



Hope for the best, train for the worst

Richard Martin looks at how PMR radios are used in real life, the problems that can occur, and how these are mitigated through effective planning and training

Major incidents place enormous stress on officers and systems. There will always be actions that go well and those that could have been done better – analysis of the event is likely to identify processes that could be improved, and this is true of the way in which officers use their radios.

One incident that highlights this is the Manchester Arena bombing which killed 22 people on 22 May 2017. The former fire chief of the Greater Manchester Fire and Rescue Service recently reported that poor communications hindered their response. The fire service was unable to communicate with the police inspector at the scene because of a lack of a radio link and a busy phonenumber. The fire crews had to keep 500m away as all they could do was follow national guidance. They were only allowed to help nearly two hours after the explosion.

Other hard recent lessons

A year before on the morning of 22 March 2016, bombs exploded at Brussels Airport in Zaventem, Belgium and at Maalbeek metro station in the city centre. Thirty-two civilians and three perpetrators were killed, and more than 300 people

Effective response relies on excellent communication between different agencies

were injured. Another bomb was found during a search of the airport. The ASTRID TETRA network had to handle twice the normal number of calls during the day, and three times the number of talk groups.

This level of traffic placed unplanned demands on the base stations in a confined area. Of the 24 base stations in Brussels, five faced congestion together with two others outside the city. One of the issues that emerged was the use of the PTT button. Some users were not able to establish a call because they released the PTT too early and lost their place in the queue and had to wait even longer. This generates a great deal of signalling traffic. At the same time there were many one-to-one calls on the TETRA network as the public mobile system was overloaded, further adding to the load on the ASTRID network. Scanning also created a great deal of traffic, and needs to be used sparingly in future.

“Scanning loaded the network with signalling traffic,” says Frederik Langhendries from the Belgian TETRA operator. “Users from reinforcements from all over the country wanted to listen to local groups from their home region groups that had nothing to do with managing the crisis in Brussels.” Langhendries also cites the Turkish Airlines crash near ▶

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Schiphol Airport in The Netherlands in 2009: at one time there were dozens of ambulances waiting on a nearby road, all listening for orders or information. This saturated the TETRA system; the solution is to have crisis talk groups in order to leave capacity available for dedicated team groups. Another lesson is the importance of having liaison officers in the command centre at the location – somebody in charge of regulating operational communication flows and able to fix priorities if necessary.

Langhendries recommends ensuring that users know how to switch fluently to crisis mode, and how to use the PTT and emergency buttons in particular. “Calls should be kept short, and the groups clearly named and understood, and they need to be kept to a minimum; simple is better. Direct mode reduces signalling and network traffic and needs to be encouraged in certain situations.”

Langhendries adds: “The switch from normal to crisis operations needs to be as seamless as possible to save time and increase efficiency. Regular simulations and disaster drills focused on communications recreate something of the stress and urgency encountered at these times.”

Together with public safety organisations, ASTRID has developed several initiatives that make it easier for end-users to follow the rules, including a short video animation available in French and Dutch. The fact sheet that accompanies this highlights the following rules:

- Make sure that the batteries are fully charged
- Keep your communication short
- Press and hold the ‘push-to-talk’ button until you get the connection
- Avoid individual calls
- Avoid scanning
- Use only the relevant communication groups in your situation
- Network saturated? No radio coverage? Use the ‘direct mode’ feature
- Only use the Emergency button in case of extreme need.

ASTRID has also worked with Beaconsim (TETRAsim), a long-established developer of training packages in Finland, to develop an e-learning platform available for 60,000 licences and intended for all end-users in Belgium. Online courses can be used whenever the user has time, and the user’s progress can be tracked. These training courses are also customised to meet the needs of different user groups.

Planning for operation and training

Stephane Martinetti, Airbus’s training centres manager, says his company typically trains its customers’ trainers to enable the roll-out of skills through large organisations. For a large group of users this can take several months to cascade through. Critical to the process is what happens before training starts. The Airbus team will work with managers and officers to establish a series of case studies that describe the main activities of the end-user. From these the talk groups

and structures can be identified. Talk groups are a major strength of PMR systems as they allow many people to hear how a situation is unfolding, but they require training to be used effectively – they should be understood as tools, and used almost instinctively.

From this, all of the main tasks and situations will have a talk group nominated. The talk groups that the commanders and dispatchers will use will also need to be identified and included in their training; some of these will be inter-agency. Martinetti concludes: “This deep understanding of the roles and characteristics of the different groups of users is fundamental to effective network operation and training.”

“Great radio discipline for radio users starts with training [at] the commander level, such as field and incident commands,” says Henri Paalasmaa, a product manager at Beaconsim. “This training has the biggest impact on the overall success of the operations. These persons will be responsible for assessing the situation, co-ordinating the units on-site and for multi-agency communication.”

He adds that the best way to learn these skills includes the use of scenario-based training, which helps users to learn the standard operating procedures and communication models in a low-stress, easily repeatable situation. A full debriefing should be done after the training, which should evaluate all the decisions and actions that were made during the exercise. Paalasmaa also says that this task is made easier using tools such as Beaconsim TEAM, “a virtual classroom with full communication and debriefing abilities”.

Both of Beaconsim’s training simulator systems, ONE and TEAM, are customised for clients, so that the simulator radio is a 1:1 copy of the real device, as well as the communication plan, procedures and other organisation-specific material. Simulator training has many benefits, which directly translate to more efficient, real-life radio usage. The student can learn at their own pace using a low-stress training environment with instant feedback. This, combined with the possibility to rehearse when needed, will lead to quick improvements in communication skills. After training, the students’ competence can be objectively assessed.

Also in Finland, Kari Junttila and Juha-Pekka Iso-Iiomaki are instructors at the Pelastusopisto emergency services training centre in Kuopio. They focus on the need to develop skills to the point where they become almost instinctive,

It makes sense to pay particular attention to training commanders as their radio skills will have more of an impact on the handling of an incident than those of their colleagues





particularly in high-stress situations. “We need to build a form of muscle memory into users so that the radios are used properly without thinking, allowing the users to focus on their duties rather than their communications,” says Junttila. “Using the PTT correctly is one of the fundamental aspects to training, and with students coming onto the courses who have been using smartphones for some time, this becomes vital.”

“This instinctive use of the radio is particularly important when the user is in a dangerous or life-critical operation,” he adds. “This is why we have made the talk group structure as simple as possible for our users, senior officers and controllers. Users typically only use just a few talk groups, while commanders use more, which include inter-agency or international groups. In some cases, commanders may use two radios. If there is a major incident then operational groups are used to keep active users connected. In such situations, commanders may be listening to several groups.”

Knowledge of the different groups and when and how to use them is built into the training. “We do our best to create real-life situations, to add a degree of urgency into the sessions. Users get to know the types of emergencies they will face, and train on the talk groups they will use in actual operations. Experience of previous real-life emergencies has been built in, together with the best practices developed as a result.”

Users in Western Canada

The Royal Canadian Mounted Police (RCMP) operate across Canada, collaborating with local police forces and other agencies. Discussing the radio systems that the RCMP use in and around Vancouver, staff sergeant Jason Jaschinsky says: “A P25 system is leased in urban Vancouver and Victoria. In the remainder of the province they continue to use the VHF system, which is well-suited to these areas.”

Training packages are given for both types, covering:

- an introduction to radio propagation
- how dispatch works
- channels and talk groups
- re-keying for encryption
- locking and unlocking the radio
- batteries and how to get the best from them.

The RCMP use many talk groups, but the top 16 are programmed onto the rotary knob on the radio. The

Building muscle memory through repeated use allows personnel to operate their radios correctly during stressful situations

remainder are programmed into the menus. Groups are programmed into the menus, clustered by Metro Vancouver, Lower Mainland and wider areas, and a simplex channel is used for province-wide communications.

Interoperation with other forces and agencies is enabled in Vancouver and the other areas where the P25 system is used. “Generally the RCMP groups are not shared,” Jaschinsky says, “but officers can request access to join the fire or medical groups when necessary.” During the forest fires in 2017 in central British Columbia, the local forces were supplemented with officers from Vancouver and other areas. Understanding which channels to use was an issue.

“Thinking forward, the force wants to reduce the amount of training required, while still embedding essential disciplines,” Jaschinsky adds. “One way of achieving this is to give talk groups meaningful names. Today’s tech-savvy generation has high expectations of how communications should work and what services should be available – the radios need to evolve to meet these expectations.”

Captain Jonathan Gormick, the lead for training and public information officer at the Vancouver Fire and Rescue Services, explains the initial training programme. “Those who attend a pre-employment training programme at an accredited school do receive basic radio-use training. This is augmented once they’re hired. Upon entering the Officer Development Program about 16 years later, upcoming officers receive further training and practice, mostly around officer-specific roles such as managing a MAYDAY.”

On the recent upgrade to digital radios, Gormick says: “A force-wide retraining programme took place in March for the fire officers as new digital P25 radios were being rolled out. During the two weeks before the switchover, the training team ran an interactive Q&A session, officers were able to voice any uncertainties and get explanations, which could be shared across the force.”

During the first few weeks after the transition there were few errors. The talk group naming and channel knob positions had to be changed, and users had to know and select the most commonly used groups. Gormick adds: “Where possible, the talk groups were given descriptive names, for example the names of bridges where officers are close to another division.”

Direct mode is not commonly used by the fire officers. Communicating through the network ensures that officers do not become isolated from commanders and dispatchers – this was a difference with the earlier analogue system that needed to be part of the training.

Looking forward

While the essence of radio discipline consists of principles that have remained essentially unchanged for decades, the same cannot be said for the new generation of smartphone-using recruits going through today’s training programmes.

The rise of mission-critical LTE as a complement to (or potential replacement for) PMR means planners and managers have to balance user expectations and capabilities. The core needs are still there, but there is hope that radios can be made more intuitive and intelligent so training can be reduced and officers quickly connected with the appropriate teams in high-stress situations. There is work to be done by planners, managers and providers alike. 🌀