageOne's 2-way pagers now MTPAS enabled: stand 427

Cabinet Office approved, PageOne 2-way pagers are now exclusively MTPAS (Mobile Telecommunication Privileged Access Scheme) enabled giving greater benefits to Category 1 and 2 Responders in the event of a public emergency. Unlike MTPAS voice enabled mobiles, which are restricted within such organisations, PageOne's 2-way pagers are available to all Category 1 and 2 users. The Cabinet office have also given special dispensation for organisations presently excluded from the Category 2 list, but who respond to major incidents.

With a range of features including location-based services, a 2-way reply option and real-time message read status, PageOne's 2-way pagers provide users with essential intelligence necessary to make informed decisions about the coordination of resources. Robust, resilient and reliable; PageOne's 2-way paging platform can really help organisations improve the effectiveness of their operational and incident management processes. For more information on PageOne's 2-way pagers or any other services, contact us today on 0844 811 0070 or visit www.pageone.co.uk

Sonic Communications' new developments: stand 440

Sonic Communications regards BAPCO as the ideal platform to showcase and demonstrate its latest developments in an ever expanding product range for the professional user and this year will be no exception!

Following on from last year's overwhelming interest in wireless RCU functionality, we have continued with this and now offer various levels of wireless functionality to all users from Covert through to Firearms and Motorcyclists etc.

Also being demonstrated will be our latest covert wireless earpiece(s). We have 2 new models to unveil in the form of 'LD5digital' and the 'Micro digital' both of which feature the latest DSP technology to minimise unwanted noise.

Come and visit us on Stand No: 440 to view and discuss all of your TETRA/Analogue Accessory and Vehicle Installation requirements. For more information please do not hesitate to contact us on 0121 781 4400 or email sales@sonic-comms.com

Promotional feature

Get with the Interoperability Programme

Detective Chief Superintendent Michael Hallowes, Head of Strategic Operations, NPIA, urged people to embrace the NPIA's Multi-Agency Interoperability Programme during his presentation at the Emergency Services Show. Special report by Isabella Franco.

Michael Hallowes's presentation was titled: "Improving Preparedness – Communications on Interoperability, the Vital Link".

Michael Hallowes began by outlining the key objectives of his talk: to encourage responder agencies to engage with the Multi-Agency Interoperability Programme, and to urge people to use Airwave technology for voice communication. "Why are they so important? Emergencies and crises are often characterised by uncertainty. Providing commanders quickly with an accurate assessment of the totality of the events is critical to the effectiveness of their decision-making. Interoperability, and in particular communications interoperability, is the vital link to achieve this."

Hallowes went on to illustrate how few Local Resilience Forums had embraced the IBIS (Interim Bronze Interoperability Solution) Airwave radios. These are the 1,600 extra Airwave handsets bought by the Government in 2006 and distributed to every police force. IBIS was intended to prepare the ground ahead of the Ambulance and Fire and Rescue Services completing their own rollouts of Airwave by April 2010. The objective was to provide resilient radio communications between the emergency services when required at incidents to which they all responded. Analysis of call data records indicates less than 50% of forces have made use of the capability – Hallowes partly attributes this to individuals who are holding on to old conventions that rely on face-to-face communication rather than embrace the capability to stay informed remotely by using new technologies. Technologies available today, and already bought by each of the emergency services, could be used more effectively as tools to help exchange information and enable commanders to collaborate on decision-making. With the Olympic Games coming up in 2012, it is of the utmost importance that new technologies that improve collaboration and co-ordination between the emergency services become integrated into the response procedures as soon as possible.

What is required is top-down leadership: "to bring about the necessary improvements to people, processes and systems, enabled by technology, to prepare us for the inevitable challenges ahead."

FAST-mask, the new breathing apparatus by Excelerate (see opposite page).

Lessons learned from past events, both nationally and internationally, have provided clear examples of where available technologies can and should be used to improve information management through enhanced comms interoperability. This should be in the context of an all-hazards approach that improves communications between commanders in the emergency services in their collective response to both man-made and natural disasters.

Hallowes talked about the aims of the Multi-Agency Interoperability Programme and was keen to highlight the importance of interoperability becoming second-nature: "One of our priorities for the programme is to build confidence in those entrusted with command and also to help front-line responders embrace new technologies as command-decision support tools and for them to reach for them instinctively."

In order to facilitate this, the NPIA has published the *Guidance on Multi-Agency Interoperability* that explains its essential principles, enabling commanders to integrate these practices and procedures into the decision-making process, and supports the significant investment made by the government to provide these latest technologies.

One of most significant outcomes of successful interoperability is the common operating picture (COP). This is the availability of information critical to decision-making drawn from six generic data sets that provides commanders from the three emergency services and partner agencies with a common understanding of the situation faced. These data sets involve: imagery; mapping; information of hazards; briefings and essential messages to the public as well as front line personnel; decisions and event logs, and critical radio messages.

Plans are in place to evaluate the National Resilience Extranet as a vehicle for delivering the COP to enable responders to make decisions based on the most complete, up-to-date, accurate and consistent information available. This, in turn, will lead to: improved safety both for the public and responders, increased operational resilience, increased confidence amongst emergency service, and

improved collaboration and co-ordination.

The COP is particularly critical during the so-called golden hour – those first 60 minutes where the decisions made provide the foundation for the effectiveness of the response that follows. If that response is based on inaccurate or incomplete information, time is wasted undoing the mistakes already made as well as remobilising and remodelling an effective response. Hallowes used the events of July 2005, where it took a costly 63 minutes to establish that what was occurring was not an electric sub-station explosion but in fact a simultaneous, multi-seated terrorist attack, as an example of the necessity for the COP.

We must not forget, however, that communications interoperability is not limited to voice communication; the ability to exchange data such as maps, imagery or text to "show me" rather than "tell me" is also vital in gaining a common understanding of the situation and has been shown to reduce radio traffic by up to 30%.

His closing words were a final push for the Interoperability Programme: "Effective interoperability between commanders and managers in our responder agencies is vital to improving preparedness. It's now time for the leadership to embrace innovations in enabling technologies and remove the last barriers of outdated conventions. Energy needs to be put into developing compatible and interoperable voice and data capabilities that feed the common operating picture. We need complementary standard operating procedures and training so our people grow in competence. That way we can take full advantage of the communications Utopia that I believe is readily achievable. The public expects us to do so and we owe it to our frontline responders to make it so. I welcome your support and together I trust we can achieve our objective of unifying communications for a safer response."

"I welcome your support and together I trust we can achieve our objective of unifying communications for a safer response."

Launched at the Emergency Services Show...

The Emergency Services Show or the Emergency Gadgets show? Who knows, who cares? Here are just some of the communications highlights that caught our eye.

ICUs Excelerate with FAST-mask

Excelerate Technology introduced FAST-mask, a new positive pressure breathing apparatus comprising an automatically inflating head harness that enables it to be safely donned and fully operational within just three seconds, providing immediate protection in a wide range of HAZMAT and CBRN applications.

The silicone mask automatically tensions to form a seal without having to adjust any harness straps or buckles and switches the demand valve regulator to positive pressure.

David Savage, CEO of Excelerate Technology, commented: "It will form an essential part of the HAZMAT kits being carried on mobile incident command units that are increasingly being deployed by police, fire and ambulance services across the UK, perhaps thanks to us even one day being built into a vehicle and automatically deployed when needed. Although the market sees Excelerate as the market leader in the provision of data, video, voice and Internet applications via satellite we are totally immersed in the whole design and build process with incident response vehicles and this is now including how better to protect their human occupants, after all technology is of little use if their operators are incapacitated. We intend to engage in a wider area of operator health monitoring and protection but we will shake things up a bit by approaching things as usual from a higher tech angle."

Wireless bodyworn cameras

The new device from 802 Global uses the latest wireless technology to deliver real time incident-ground pictures from bodyworn cameras to remotely located receiver units – even in non line-of-sight environments.

The 802 Global Samix Camera System comprises of two elements, the COFDM Video Transmitter (CVT) and the COFDM Video Receiver (CVR) unit. Images can be relayed from the CVT directly to a CVR unit where they can be viewed by other responder personnel such as sector commanders. Images can also be sent via radio mesh to the incident command unit. In turn, images can be further distributed using satellite technology to remote locations.

Recording of all bidirectional calls in a private network

Developed by Private Mobile Networks (a division of TeleWare Group) and Primetech, this private and secure mobile network is totally independent of any established public network, and can be deployed within five minutes even in hostile environments.

The network allows internet access, activating the local GSM network (to over two miles when used in conjunction with Primetech's ICSN auto meshing w-fi network) and re-establish communications beyond the perimeter of the incident.

Any voice communication that passes through the network, irrespective of where it originated, can now be recorded. According to Henry Walker, Director of Primetech, the advantage of this new technology is the provision of a full audit trail of conversations.

It is envisaged as an ideal solution to support remote and rapid deployment situations as no remote recording equipment is needed.

Megaphone

STG Media Systems has launched what it describes as "our loudest, clearest, most portable megaphone ever".

The battery operated, lightweight (7.5kg) MV-LSA-1580P from STG Media Systems has been specifically designed for crowd control, demonstrations and evacuations. Cleverly, it features in-built safety switches that prevent unauthorised use of maximum volume, and it also has adjustable outputs and a remote control option.

The handheld megaphone has a UFH wireless microphone range of <150m, and an SPL (sound pressure level) of 136dB at 1m. It also includes an output for a personal radio or recorder, and inputs for an MP3, as well as the voice translation system Phraselator.

Preparing the public for wide-scale evacuation

Susan Anson and Duncan Shaw from The Aston Centre for Research into Safety and Security (Aston CRISIS Centre) introduce a six-step framework for government agencies to consider to encourage the public to be better prepared for evacuation.

Susan Anson is a Researcher on the ERGO Project and a PhD student using social marketing theories. Email: s.c.anson@aston.ac.uk.

Dr. Duncan Shaw is Professor of Operational Research and Critical Systems and is Director of the Aston CRISIS Centre. Email: d.a.shaw@aston.ac.uk.

Major catastrophic incidents may require large portions of the public to quickly evacuate to a different location for their safety. However, due to their limited experience of wide-scale evacuation the public are not generally conditioned to respond to such evacuation orders, which may hinder the efforts of government agencies to conduct an orderly, safe and swift evacuation. Thus, the public being well prepared provides benefits for them and for emergency planners responsible for coordinating an efficient evacuation.

As part of the EU-funded ERGO Project (Evacuation Responsiveness by Government Organisations, www.ergo-aston.eu), we are developing a framework that government bodies may use months/years before an evacuation is called to effectively prepare the public for mass evacuation. The framework was created using social marketing principles and insights gained from approximately 100 interviews in eight countries with senior representatives of government organisations, first responder agencies, support organisations and NGOs.

Social marketing is concerned with behaviour change for social good (http://www.nsmcentre.org.uk/what-is-social-marketing.html) and has been adopted by the UK government to change health related behaviours such as stopping smoking. Below we introduce the 6 step framework that government agencies may consider to encourage the public to adopt behaviours that strengthen preparedness for evacuation, such as storing resources, creating plans or becoming familiar with local/regional plans. However, such preparations may come at a cost to those preparing e.g. the financial cost of buying resources; the time spent searching for information on evacuation routes; the stress caused by fear arousal.

Step 1

Review all previous and current attempts to prepare the public for mass evacuation. This maps the terrain, ensuring future actions are informed by current/past activities. As expected, we found countries participating in the ERGO project differ in the extent to which they prepare the public. Most countries recognised that all members of the public can not be targeted in the same way and so target segments differently depending on their geographic location or demography. The use of schools and/or communities in preparing the public had been adopted in the majority of countries.

Only Japan conducts audience research to better understand their target audience. *A questionnaire was sent to 5,000 members of the public and 4,000 companies with a respective response rate of 47% and 44%. The findings inform revisions to the disaster response plan and the development of preparedness brochures.

Step 2

Identify the target audience to prepare for mass evacuation. This may stretch beyond school children and families to include the vulnerable, harder-to-reach groups and established communities. Six countries target the public based on their geographic location and/or demography. Iceland's emergency preparedness website contains information in Polish as well as Icelandic, while interpreters speaking Lithuanian, English, German and French are included in exercises.

In Germany, Hamburg residents receive a hazard map that is relevant to their locale and which is available on the preparedness website in English, Turkish, Slavic, Croatian and Polish.

Step 3

Agree goals for preparedness of target audiences. Based on previous attempts and the target audience (Steps 1&2), setting goals for your preparedness campaign will clarify the ambition, help evaluate the merits of potential activities and can be used for evaluation purposes. For example, the UK conducted a campaign to increase awareness of their preparedness website. In Japan, the focus was to encourage the public to store a minimum of three days food, water and medicine. Iceland wanted the public to develop their own plans to help themselves should an incident occur.

Step 4

Research the target audience to understand the people whose behaviour the social marketing campaign is designed to affect. Data collection tools such as interviews, focus groups or surveys can be used to engage target audiences to identify how familiar they are with mass evacuation eg what they already know, what they need/want to know and what they consider are the benefits/costs/barriers of preparing. Understanding the target audience allows the social marketing campaign to address these effectively. Our research found that Japan is the only country that conducts research to better understand their target audience as outlined in Step 1*.

Step 5

Identify how to deliver high-impact preparedness information. Governments can also create new services/products to support the public in their preparations. For example, the UK's Environment Agency provides a service called Flood Warnings Direct which provides warnings to the public by telephone, mobile, email and fax (http://www.environment-agency.gov.uk/homeandleisure/floods/38289.aspx). Denmark provides a similar service, where the hearing impaired may register to receive information by SMS once an incident occurs. In Sweden there is an information centre which the public can contact to receive emergency preparedness information. Governments may create campaigns attempting to reduce the costs to the public of preparing. For example, Belgium aimed to reduce the public's time cost by providing local authorities with checklists of what the public can prepare ready for evacuation. In Sweden, residents near a nuclear site are saved time in having to locate their own iodine tablets by being sent information packs which contain them. However, we did not find examples of attempts to reduce the psychological and financial costs to the public. Psychological costs may be reduced by promoting the benefits of preparing to the public such as a reduction in injuries. To reduce the financial cost of preparing governments could work with sellers of emergency preparedness supplies to offer discounts and incentives to the public – as has been done in the UK with personal attack alarms. Table 1 illustrates the types of messages we found across the eight ERGO countries and how they are sent to the public.

Step 6

Monitor and evaluate the preparedness campaign. The goals initially set can be used to evaluate whether the campaign was successful. Changes to public behaviour, knowledge or beliefs may be measured through surveys, focus groups or interviews. As mentioned above, the UK aimed to increase the number of visitors to their emergency preparedness website – resulting in website traffic increasing by ~45%. Preliminary findings suggest that the UK is the only ERGO country measuring changes in public behaviour however most countries carry out monitoring and evaluation in some form. Germany, Sweden and Denmark actively monitor the number of visitors to their preparedness website. Activities also include evaluating communications during exercises (Sweden, Belgium and Denmark), monitoring press articles (Sweden and Belgium) and conducting research to identify whether the public have received communications material (Germany and Sweden). This framework is continuously being developed as our data is further analysed and academic literature is reviewed. Feedback from the countries will refine the framework to ensure it can be implemented by those who prepare the public for mass evacuation. We welcome comments from readers on how their organisation is preparing the public.

About the ERGO project: We are working with 8 countries in a three year EU-funded project. In addition to public preparedness, we are building analytical (quantitative) models of evacuations in a city (using agent-based simulation methods) as well as developing a decision making model for calling an evacuation.

Table 1 – Examples of "preparedness" messages and how they are sent to the public by the ERGO countries.

"Preparedness" messages

- Information about the risks and what will happen
- How the public will be informed that they need to evacuate
- What to do and how to behave in response to key signals e.g. sirens
- What to take when evacuating such as medicine, passport, and what to leave at home
- Where to go e.g. location of emergency accommodation
- How to get further information or help
- What the government agencies are doing to protect the public
- In the case of evacuation to think about informing your neighbour / vulnerable groups
- Messages about children and pets

How messages are sent

- Internet websites
- Printed materials – leaflets, brochures, booklets, telephone directory
- Outdoor signage, posters
- Call centres
- Presentations
- Bus stops with signs indicating it is an evacuation collection point
- Special Newspapers
- Billboards in libraries
- Promotional Materials – mugs, calendars, cards
- Information in the Press
- Radio

Preparing for lift-off

With the first contracts for Galilleo procurement signed at last, the initial deployment of Europe's satellite navigation system is set for early 2014. Galileo will bring a guarantee of reliability and more accurate positioning for the emergency services, as Jon Severs finds out.

Artist's impression of GIOVE-A in orbit (photo: ESA - P. Carril). Right: the Soyuz-Fregat launch vehicle carrying GIOVE-B, the second of ESA's two Galileo in-orbit validation element demonstrators, in the final minutes before lift-off from Baikonour spaceport, Kazakhstan. (Photo: ESA – S Corvaja.)

GPS technology has been so reliable and is now so prevalent, that to have it disappear would almost be unthinkable. But the threat of losing GPS capability is a real one, as it is owned by the US military and it is within its rights to hit the off switch whenever it suits.

This is one of the reasons why Europe is launching its own, civilian, global positioning system, called Galileo. The project is under the stewardship of the European Space Agency (ESA) and it is hoped Galileo will be up and running by 2014, providing not only a reliable satellite navigation network, but also a host of new possibilities for users. However, for the emergency services, it is debatable how far its launch will improve every day practices or bring benefits in the form of new applications.

At present, emergency services use GPS mainly for the tracking and deployment of units. These units then also use it for navigational purposes. Hence, it is an integral part of the emergency services day-to-day practice. Tareq Khamis, managing director of Prime Satcom Consulting, explains that the threat of losing this service on the whim of the US military is real and one that has hindered development of GPS applications. "Galileo makes GPS more reliable because it is civilian, not military," he says. "One thing that has often stopped people using GPS in the past is the risk that it could be switched off. It is very difficult to rely on something, especially for emergency services applications, that you cannot guarantee will be in place and working. Galileo gives the guarantee of reliability so investments that have not happened may now happen as a result."

This guarantee of reliability comes alongside the promise of improved coverage due to the high number of satellites that will be operational. It is argued by the ECS that coverage in high-rise, built-up areas of cities will be better, as will coverage at higher latitudes.

ESA also claims accuracy will be vastly improved compared to the military owned GPS and GLONASS systems currently in operation, though Galileo will be fully interoperable with both. ECS says positions will be able to be determined within a few centimetres with Galileo, while most commentators put GPS and GLONASS accuracy at around 3-15m, depending on conditions.

Martin Worrell, technical manager at APD Communications, has doubts as to whether this improved accuracy will benefit the GPS products he supplies to emergency services, including the Inca tracker system. "Galileo will give us greater accuracy as there are more satellites as part of the system and these satellites are better positioned to give greater and better coverage. However, in our industry, it is unlikely anyone will be massively affected by it. For instance, for the tracking of vehicles where the vehicle is sending a regular message back to the control room, which plots its position on a map, you wouldn't

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"I don't think anyone will spend any more upgrading purposefully to Galileo, apart from when it is part of the regular upgrades in service agreements. When Galileo comes out, our products after a period of time will be upgraded to use it, and it would be the same sort of price, I would imagine."

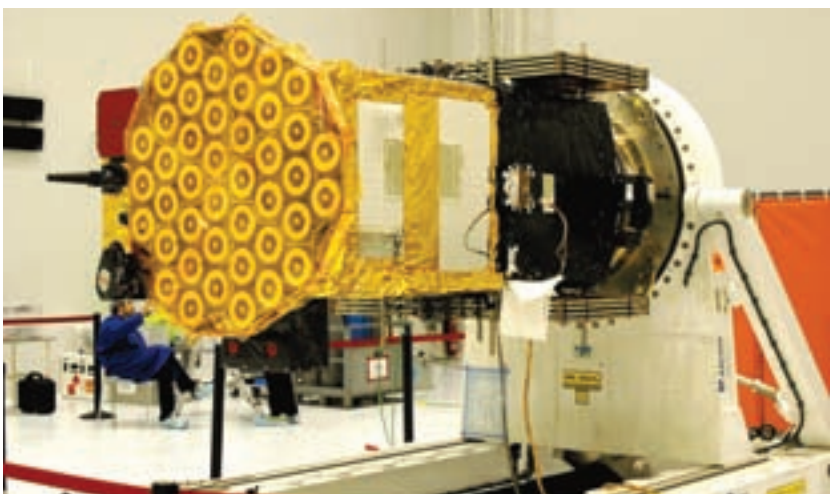
Martin Worrell, APD Communications.

expect Galileo to really bring much benefit. This is because going from 5-10m accuracy to 1m accuracy, when you're sending messages every couple of seconds anyway, is slightly irrelevant in this context really."

David Savage, chief executive of satellite broadband solutions provider Excelerate, disagrees, believing the accuracy improvement to be an advantage that will have an effect. "If you look at just vehicle positioning – where the computer knows where the vehicles are and displays it on a map and sends the closest unit to an incident – then this is standard already," he explains. "But a higher degree of accuracy for tracking and positioning will no doubt still be useful to the emergency services. Some may argue that it doesn't make that much difference, but even the general public, if given the choice of a more accurate service at the same price, will chose the more accurate option. Greater accuracy is to the benefit of everyone." Khamis agrees: "Having accuracy down to 2-3m is going to make the tracking of every police car in an area much easier, especially if you have a number of cars in the same place."

Worrell concedes that better accuracy may bring potential for better satellite navigation in that satnav systems will be able to tell, for example, which lane of the motorway you are in. But he does not think it will rectify one of the current problems police officers are finding with SatNav. An officer from the Hampshire Constabulary revealed that the in-car SatNav systems cannot keep up when travelling at high speeds, meaning turnings and destinations can be missed. "Galileo is unlikely to deliver the information to the SatNav unit any faster than with standard GPS," reveals Worrell. "It's not a matter of accuracy, but rather the speed at which the data being received can be used to direct the driver. If there is a place where this problem could be solved then I would look towards the software in the SatNav unit and consider how it could better predict in advance where the driver will be, and deliver directions in advance. An area that Galileo may help with is that it increases the chance of maintaining a positional fix when travelling at speed in an urban environment."

While he has reservations about the benefits of the accuracy and it's effect on SatNav, Worrell does believe the more advanced technology of Galileo has the potential to open up new applications: "While I don't believe Galileo will revolutionise emergency services navigation, it will encourage new applications that might be useful in that sector. For example, the surveying of accidents could be aided. You may be able to go to a crime scene and be able to record accurately where all the people, items, vehicles, everything, are placed. It would be a more exact and effective method of capturing the data."



GIOVE-B in the Starsem Payload Preparation Facility at Baikonur Cosmodrome in Kazakhstan. (Photo: ESA – P Müller.)

Khamis also believes there is a lot of potential for new emergency services applications on the Galileo system, though he warns: "it's hard to say what applications will be built around Galileo until it is fully up and running and that may be a few years yet." However, he points to the fact that time can be logged accurately through the system so that an accurate exact order of events can be established, avoiding reliance on several different watches at the scene, as a potential useful advance.

Indeed, the atomic clocks installed on Galileo are key to its positional accuracy. Accurate time is integral to accurate navigation as GPS works by measuring the time taken for a signal broadcast by a navigation satellite to reach a person, hence tiny fractions of a second can make big differences. The clocks on the Galileo satellites will resolve position anywhere on the Earth's surface to within 45cm.

Whether there is a demand from the emergency services for this type of service and the applications Khamis and Worrell describe, is debatable. David Savage believes the emergency services are not particularly looking for improved GPS capabilities, but are instead looking for advancements in non-satellite based areas. "We just see Galileo as another GPS-based system. In terms of people and asset tracking, we would want a level of technology for applications that GPS does not provide. By this I mean we want the capability for in-building location in 3D of emergency services personel in multi-storey buildings. We would like to build this into our solution."

There is also the issue of cost. Emergency services budgets are tighter than ever thanks to the recession, so a transition to a new satellite navigational system would have to make both commercial and financial sense – the benefits would have to be worth the money. APD's Worrell does not see an instant shift to Galileo from GPS if the service is up and running in 2014 as predicted. "I don't think anyone will spend any more upgrading purposefully to Galileo, apart from when it is part of the regular upgrades in service agreements. When Galileo comes out, our products after a period of time will be upgraded to use it, and it would be the same sort of price I would imagine. It will be, I think, a gradual natural changeover as and when new products are required and bought." Savage agrees: "You have to think about the commercial element. GPS has a multitude of platforms already built for it so the economies of scale are already in place. Devices are therefore extremely affordable now. But when they were originally introduced they cost thousands of pounds as they were low volume. So one fo the initial problems Galileo will face is the pricing of the devices. There is the danger that the cost could be prohibitive, but this may have been addressed already."

The interesting, or perhaps infuriating, thing about Galileo is the number of unknowns. The industry is split over the benefits of accuracy and reliability advancements to the emergency services, and the potential new applications Galileo could offer the sector are still in the abstract.

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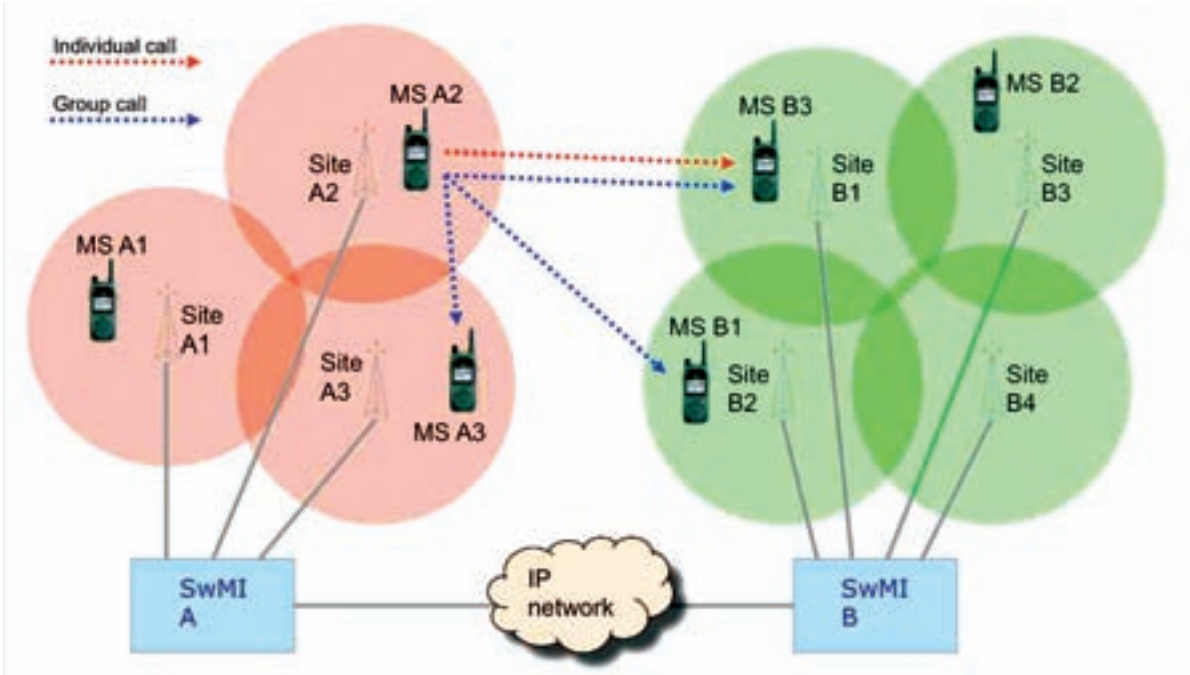


The power of ODINI

The On-Demand Intelligent Network Interface (or ODINI for short) is a solution to interconnect Private Mobile Radio (PMR) networks, both fixed and mobile, that support group and individual-oriented communications. ODINI is an interface based on a modern IP-based network architecture, which allows for integration of legacy, current and new radio networks, telephony and PC-based applications to support interconnection of voice and data calls. This whitepaper explains the usage cases for ODINI, the functionality offered, and the added value of ODINI in comparison to other solutions.

Scenario 1: tactical patch, cross-border cooperation of public safety officers.

Virtually all network solutions for professional mobile communications are based on proprietary system architectures. Although the air interface may be compliant with an open standard such as TETRA, the internal interfaces are not open for integration of products from other suppliers. End-users requiring seamless nationwide coverage cannot use equipment from multiple suppliers and therefore have to depend on a single supplier for all TETRA requirements. This results in a vendor lock-in, which unfortunately prevents system expansions, interworking between different networks and future migration to newer technologies.

The ODINI initiative is an attempt to remove the barriers of closed system architectures. Similar to the multi-vendor IP equipment market, ODINI allows interoperability between PMR systems, including TETRA networks, on the basis of open standards.

ODINI has been developed in close cooperation with end-users and independent system integrators. A significant number of end-users have been consulted, and a large number of interactive meetings have been held with public safety agencies around the world in order to establish the requirements and find possible solutions for PMR network interoperability. Without exception, all end-users have confirmed the need for open solutions.

The development of ODINI has received the attention of major European partners, which has resulted in joining a European funded program referred to as Heterogeneous Networks for Public Safety (HNPS). This program allows Rohill to develop ODINI as a real open standard with the help from universities, industrial partners and end-users.

The objective of ODINI is to create an ecosystem of products and services in a multi-vendor environment. The truly open architecture of ODINI is emphasized by publishing the draft ODINI standard as an open specification, and making the ODINI gateway software available as open source.

Challenges

During the meetings with end-users and system integrators it became clear that there are very diverse requirements for interoperability. The first challenge is to allow interoperability between different PMR networks during events and incidents. Even multi-agency networks do not always provide interoperability. For example, security personnel or private fire brigades working on a private PMR

network cannot communicate with public safety officers working on a nationwide network, even when both user groups use TETRA-based radio networks.

Although the public safety networks should be kept under strict control of control room personnel, it would be helpful to allow the control room operators (dispatchers) to communicate directly with user groups in the private networks, or to 'patch' communication between user groups in both networks during the incident.

The second requirement comes from the need to integrate different networks of the same end-user. Often there is no or limited interoperability between the PMR network, the data network (LAN, WAN) and the telephony network. This means that information available in the police station cannot be retrieved by the police officer on the street or in the car. This may be solved by installing an overlay mobile data network, but a higher level integration based on middleware could also solve this dilemma in a network-independent fashion, whereby coverage does not have to be guaranteed for all networks on all locations.

As mentioned before, vendor lock-in is another challenge experienced by end users. Proprietary architectures do not allow system interoperability of base stations and dispatcher workstations from other vendors. Although this particular problem is almost impossible to address, it is certainly possible to interconnect networks based on available system Application Programming Interfaces (APIs) in order to expand the coverage of existing networks.

Another practical problem faced by end-users is the inflexibility of existing infrastructure solutions to perform software upgrades step-by-step, to adapt a region specific configuration, or to find solutions for redundancy in order to achieve high availability. The top-tier TETRA infrastructure suppliers have promised to solve a number of these dilemmas using the TETRA Inter System Interface (ISI). Although this interface is now completed as a TETRA Interoperability Profile (TIP) and initial tests have been successful, there are quite some limitations found in the ISI. These include the high cost, the fact that it relies on almost obsolete technologies (E1, ISDN Primary Rate), and that it supports roaming, individual voice calls and SDS transfer only. Group calls, which more than 80% of the users within the public safety user groups rely on, are not supported!

Scenarios for interoperability of PMR networks

Three different scenarios are identified for system interconnection. Not all scenarios may be applicable to all end-users. Whether or not the mentioned scenarios are useful strongly depends on the end-user organization and existing networks in place. Generally speaking, the earlier the end-user is in the process of planning and deploying TETRA networks, the more scenarios may be applicable. Additional scenarios may be applicable for interconnecting networks; the listed scenarios should be regarded as examples of real-life scenarios experienced by end-users.

Scenario #1: tactical patch

The tactical patch scenario can be interesting for two applications. The first application is cross-border cooperation of public safety officers, which can also be two different regions in a large country. This scenario is shown on page 26 (Scenario 1: tactical patch, cross-border cooperation). One example of cross-border cooperation is a coordinated effort to raid a criminal organization operating in different countries. Instead of using GSM and fixed-line phones, it would be preferable to allow police officers in different countries to use TETRA terminals to communicate as one team. In a more hierarchically driven organization, the officer in charge may have the supervision and only stay in contact with a foreign police force, or the supervision may be performed from one control room only. In any case, the tactical patch is useful to allow transparent communications between two (or more) normally unrelated talk groups within two separate networks. Obviously, group calls are most important in this scenario. Individual calls may be applicable as well, but should be regarded as special calls while it is required to know the terminal number in the foreign network. This number can overlap with existing numbers, thus requiring a kind of prefix in order to dial directly.

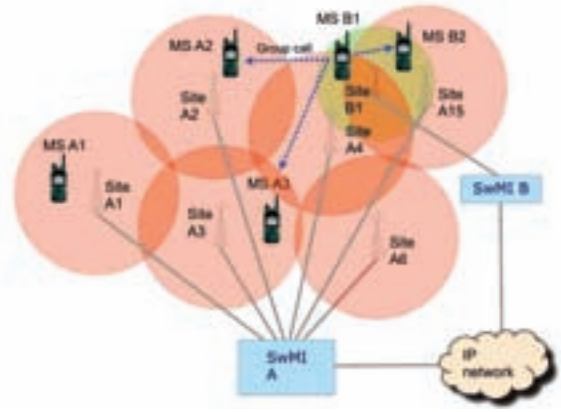
One example of cross-border cooperation is a coordinated effort to raid a criminal organisation operating in different countries. Instead of using GSM and fixed-line phones, it would be preferable to allow police officers in different countries to use TETRA terminals to communicate as one team.

The second tactical patch scenario is to interconnect overlapping networks from different organizations. This scenario is shown below.

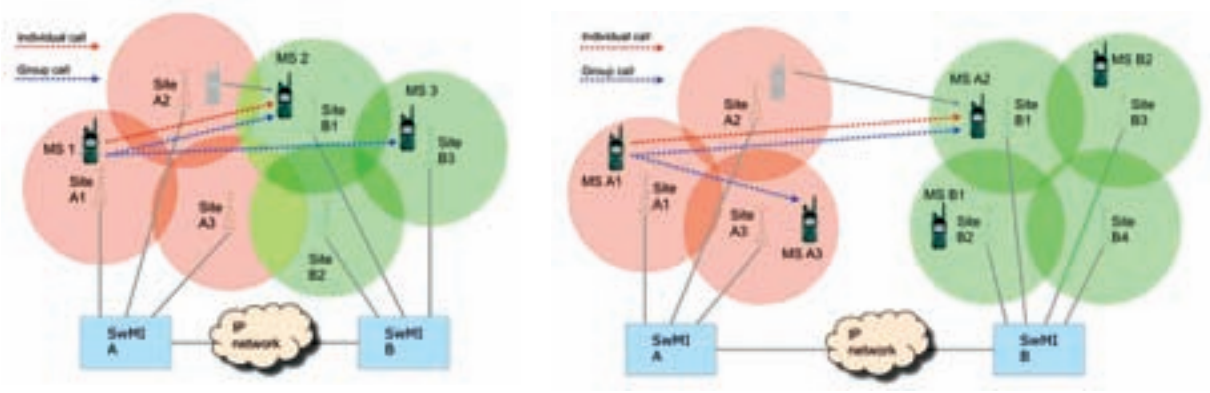
Inter-agency cooperation is applicable to users working in different radio networks, which need to communicate with each other during an incident or event. Authorization for cooperation is typically granted by the officer in charge within the control room of the regional or nationwide network. Some examples of inter-agency cooperation are:

- Cooperation of private fire brigades with their public counterparts during a large-scale incident or disaster. Private fire brigades are typically deployed by airports, tunnel operators and large industrial plants.
- Communication of security personnel with public safety officers in the control room during incidents. Applicable to sports stadiums, airports, shopping malls.
- Communication of armed forces to police officers. Military personnel operating on a private system within a military base or compound can interoperate with public safety officers during events or incidents.
- Communication between fire brigades, (nationwide or regionally operating) police and medical services during a large-scale incident or disaster. This scenario is applicable only if these agencies operate their own networks.
- Connection of a rapid deployment system to the regional or countrywide network to scale up capacity during a large-scale incident or disaster. In this scenario both networks are supervised by the same user group.

Group calls are basically the only means of communication in these scenarios. Also in these cases, the



Scenario 1: tactical patch, interagency cooperation of users on different radio networks.



Left to right: scenario 2, expanding coverage of an existing radio network. Scenario 3, migration to other network.

tactical patch connects two (or more) normally unrelated talk groups within two separate networks.

Scenario #2: expand coverage

Expanding coverage of an existing radio network by deploying additional networks requires multiple radio networks to act as one single radio network. This is a challenging scenario, as all current radio networks are based on proprietary architectures, and thus cannot be integrated easily. This scenario is illustrated above (left).

The need for this scenario is obvious, as it provides choice for the end-user when there is a need to expand coverage or capacity. The end-user does not rely on the original supplier only, thus avoiding vendor lock-in and improving competition. For TETRA network interoperability, the terminals should be able to work in both networks without reprogramming. This means that the Mobile Country Code (MCC) and Mobile Network Code (MNC) shall be equal for both networks, and also the same subscriber database is shared in both networks.

In practice, this is possible only if the networks are operated by the same agency. Apart from the need for subscriber database synchronization, also support of a rich set of functionalities is expected. This includes group calls, individual calls, text and status messaging, roaming, handover, packet data gateways, encryption, authentication, and supplementary services such as calling line identification, talking party identification, pre-emptive priority and so on.

Scenario #3: migration to other network

The third scenario is about operation of radios in foreign radio networks. This is illustrated above (right) – migration to other network

This scenario is very similar to how roaming of a mobile phone to a foreign cellular network works. When moving the radio outside of the coverage area of its home network, it starts searching for other radio networks. When the foreign network indicates that migration is supported, the radio terminal will attempt to register on the foreign network as a visitor.

Using an authentication-based handshake mechanism, authorized radio terminals will be granted access as visitors to the foreign network. In TETRA this scenario is referred to as migration instead of roaming.

The objective of this scenario is identical to the TETRA Inter System Interface (ISI). But because the ISI is currently limited to support of individual calls and SDS and status messaging only, the aim of ODINI is to support all functionalities which are important to end-users of mission-critical radio networks.

A real-life example of this scenario is cross-border operation of public safety officers. When an offender is crossing the border during a car chase, the police can continue communicating while driving into the foreign country. Obviously, the jurisdiction should allow this type of scenario, but with the focus on international collaboration to combat crime, there is certainly a trend to allow cross-border operations.

The solution: integration based on IP

ODINI aims at supporting the listed practical scenarios by means of an open solution. Although some interoperability solutions already exist, they are often too limited in their functional scope, are based on proprietary solutions, or are based on (almost) obsolete technologies. ODINI is ambitious in respect of supporting different scenarios and providing a wide range of functionalities.

However, the focus is on simplicity by eliminating unnecessary mechanisms, which are often found in telecomms standards. In addition, ODINI is based on existing, proven IP networking standards, which eliminates the need to define and validate the lower layer protocols.

Current state of IP technology The Internet Protocol (IP) has evolved into a set of standards, which now also addresses the requirements for mission-critical networks. An excellent example is Multi-Protocol Label Switching (MPLS), which allows deployment of a true nosingle- point-of-failure network when redundant paths exist in the backbone network.

Switchover to redundant paths is almost instant by using traffic engineered tunnels. Another trend is using the User Datagram Protocol (UDP). This protocol allows real-time transport of speech and time-critical data packets. When used with the proper user protocols, very fast and robust communication channels can be built.

IP Multicast is yet another emerging method to distribute group-oriented speech and call-related events. IP Multicast saves bandwidth and allows massive scalability of networking systems and devices. On Local Area Network (LAN) level, the Differentiated Services (DiffServ) QoS architecture is applied, which is using the Differentiated

Services Code Point (DSCP) implementation in IP routers, IP switches and computer operating systems to allow selection of Quality of Service (QoS), which can be translated into different requirements for forwarding IP packets in a heterogeneous IP network.

Together with MPLS, implementation of DSCP enables the deployment of multi-services IP backbones, which provide reliable transport of any type of IP traffic through a single network, ranging from office networking, VoIP telephony, CCTV up to telepresence with high-definition video.

ODINI uses these open standard based products and solutions to provide mission-critical availability, robust and fast operation, scalability and efficient use of network resources. Cisco and Alcatel-Lucent are two prime examples of manufacturers with a rich portfolio of ODINI-enabling equipment. ODINI can thus reap the benefits of these technologies without diverting to proprietary solutions.

Alcatel-Lucent MPLS-enabled router

The ODINI protocol ODINI is a user-level protocol, defining the interaction between nodes based on peer-to-peer relationships. In contrast to client-server protocols, ODINI does not define a hierarchy in operation. Although this may sound unpredictable in terms of control, this concept provides less dependency on network resources, improving resilience when system or link failures occur.

The core of the ODINI protocol is both simple and elegant. Push-to-Talk (PTT) operation is supported by a smart algorithm offering the best possible user response, even when high delays are present in networking links. In addition, robust operation is guaranteed, even when intermittent link failures occur. This makes the protocol suitable even to run over the public Internet through VPN connections, or through satellite links. The call-oriented messages are derived from existing telecommunication standards. This means that these are based on proven, well-validated protocols, running over a modern IP-based backbone instead of using synchronous communication links offered by SS7 or ISDN-PRI.

The Extended Markup Language (XML) is used to encapsulate the ODINI messages. XML provides a well-defined, extensible and open method to transport messages over IP networks. The flexibility of XML allows the ODINI protocol to be expanded and refined without losing backward compatibility.

The future of ODINI

The ODINI protocol is very flexible and powerful in terms of applications. Currently, ODINI fully supports the tactical patch scenarios for group calls. On short term, support of individual calls and the scenarios for expanding coverage and migration to other networks will be supported by protocol extensions. Note that implementation of ODINI is not limited to one air interface protocol only: also networks with different air interfaces (TETRA, TetraPol, APCO-25, DMR) can be interconnected by means of ODINI.

Interoperability between networks and devices based on ODINI

In the longer term, ODINI will also provide interoperability between devices operating on IP-enabled mobile networks. Today, these networks are not robust enough for mission-

How to participate in ODINI

The development of the ODINI standard and related products is supported by a community of equipment manufacturers, system integrators, universities and endusers.

The main sponsor of the ODINI initiative is Rohill Technologies B.V. The University of Twente is also a significant contributor for the design and validation of ODINI protocols as a partner within the European HNPS project.

The website www.odini.org is made available for public access of specifications, supporting documents and source code. A community forum is planned for interaction between manufacturers, system integrators, universities and end-users.

The open standards philosophy is respected by compliance to the open standards definition of the Open Source Initiative (OSI), whereby no NDA is required in order to obtain access to the standard. The ODINI open source project aims at making ODINI middleware available on the Microsoft Windows and Linux operating systems.

Development of the ODINI protocol stack closely follows the definition of the standard, in order to continuously implement and validate new functionalities.

Participation in ODINI development is appreciated. Whether it is to help with the definition of additional scenarios, to enhance the protocol, to contribute source code or by reporting defects: any kind of participation is welcome!

critical applications. But with the implementation of finegrained Quality-of-Service, for example within the WiMAX and LTE standards, it is expected that TETRA functionality can be made available on terminals without sacrificing call setup delay and robust operation.

In principle, ODINI is already capable of this, but further definition of typical TETRA services over IP through ODINI is necessary to provide identical services in order to emulate the rich functionality of TETRA.

The ODINI ecosystem

ODINI can be regarded as a middle-layer protocol, supporting different scenarios with one common requirement: mission-critical communications. As explained before, this market is currently dominated by companies promoting proprietary solutions. To avoid another proprietary solution to the listed scenarios, Rohill has decided to take a dramatically different approach: the ODINI protocol will be published with no restrictions on disclosure, and open-source software will be made available to interested parties in order to stimulate deployment of ODINI.

The rationale behind this approach is simple: Rohill believes that this is the most effective method to open the markets which are currently tightly controlled by a few large suppliers, as well as to create an environment in which best-of-class products and services can be combined and re-used in multiple projects.

The ODINI ecosystem is based on Commercial Off The Shelf (COTS) products in combination with software-based solutions from third-party suppliers. It is obvious that the Rohill TetraNode product is ODINI compliant, but it is not expected that Rohill can or will supply solutions to interconnect other brands of radio networks. This is enabled by ODINI partners, who have the expertise and access to the market to develop and supply these products.

System gateways are necessary to make a third-party infrastructure compatible with the ODINI protocol. By means of the system gateway, it is therefore possible to support one or more scenarios for network interconnection. Supporting multiple scenarios often requires access to multiple interfaces in the third-party radio network. For example, speech calls are supported through existing dispatcher interfaces, while migration requires a (simplified) TETRA ISI, and extending coverage requires subscriber provisioning and call diversion capabilities.

(The exact requirements for interfacing to ODINI gateways are outside the scope of this whitepaper.)

System gateways are necessary to make a third-party infrastructure compatible with the ODINI protocol.

Based on the open ODINI specifications, any supplier can develop a new or customize an existing dispatcher solution for operation within an ODINI network.

The simplicity of ODINI allows fast implementation without the worry to understand and support multiple supplier-specific interfaces. Rohill can offer readily available solutions based on the LDS 'Chameleon' and LDS 'Gecko', which can operate in ODINI mode instead of interfacing with the native TetraNode TIG protocol.

Voice and data logging is enabled by capturing voice and data within the IP network through the ODINI protocol. The logging server can attach to an ODINI group in order to receive speech, data and call-related events. If individual calls within the radio networks are also transferred out of the infrastructure, it is possible to also record these voice and data calls.

Rohill supports this with their TetraNode Voice-data Logging Server and Client solutions, which provide efficient storage of speech, SDS, status and location reports.

The distributed database server is an optional component within the ODINI ecosystem to provide reference database records in order to support roaming and individual calls between radio users operating within different networks. Although the routing information is cached in the system gateways as well, the distributed database server is essential to quickly get a system up and running again after equipment or link failures occur.

The telephony gateway supports a number of scenarios for tight integration of radio networks with VoIP telephony. Using the telephony gateway, users within the fixed and mobile telephone domain can access dispatchers as well as subscribers within the radio networks, and even talk groups within one or more radio networks.

Possible applications also include Public Safety Answering Point (PSAP) networks (112, 911).

TETRA client

A TETRA client application is part of the ODINI roadmap in order to provide powerful TETRA functionalities on devices connected through mobile IP networks. As stated before, the current mobile IP networks are not really capable of providing mission-critical services, but it is expected that this will improve in the coming years. Interoperability of ODINI through mobile IP networks opens up interesting use cases, such as:

- Group-oriented communication, including support of selected and scanning groups. The ODINI protocol ensures robust and low-delay operation of PTT and speech transfer;
- Priority and pre-emptive emergency calling, including the ability to override existing voice calls;
- Transparent End-to-End Encryption between TETRA terminals and mobile phones operating on commercial networks.

Conclusions

The goal of the ODINI initiative is to open up proprietary solutions of mission critical radio networks.

End-users can benefit on short term from a wide choice of applications within the ODINI ecosystem and enjoy increased competition and wider choice of interoperable radio networks.

ODINI is access network air interface independent. This enables integration with existing PMR networks. Also end-to-end mobile IP services are supported, which makes TETRA more future proof by offering TETRA functionality through mobile IP networks.

ODINI benefits from recent developments of IP networking standards. Solutions are now available to build true no-single-point-of-failure IP backbones which can carry any type of IP traffic, including ODINI speech/data.

Finally, the decision to embrace open protocols and open source is the key to wide participation of the industry, system integrators, academics and end-users, increasing the chance that ODINI will become a true open standard without reliance on one single company.

VoIP – causing headaches

The concept of a single emergency telephone number which would allow people to access emergency services was based on the traditional fixed-line phone networks. As a system it has worked very well but in recent years has struggled to keep up with the increasing penetration of mobile telephony, writes Carol Debell.

The share of emergency calls emanating from mobile networks is growing fast and experience shows that in an emergency situation mobile callers are not usually able to indicate their precise location which can present problems to emergency responders.

Even more of an issue is the growing use of VoIP services. Users of VoIP services do not necessarily distinguish between an IP-based service and the traditional fixed-line service. They expect to use their VoIP system to make calls to the emergency services. It is a trend that has thrown the importance of caller location information into sharp focus.

The Electronic Communications Committee (ECC) within the European Conference of Postal and Telecommunications Administrations (CEPT) recently published a draft report on this issue for consultation. ECC Report 143 on practical improvements in handling 112 emergency calls: Caller location information identifies the most relevant regulatory principles applicable to caller location requirements in the context of emergency calls and analyses the location information standards produced by ETSI for fixed, mobile and IP communications networks.

When it comes to VoIP, the report notes that efforts have been made by regulators and standards bodies to tackle the issue of how location information can be transmitted from VoIP services when an emergency call is made. It says that this issue is becoming increasingly relevant, particularly as there is an expectation that VoIP services will continue to develop and there will eventually be a complete switchover to IP-based networks.

The report identifies four different types of VoIP services which vary according to how the telephone service is offered technically:

- Type 1: non PATS (Publicly Available Telephone Service) peer-to-peer services which make and receive calls over the internet only and which can only communicate with the PSAP if it has internet-type VoIP interface and users have retrieved the PSAP's (public safety answering point) IP ID.
- Type 2: The VoIP service can make voice calls to the standard telephone network but cannot receive them. At present roughly half of European countries do not require the service provider of a Type 2 service to ensure that 112 or E112 calls can be made
- Type 3: VoIP service can receive calls from the public network but cannot make them
- Type 4: Calls can be made over the public network via the internet and can be received. Customers can be allocated an ordinary geographic number or a VoIP specific number. The Type 4 service does support 112 and E112 calls. Across Europe there is some discrepancy and how this type of service is regulated depending on whether the service has been declared as PATS or not.

A number of scenarios are discussed in relation to the retrieval of location data. In some cases the procedures are relatively straightforward. So, for instance, in Voice over Broadband (VoB) from a fixed terminal, the identification of the subscriber is done in the same way as the ordinary POTS (Plain Old Telephone System) subscribers where the telephone number is used as identifier.

However, when the call is VoB from a mobile or nomadic terminal, while the identification of the subscriber is done in a similar way as for ordinary POTS subscribers, providing location data requires a pro-active approach. For instance, the mobile network – in this case the VoIP server – can provide a location based on the base station. The terminal sends the location information when it places an emergency call. The received telephone number can be used but this does depend on how updated the latest location information relating to that telephone number is. Because of this it is recommended that procedures for verifying this data, and for updates, should be established.

The report points out where the call is from a nomadic or mobile terminal, and the subscriber is roaming and not using their service provider home network, and indeed it identifies nomadism as the main issue to be resolved. Since address information is the key element for an effective emergency response, the ERG (European Regulators Group*) recommends that all providers guarantee the availability of information that would alert the PSAP when a subscriber's address is not trustable, as would be the case with mobile and nomadic services.

In most European countries the location information relating to calls directed to 112 and originating from fixed line end users is found by the emergency response centre by looking up the telephone number in a database. That database contains, at the very least, the telephone number and address of all subscribers and is the database that in some countries provides the information used by directory enquiry services. To cover nomadic use, as a first step the report says providers could inform the emergency centre when a terminal can be used nomadically which would indicate that the address data might not be reliable. A second step, which has been widely discussed, would be for the operator to enable the user to update his current location, via the web. This could then be interrogated by the emergency centre if a112call is received.

Another approach under consideration in some countries would be to make it mandatory for VoIP providers to be able to recognize if a user is not located at the address corresponding to the NTP (network termination point) as a condition to obtaining the right to use geographic numbers.

***ERG 07-56 ev2 – ERG Common Position on VOIP and ERG 09-19 –ERG Action Plan to achieve VoIP conformity with ERG Position.**

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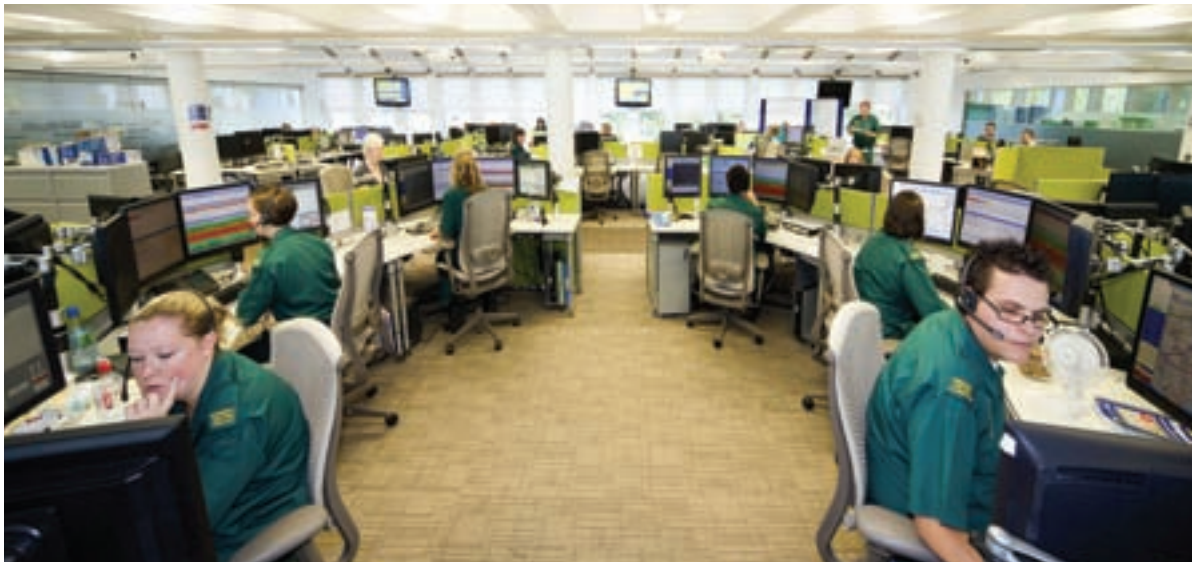
For more information on the consulation visit http://www.ero.dk/consultation



Saving time, saving lives

The Ambulance Service entered a new era when in summer 2006 the number of ambulance trusts in England was reduced from 29 to 12. We examine how one Trust has been using technology to help it meet the challenge.

Hampshire EOC went live in November 2008 and takes almost 50% of SCAS calls.

South Central Ambulance Service's (SCAS') go-live launch of its Berkshire Emergency Operations Centre (EOC) control room in September 2009 was the second of three, and a milestone moment in its regional rollout of a single, integrated, virtual control room strategy enabled by IT partner Intergraph's I/CAD system.

When the third EOC goes live this year SCAS' state-of-the-art computer-aided dispatch (CAD) environment will allow the three control rooms in Otterbourne (Hampshire), Wokingham (Berkshire) and Bicester (Oxfordshire and Buckinghamshire) to dispatch the best and nearest shared resources for every incident across its four-million population – regardless of location.

Within and across EOCs one and two, this is already happening. Hampshire, where almost 50% of SCAS calls are concentrated, went live in November 2008 and for emergency call taking the two centres now function, virtually as one. "The Berkshire dispatchers had their live training in Hampshire and were volunteering for overtime shifts so that they could come and use the CAD during the pre-go-live period, which was really positive. They just wanted to get their hands on it," says Luci Stephens, SCAS' Assistant Director, EOC.

"Going forward, my vision for the EOCs are three centres working as one, so that from a patient's perspective it should not matter where you dial 999 from – no matter your location you should be able to get through to your ambulance service as quickly as possible" Luci Stephens says. "Thanks to our new regional CAD and telephony systems, that is now possible."

Stephens also has a vision for a central dispatching future in which vehicle location will not hinder service: "No matter where the patient dials 999 from, a resource will be dispatched to them by our EOC team using I/CAD".

SCAS has upgraded its mobile data units, allowing job details data and map-based information to be transferred from the CAD to ambulances on the move.

Other technology advances include I/CAD's new LV (locate and verify), flexible free-text search application, which Intergraph say is considerably more powerful than its predecessor. "It simplifies and speeds up getting addresses and related information for key locations" comments SCAS Head of Planning (Operations) Rob Ellery. "It is a very quick and accurate search tool: and as each site works off the same database the system can pinpoint the right local location information for any call, anywhere. So LV also aids the dispatch process".

Rob Ellery also cites the Regional SSM (systems status plan management) tool as another operations advance that has been enabled by smart technology. Developed by SCAS for the new regional ambulance environment with Intergraph, Regional SSM allows SCAS to be more efficient in the way it deploys ambulances and positions vehicles strategically in the field, notably for standby dispatch compliance. SCAS dispatchers can now plot vehicles to optimise their position for fastest response from dynamic standby points, recommending vehicle movements to points that are not covered.

The I/CAD system also speeds call taking and dispatch by automatically logging a call before it is answered by control room staff – pinpointing its location as onscreen co-ordinates on the system's digital map, in readiness for call processing and dispatch.

The new environment has already had a measurable

impact on operations, with EOC control room processing time cut by up to 15 seconds. It has also contributed to an improvement in SCAS' overall 999, A8 LTI (immediately life threatening incidents) response times, in conjunction with other operational initiatives being implemented to improve services to patients. And the new CAD system has also been central to a major SCAS internal change programme ("I/CAD is my CAD") including the incentivised retraining of some 200 emergency control staff. "Within weeks the CAD improved our service to patients, other health professionals and our own operational staff. Our users like the system, which is important as this project is about both people and technology," says Rob Ellery, whose team has introduced training-completion and overtime incentives to motivate staff during the three-EOC rollout programme. "I/CAD provides us with a virtual EOC across the entire region" Ellery concludes. "It enables better, faster service with business resilience – if one system failed it would automatically switch to an alternative EOC. So far, we have not only been able to maintain our services to patients with the new system – we have measurably improved it, shortening "A8" response times and saving lives."

A "new" Ambulance Service for England

The ambulance service entered a new era when in July 2006 the number of ambulance trusts in England was reduced from 29 to 12. According to Government sources, with fewer larger ambulance trusts there will be less bureaucracy, more money to invest in front line services and better care for patients. The declared benefits of creating larger trusts also include more investment in front-line services through savings in 'back-room' functions; better emergency planning, given the greater capacity and capability to respond to major incidents of all kinds; and more integrated services.

South Central Ambulance Service – background

South Central Ambulance Service NHS Trust (SCAS) was established in July 2006 following the merger of four ambulance trusts in the counties of Berkshire, Buckinghamshire, Hampshire and Oxfordshire. This region covers approximately 3,554 sq miles with a resident population of over four million. SCAS emergency call centres handle more than 400,000 emergency and urgent calls a year, with annual demand increasing by some 5%.

SCAS is embarking on a programme of change in the way pre-hospital care is delivered, working to treat more patients in their homes in order to better meet their needs and prevent unnecessary trips to hospital. Where hospital treatment is required modern ambulance crews have additional clinical training and can carry out more lifesaving procedures on scene and en route to hospital.

To achieve this change, SCAS has said that it will be training more paramedics and emergency care practitioners and engaging with other healthcare partners such as GPs, district nurses, social and community services, "to ensure the most appropriate options for care are available to the patient".

Working with its staff, patients, partners and wider communities SCAS is (in the words of the Trust) "continually developing new and innovative ways of improving patient outcomes and delivering a good value quality service".

SCAS' control room technology – overview

South Central Ambulance Service's (SCAS') 'single-system, virtual control room' computer-aided dispatch (CAD) technology integrates intelligent, real-time mapping with the processes of call handling and dispatching, records and information management, remote access and mobile data, in an integrated environment that also provides automatic backup for continuity of service. If one ambulance control room is out of action for any reason, one or both of the other control rooms will automatically take over emergency call taking and dispatch.

SCAS previously used a variety of legacy CAD systems of various capabilities and ages. With control rooms working on separate systems it was often difficult to dispatch the nearest ambulance if it was located across a trust boundary. SCAS said: "The new [CAD] system will improve the sharing of resources across the regional service and speed up processes, which will enable us to improve our services to patients, other health professionals and also operational staff."

Another advantage of replacing three different and separate systems with one is that information reporting is easier. Previously the Trust's information specialists had to extract data from the three different systems before processing it for consistency to enable like-for-like comparison and reporting. The new system provides operational and decision-support information in real time as well as a single source of information to aid long-term planning.

Berkshire EOC – the new system provides operational and decision-support in real time.

Time for TEA2 in Glasgow

Glasgow Subway used to have a VHF analogue PMR system operating via a leaky feeder for many years, but the system was obsolete and did not provide interoperability with blue light services, which is why SPT applied successfully to be added to the Airwave sharers list and for the implementation of an Airwave service based solution for the subway.

The Strathclyde Partnership for Transport (SPT) Glasgow Subway carries over 14 million passengers annually. The subway is approximately 10km in length and comprises two separate tunnels linking 15 stations.

A TEA2 sublicence was granted by the Cabinet Office and a contract was subsequently placed with Airwave Solutions in June 2008 for the provision of a communication services including:

- Provision of Airwave service across all operational areas
- Zetron DCS-5020 Digital Control systems to provide integration of radio and telephony via a user friendly GUI for the Controller, Assistant Controller and CCTV operator in the Control Room at Govan
- Cab radio installations based on Sepura SRM3500 with special interfaces to allow a controller to broadcast directly over the train PA system driver intervention
- Sepura SRH3800 handportables.

SPT management identified that this project would be safety assessed under the Railway and Other Guided Transport Regulations 2006 (ROGS). Under ROGS a key requirement for the project was the need for an independent verifier to confirm that the project had managed safety issues appropriately and any residual risks were not greater than with the previous communications system. For this activity Lloyds Register was appointed.

Airwave subcontracted the infrastructure works to Axell Wireless and Bailey Rail for the communication backbone, and Arqiva for the train radio and communication control console systems. Hyder Consulting provided Project Management, CDM the coordination, technical assurance and assistance on fleetmapping for SPT.

At the heart of the installation is a dedicated two-channel Airwave base station at Govan which distributes the signals via multi-core fibre to distribution racks in each of the 15 subway stations. On-Frequency repeaters are distributed at alternate stations, each repeater feeding radiating cable in the inner and outer circles in both directions.

Low profile dome and panel antennas connected by $^{1}/_{2}$" co-axial cable to the station distribution racks provide coverage on station platforms and other public areas. Standby mains power is available to serve the equipment at all stations and battery back-up supply is available too. Local Site Trunking (LST) is enabled on the Airwave base station allowing the SPT deployment to continue functioning in isolation to the rest of the Airwave network.

In order to avoid disruption to passenger services the installation of the fibre and radiating feeder was undertaken during the night. The work started in September 2008 and in nightly five-hour sessions the tunnel cable brackets were installed, at weekends the stringing of the cables was undertaken as longer access time was possible. The tunnel cabling was complete early February 2009.

It was recognised from the outset of the project that in order to deliver communications that met the users' specific and unique requirements it was necessary to clearly define and document those needs. Ten distinct operational groups were identified amongst SPT staff. These included train drivers, station staff, operational and control staff, security and maintenance teams.

Representatives met around the table to identify who needed to communicate with whom, both within SPT and with external agencies. This enabled seven distinct SPT talkgroups to be identified from which a total of 10 operational profiles were defined for programming into the cab radio, handportable and fixed mobile radio terminals.

Certain profiles provide access telephony and access to interoperability talkgroups, to enable communication with police and other blue-light agencies. Whilst for many operational staff their communication is talkgroup based this is not the case for the train drivers who for safety reasons communicate point to point with their control. Only in exceptional circumstances will they operate on talkgroups.

In an implementation of this size it was not financially viable to deliver Airwave via CCI ports to an ICCS. Because of this the number of talkgroups that could be monitored on the Zetron Controllers is determined by the number of fixed mobiles to which they are connected; in this case four are present.

If a driver wishes to speak with a controller they will send a "request to speak" (RTS) or "urgent request to speak" (URTS) status code using a short cut key on the cab radio. This status code is delivered to a predefined ISSI this being the particular fixed mobile that is monitoring the trains talkgroup. The controller will respond using an individual call using a different fixed mobile to the one that is monitoring the trains talkgroup.

The main operational talkgroups for train drivers and station staff are permanently monitored in the control room. The talkgroup used for maintenance teams may not be monitored; in order to ensure that an emergency call is

heard by control a shortcut key was programmed into the handportables to change to the stations talkgroup so that the call would be heard in the control room.

For the coverage of the stations and depot, comprehensive subjective testing was undertaken in all expected coverage areas using calibrated receivers to measure the received signal strength indication (RSSI), and also using a standard TETRA handportable unit for test calls from specified areas. The results showed that coverage and service requirements were met. Switchover to the backup optical fibre cable was also satisfactorily tested.

In order to validate coverage and service in the tunnels objective testing was undertaken using a specialist testing company. These tests entailed the collection, analysis and reporting of test data of the RSSI and Voice Quality (VQ) being delivered by the Airwave Network. This testing was undertaken on a Saturday night, early Sunday morning when the subway was closed. Three slow speed runs at (15mph) were undertaken in the outer and inner tunnels each to collect the data. RSSI samples were collected every second and the VQ samples at four per minute. The objective testing report showed that the Airwave train radio coverage and voice quality was well within requirements.

The Airwave service went live throughout the Glasgow subway in the summer of 2009. Crucial to the successful deployment was all stakeholders working together with a can-do mentality to deliver within a short time frame with no disruption to passenger services. The involvement of users at an early stage was vital to ensure that the technology met user expectations working within a safety critical environment.

The 60-second interview: Riana Smit, LFB

London Fire Brigade has been using predictive analytics from SAS UK for the last two years to help prioritise the allocation of fire prevention resources. The software predicts the households most at risk of fire – no small task when dealing with 3.2 million households. *BAPCO Journal* interviewed Riana Smit, Risk Information Officer, LFB, about the practicalities of the predictive option.

The information provided by the SAS Incident Risk Analysis Toolkit is used by firefighters for preventative work including home fire safety checks, giving advice and fitting smoke alarms in a staggering 65,000 households, per year.

Having reliable analytical data to help predict risk helps LFB to reduce the number of household fires, helping the organisation to deploy staff in the areas where they can make the biggest impact, educating those at the highest risk.

Riana Smit explained that the software was adopted for a number of reasons. Historically fire risk had been partly calculated on actual fire death reports, but with these types of fire becoming uncommon the resulting picture was inadequate and could be misleading. The LFB wanted to create a model where it could input what it thought were the actual main drivers for risk. "We needed something for regression modelling where we could set the criteria ourselves, and we needed something that could deal with larger data sets."

The options available to LFB three years ago were both limiting and limited: "One was a free download, but we did not have the skills in-house to build upon the modelling aspect. The other option we had was incapable of either dealing with the size of the data set or carrying out the kind of modelling we wanted to do. After comparing SAS with the other options I decided it was the better option."

The Incident Risk Analysis Toolkit, for one, does not require advanced training, explained Smit: "It is easier to find the personnel with those skills – or acquire those skills – rather than find someone with hard

programming experience, as would be required for the other options. The SAS toolkit is easier to use and it gives us the functionality we need for the models we want to create, whilst providing the scope we require to move on in the future. So it filled the niche and we know that someone could take over the role if needed."

Today, around 60 data sets are fed into the model including census data, population demographics, geographic data, deprivation data, historic incidents and past prevention activity. "We also use some of our own in-house data sets, such as prevention work that has been done in certain areas, and the risk-assessments of buildings. So it is quite a varied set," said Smit.

The model aims primarily to provide information on where accidental dwelling fires are most likely to occur. "We envisaged three years ago that we would be updating our model on a quarterly basis, keeping in line with when our new incident counts come out. But we've found that the variables do not change that much, so there was not much benefit in updating it when we couldn't perceive any risk changes." As a result, the risk model is updated every six months, with the aim to publish the results on a yearly basis.

The results are published in a format that replicates the 33 local authority boroughs and 649 wards in London, in order to facilitate prevention work with local authorities.

LFB has had enquiries from fire brigades that are interested in embracing this type of predictive software, and Smit believes many could benefit from it.

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