Talking across Frontiers[1]

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Abstract :

Increased cross-border interaction between the police units at the frontiers of the sovereign nations within the European Union is an inevitable consequence of the relaxation of border controls. A multi-layered framework for European police cooperation, uniting the familiar centralised communication channels with dynamic activity at frontier zones, is required to accommodate it. How else can the multitude of cross-border police interactions which long ago became a matter of sheer necessity in several frontier regions be conducted in a safe and orderly manner? How can personal observations required in the fight against terrorism be conveyed? How too can we envisage other forms of public service cooperation such as that between neighbouring emergency services in joint responses to disasters? Assuming that we possess the ingenuity to create such a framework this paper concentrates upon a conditional issue: the practicality of performing direct cross-border interaction. Different languages, incompatible technologies, varied working practices, contrasting administrations and authority structures represent serious impediments to reliable and meaningful operational liaison between all the public services. Three multinational projects in the English Channel region are reported here which have tackled these impediments at first hand: the PoliceSpeak and Intacom Projects and LinguaNet. The first two contributed to binational police and emergency service cooperation at the Channel Tunnel. LinguaNet explored further impediments and also created purpose-specific, cross-border messaging software and a multinational user group allowing thirty police forces from nine countries to experiment for today's demands, and to record experiences and hard data for the design of the cross border communication systems of the future.

The boundaries in the English Channel region are no longer 'fortress' frontiers. There are few physical impediments to movement through them; there are few border checks. They are crossed by millions of people each year without hindrance. Cross border commercial traffic is intense. At the Channel Tunnel, a single transport system enclosing 17,000 people and traversing an international frontier, is administered, protected and policed by co-operating agencies from two nations. Paradoxically, the present frontiers of the Channel region are now active sites for co-operation between nations rather than obstructions. As a consequence, and notwithstanding the seeming incompatibility of the French (centralised) and UK (decentralised) police and emergency service administrations, new types of interaction at the periphery have been and are being arranged (see Gallagher 1998, 2000). They represent vital adjustments to changed circumstances and allow new threats to be met jointly and speedily. Many of the interactions are operational. They require specially engineered communications provisions and it is the problems encountered in providing these which form the main subject of this essay.

Three completed projects in public service, cross border, communication for the region in question are described here. The first two are the PoliceSpeak and Intacom projects (1989 to 1994), conducted during the building and commissioning of the Channel Tunnel. The third is the LinguaNet project (1994 to 1998)[1] which began within Anglo/French binational initiatives

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for the Tunnel but went on to provide a multilingual computer mediated cross border police communication system now used by frontier law enforcement units in nine European countries. A fourth project called 'Suremind'[2] is presently under construction. This new project builds upon the earlier Channel Tunnel work but takes the investigation further into cross border communications for a broader range of multinational, multi-agency responses to major incidents, including maritime, air traffic and terrestrial misadventures. There is reason to believe that the lessons learned from this group of projects are applicable to many frontier regions in Europe and beyond.

The LinguaNet police communication system is significant for four reasons. Firstly, the number of frontier locations using LinguaNet has increased greatly from the original pair of just two police offices in Kent and the Nord Pas-de-Calais. Secondly, the LinguaNet initiative became broader in scope than the Channel Tunnel projects and was eventually supported by the European Commission as a six nation Framework 4 Telematics project with a budget in excess of 2.5 million ECU. Thirdly, LinguaNet is a provision which recognises the importance of first hand observations and the sharing of those observations between trusted law enforcement professionals. Terrorism and organised crime cannot be defeated by techniques such as data mining and analysis of electronic footprints alone. Fourthly, LinguaNet, as a project, has metamorphosed from a custom-built police communications mechanism to a living experiment in cross border co-operation which is running still. Much is being learned from the experiment which, when properly recorded and analysed, can provide vital data for future developments.

Cross border law enforcement remains however a controversial issue. The success of several cross border policing initiatives such as those outlined by Gallagher (2000) in the English Channel region, the imaginative creation of a contiguous Polish/German border facility near the river Oder and the established three nation working alliance around Maastricht have yet to demonstrate much influence on overall thinking. There seems to be a reluctance amongst planners to conceive of a pan European administrative law enforcement structure any more sophisticated than a conventional pyramid. Whilst there is no denying the value of the global view possible from the upper layers of a pyramid there are dangers of over concentration upon and a concomitant focus of investment on such untested centralising structures. There is a risk that such a focus could impede efforts to exploit and build upon lateral solutions using the regional and centralised structures and alliances which exist already; direct cross border police communication between trusted units operating at the frontiers of individual nations may be discouraged or suppressed. In the meantime, criminal activity including terrorism, which exploits the present inadequacies in cross border communication will, of course, continue. In terms of cross border cooperation we may find, in consequence, more rapid progress in conspicuously humanitarian, less politically charged endeavours such as joint responses to disasters than in the fight against crime.

This article is not concerned however with the legal instruments of co-operation. The stress here is upon the challenges of communicating across borders. Co-operation is not just a

matter of the will and the permission to co-operate. Without the means to communicate confidently and reliably, it cannot take place. In the following essay a short introduction is given to the manner in which linguistics and other disciplines have been combined in three operational communication studies. Each project is then summarised in terms of the initial requirement, the issues addressed, the manner of its performance and the results produced. The article concludes with a short discussion of what has been achieved and what tangible progress can be expected over the next decade in developing communications tools for cross border co-operation.

Language Engineering and Operational Communications

The projects discussed here drew heavily upon academic research in the fields of linguistics, communications and computer science. They were not however motivated by academic enquiry alone. The main impetus for both the Channel Tunnel communications projects and LinguaNet was operational necessity. Their character was pragmatic and practical throughout; the intended readership and "usership" was the practitioner and the operations planner. The published results reflect this. The reports and recommendations, lexicons, procedures, messaging standards and communications software produced were directed at the routine, the ordinary and often seemingly inconspicuous affairs of day to day operational communication between the services involved. In doing so they have provided recommendations for and actual components of several successful European cross border co-operations.

Alongside the practical measures there has also been an academic contribution, especially to linguistics. This is not surprising. The most important linguistic field invoked, that of controlled or engineered languages, has always had a practical orientation evident from a history which goes back to the earliest experimenters (Johnson 1989, 1990). The 17th century philosophers and scientists Bacon, Descartes, Dalgano and Wilkins were greatly concerned with building a stable linguistic medium for scientific thought and the transmission of knowledge free from the vagaries of natural language. The artificial languages movement belongs to the same stable. Figures such as John Wilkins (1614-1672), Condorcet (1743-1794), and later, in the 19th century Schleyer (Volapük 1880) and Zamenhof (Esperanto 1887), attempted to develop languages free of ambiguity which could be used universally. In relatively recent years, other schemes such as Jesperson's Novial (1928), Ogden's Basic English (1932) Hogben's Interglossa (1943) and Ashby and Clark's Glosa (1981) completed a period of language engineering scholarship covering some 400 years.

In the last few decades, the struggle to design reliable language systems has continued within specialist fields including operational communication where mutual understanding is deemed "mission critical". Here, purpose built language, communications technology and operational procedures are integrated. Air traffic control (Civil Aviation Authority 1978) is a good example, maritime VHF radio communication (Weeks et al. 1984a, b and 1988) is another.

The attempt within the PoliceSpeak and Intacom projects to provide linguistic stability at the Channel Tunnel represents a third.

Operational success in undertakings like maritime, air traffic, police, fire and rescue operations depends significantly upon accurate observation and data and reliable communication of these to others. Reliable communication hinges upon the existence of the means to communicate, the quality of the carrier technology, the competence of operators, the design of the procedures laid out for them and the clarity of the messages they transmit. Over the years, countless operational errors have resulted from inappropriate communications provision, inadequate procedures and poorly worded messages. Many lives have been sacrificed in the process. It is doubtful that The Light Brigade would have charged at Balaclava in 1854 had Raglan's command which prompted it been worded differently (Woodham-Smith 2000). The Tenerife air crash of 1977 may not have occurred had the air traffic control messages been clear (Hawkins 1987). The lives of an entire diving crew may not have been lost in the North Sea in 1983 (Godden 1983) had not the message *You can talk about overtime when you've made the clamp'* been mistakenly interpreted as an instruction to open a pressure lock.

Natural language, which is multi-purpose and inexact, is not a good medium for operational communication as the following examples, drawn from various sources, illustrate:

- functional ambiguity: Are you asking me or telling me? Is the message a question or a command?
- terminological imprecision: is the *holding bay* the same place as the *mustering point?*
- linguistic variety: e.g. many different ways of asking someone to repeat what they have just said: *say again, please repeat, what was that?, again please, pardon?*
- polysemy: multiple meanings for single expressions: *casualty, officer, light, handle, charge, let him have it.*
- confusion between different classes of alphanumeric data: speeds, heights, registration numbers, often ambiguous prepositions like 'at' or 'on' are the only clue.
- random abbreviation, elision and ellipsis: in an effort to be brief, using non-standard contractions and creating acronyms. In one police text transmission *'off'* was used for both 'officer' and 'offender'.
- undisciplined procedures leading to turn-taking confusion in radio exchanges, failure to read back critical information.
- lack of sensitivity to the medium: operators behaving, for example, as if radios and telephones transmitted the full modular range of the human voice and can therefore relay intonation reliably enough to distinguish a command from a question.

In response to difficulties like these, specialist operational languages have evolved or been designed which are restricted sub-sets of language. These are deployed, for example in air traffic control, wherever a language circuit is a requirement in the co-ordination and control mechanisms of a technical operation. They contain measures for avoiding natural language

difficulties, for example**:**

- employing standard phrases for certain commonly occurring utterances
- explicit marking of the communicative function of utterances
- marking units in advance to avoid the weakness of prepositions
- creating standard units or data elements to restrict variety
- creating standard discourse procedures
- creating sentence level controlled grammars

A single example drawn from the language of sea communication (Weeks et al. 1984a) illustrates a few of these measures. An utterance which in natural language might be any variant of *'I'd like you to take the pilot from the SB buoy at 2 o'clock.'* must be (in Seaspeak) *'Advice: take the pilot, position: SB buoy, time: one-four-zero-zero UTC.'*

In some cases it is possible to circumvent linguistic difficulties by the provision of procedures or technologies which either obviate the need for language or at least reduce dependency on it. For example, the installation of VHF direction finding equipment at ports or the fitting of radar transponders in aircraft cuts down the amount of identificational and positional information which would otherwise need to be transmitted by language (Johnson 1989, 1990). The same holds true for the police email system LinguaNet (Prolingua Ltd. 1999) and European Commission (1997) where the possibility to integrate pictures, diagrams and sound files into messages reduces language dependency. Such measures neatly circumvent many language barriers too and are therefore important assets in cross border communication**.**

The Channel Tunnel: PoliceSpeak and Intacom Projects

PoliceSpeak

A decade ago, when the British Police in the County of Kent and the authorities in the Nord Pas-de-Calais were drawing up plans for emergency co-ordination and routine policing duties in the Channel Tunnel, it was clear to all concerned that the installation would be full of impediments to good communication. Not the least of these was the presence of two languages, English and French. All the examples of linguistic confusion given in the previous section are monolingual; in a bilingual or multilingual context the potential for confusion is greatly multiplied. In concert therefore with the process of drawing up a plan for full-scale combined responses to any major incident in the Tunnel by a bi-national safety committee (Kent County Emergency Planning Unit 1994) several programmes of English and French language training were begun in France and England. Worries remained, however, especially with regard to the language problem since the language courses proved costly, the progress was slow, and no specific-purpose language learning materials were available. The police examined the available technological solutions and at one stage investigated automatic

translation. Such software was then, and still is, unsuitable for mission-critical environments. It will never translate everyday natural language, sometimes called "free text" with sufficient accuracy for life or death situations (Gorm Hansen, I. et al 1998).

Another initiative was the PoliceSpeak project, funded by British Telecom, the Home Office (Police Requirements Support Unit, PRSU) and the Kent County Council which was launched in 1988 (Johnson et al 1993a,b,c). Its brief was to: research the existing operational languages and conventions used by the police on both sides of the frontier, research the gradually developing operational environment of the Tunnel itself, attempt to predict the communications demands, and propose a set of standards and communications protocols for mutually comprehensible police communication at the Channel Tunnel and its frontiers.

An important element of this study was to come up with the basic building blocks of transfrontier communication for both speech and text messages, something akin to a restricted language. What was needed was a system sharing some of the characteristics of international air traffic and port operations, which did not have several ways of transmitting the time of day ('1 o'clock', '13 hundred hours', 'one three zero zero'), and a multitude of ways of instructing an officer to go somewhere ('attend', 'go', 'take a run up to', 'toddle along to'). A system was required which did not contain reliance on intonation for the expression of communicative function, which avoided slang and arbitrary abbreviation, but which operated according to easily learned yet disciplined procedures which incorporated a short standard phraseology for the management of radio exchanges. It was felt that such a system would make police communications more concise, more predictable, more stable and less ambiguous. It would provide, at the Channel Tunnel, the basis for targeted English language training for French police and a basis for making agreements on linguistic parity with the French language used in the same operational setting.

The work was performed by a joint team of academics and police services personnel. The academic members had previously conducted projects in sea and port communications (Weeks et al 1984) air traffic control (Robertson and Johnson 1988), and controlled language machine translation (Johnson E., Matthews D., Garner M. and British Telecom 1985-91) at Wolfson College, University of Cambridge. The services members comprised police officers from the Kent Constabulary and their counterparts from France: the *Gendarmerie Nationale* and several divisions of the *Police Nationale*, notably the *Police de l'Air et des Frontièrs*. The *Brigade Nationale* of the Belgian *Police Judiciare* also assisted. An active consultative committee comprising representatives from British Transport Police, Joint Metropolitan Police/ACPO European Unit, ACPO Policy Unit, Interpol, Kent Fire Brigade, Kent Ambulance Service, Eurotunnel, HM Customs and Excise, H.M. Immigration Service and the Kent County Emergency Planning Office, guided the work and contributed significantly to it. The RCMP in Canada, which has a long history of bilingual policing, also contributed advice and language resources.

Projects in operational communications are not just words and phrases, they are completely context dependent. A wide variety of source material is needed to establish the working environment which the communications must serve. PoliceSpeak was no exception. It involved close examination of the Channel Tunnel as an operational environment as set out in the engineering drawings and other planning documents. It required a review of the anticipated technical communications provisions, and a study of the contrasting British and French police organisations and the legal and administrative framework being put in place to enable both sides to work together. The public safety aspects of cross frontier working required access to all the British and French major incident plans and attendance by team members at major incident exercises and planning meetings. On the linguistic side it was necessary to assemble all pre-existing documents in English and French which contained guidelines for police communications procedure.

A unique resource was the collection of a 'corpus' of real operational language. It was essential to know how language was used in order to find examples of existing good practice and build on them and to find examples where improvements could be made. Useful information can often be obtained by reading data or listening to recordings but much more can be gained if the data are analysed by computer. A large body of textual data for PoliceSpeak was obtained directly from police computer systems. This was supplemented by transcribed voice recordings taken from hundreds of hours of UHF and VHF operational radio exchanges and telephone messages. Many of the items in this corpus were annotated to add information about the meanings of words and their functions in the messages; for example, every description of a person was marked so that all occurrences could be extracted and compared. The English and French corpora were subjected to many forms of computational analysis and according to a number of parameters. Amongst the techniques used were concordances, word counts, together with special programs built by the Cambridge team to identify parts of speech, verb phrases, noun phrases, data elements, multiple word clusters and word associations. It was also possible to track multiple conversations about the same event.

The analysis revealed much which had hitherto been hidden: the (real) lexicon, modes of usage, indications of linguistic variety, use of slang, evidence of breakdowns in understanding, delays, and so on (Johnson 1993, 1996b). By way of illustration some examples drawn from the PoliceSpeak analysis are given below:

A typical entry from the corpus, a radio exchange:

> /A Seven one to control.
> /B Go ahead John.
> /A Yeah re er that damage, one in custody.
> /B Yeah all received I'll let custody know.
> /A Actually there now, Fred.
> /B Received.

We can note some difficulties immediately. The distinction between caller and called is by way of the single syllable 'to' which is homophonous with 'two'. 'Go ahead' is ambiguous - does it mean 'speak', 'do what you're doing', 'drive forward'? 'Seven one' has become 'John'. 'All received' indicates no more than 'I heard something which makes sense to me'. 'Control' becomes 'Fred'.

Further examples from the corpus of police language:

- 'Can you ten seven your last'
  'I've already ten sevened it twice'

- 'One six a sierra sierra bravo golf one six two'

- 'Ford Escort estate colour red, no trace registered keeper (person) (address)'

- 'He was seen doing a bottling job in a nightclub'

- 'It is requested that a statement be obtained from XX and the driver at the time also if any other witnesses who may have been passengers at the time who may have additional evidence, be interviewed and statements obtained.'

In these further examples it will be noted (first example) that natural language has repossessed the code phrase 'ten seven' - which should stand for 'please repeat your last message' - by turning it into a verb. In the second example there is conflict between the 'NATO' alphabet - alpha, bravo, charlie, etc., and the brand names of motor cars - Sierra, Golf, Alpha Romeo, Bravo. The third example demonstrates the influence of computer screen layouts on radio and telephone speech practice. The fourth is an example of confusing idiom ('a bottling job' is not innocent kitchen employment, but an attack with a broken bottle). The fifth example demonstrates the linguistic contortions necessary to employ the passive voice which gets considerably more complex to French ears when combined with the British fondness for expressing emphasis by way of understatement: The message ..'a difference of opinion appears to be taking place between Mr. Jennings and his wife' actually referred to a serious physical assault.

PoliceSpeak was ready by 1992 and the work was presented to the then Chief Constable of Kent, Sir Paul Condon, at a ceremony at Wolfson College Cambridge in May of that year. The results comprised a restricted sub-set of English language for both speech and text police communications together with communications procedures; a corpus derived English/French police lexicon comprising some 5,500 entries and a report covering police communications provision for the Channel Tunnel. The report also set out the main differences between British and French police organisations and their working practices.

The PoliceSpeak speech recommendations were also applied to normal county-wide radio practice. To test this, a programme of evaluation in the context of routine policing duties at two police stations in Kent was initiated. The results were encouraging. There was even a cost saving in terms of air time used: an 18% drop in words, a 17% drop in radio conversations and a 29% drop in transmissions made. A year later the communications procedures were adapted for issue to all police officers in Kent as a guide to radio usage throughout the force (Kent County Constabulary 1994). This set of procedures was later in 1994 approved by the Home Office Radio Procedures working group and recommended for national adoption.

Intacom

Six months after the delivery of the PoliceSpeak results, a successor project with the wider brief of addressing the communications challenges of inter-agency communications was launched. The INTACOM project (INTer Agency COMmunications [Johnson et al 1995a,b,c; Kent County Constabulary 1995]) worked on the much more varied languages, workpractices, conventions and plans of the entire range of British and French emergency services working at the Tunnel. As with PoliceSpeak the research was undertaken by a combined team of British and French emergency service professionals and an academic team at Cambridge. In this project however the role of the fire, ambulance and (in France) the medical response organisations was more prominent. Sapeurs-Pompiers from the fire stations in Boulogne and Le Touquet were involved, as were personnel of the CODIS Control Room in Arras. Service d'Aide Médicale Urgente (SAMU), the medical response team in Arras, and the Lille Préfecture were among the many co-operating organisations and offices. The aim and objectives of the Intacom Project were drawn up at a meeting between the Kent County Constabulary and the Fire and Ambulance Services on 30 October 1991. This was: 'To develop joint emergency services language and communications procedures to meet the requirements of combined operations within the Channel Tunnel and the County of Kent to ensure public safety.'

The necessity for such a project at such a frontier location is evident from a single example: the set of descriptors used when referring to the three levels of command in the British and French systems of incident management. The main command post in the UK at which strategy is decided, sometimes called GOLD command, is known in the UK as 'strategic', in France as 'fixé'. The intermediate level at one remove from the front line, sometimes referred to as SILVER, is known in the UK as 'tactical', in France as 'opérationnel'. The group working at the scene, sometimes referred to as BRONZE, is known in the UK as 'operational', in France as 'avancé'.

One point of potential confusion is clearly the use of the terms *opérationnel* and *operational*. This confusion can spread to personnel as well as locations depending on which language is being spoken and which frame of reference is being used:

<div style="text-align: center;">

the operational commander <> *le commandant opérationnel*

operational control position <> *position de commandement opérationnel*

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It was thought initially that Intacom would be able to establish strict standards for operational communication between the several British and French agencies involved. However, the results of analyses of corpora containing speech and text from all of them, a close study of the available procedure manuals and emergency plans (see for example: ACPO 1987, Chief and Assistant Chief Fire Officers' Association 1991, Kent County Constabulary 1990 and Ministry of the Interior, French Republic *Plan ORSEC* 1982), and numerous visits to the agencies themselves quickly established that this would not be feasible. Even in a single language it was evident that across the spectrum of agencies the operational procedures and language differed too much to be reconciled in the short term. The following table which contrasts samples of operational messages from a number of UK agencies illustrates the point:

		A:	B:
	AGENCY	TEXT MESSAGES	RADIO MESSAGES
1	Kent Fire Brigade	REQ ATT OF POL VEHICLE BELIEVED TO BE STOLEN - KEYHOLDER NOW IA	TL's just getting into position. Out of projection for the Bronto though.
2	Kent Ambulance Service	CAS ON R/GATE LIFEBOAT 7 ST, 13 WK	Yeah, we've Mr [NAME] from [ADDRESS] into the Maidstone casualty double handed with a CVA over.
3	Kent County Constabulary	TEF - CAN BB VEH ATT MAC RE LIASE WITH INTER AND INJ	KA to Tango Echo Tango Echo vehicle for a code one hundred Mike two box eight eight three five Bravo Tango Echo vehicle
4	HM Coastguard	VO ETA WILL BE 1155 LOCAL BACK AT CASUALTY	Will you please raise I-L-B on seven three er we suggest you break down to channel ten I say again channel one zero

Up to now no officer from any one of these (UK) agencies presented with the above table has been able to decipher all of the rest of the communications with confidence. Acronyms and jargon aside, even the word 'casualty' has two meanings. The coastguard refer to the ship in distress as 'casualty' whereas for the ambulance service the meaning here is a hospital department. In neither case is the intended meaning 'injured person'. At that point it was decided to concentrate on certain key issues which could be addressed successfully and to lay the ground for more unifying endeavours in the future. The key issues are reflected in the form of the results produced.

The first volume of results, the 'Report and Recommendations', considered inter-agency communication at the Tunnel, largely from the perspective of language and procedures. This volume brought to the attention of planners and practitioners not only items of detail discovered during a study of emergency plans and an analysis of a large corpus of real communications, but also some fundamentally flawed assumptions about the communication process itself. The report opens with the following paragraph which is subsequently related to incident reporting and patrol deployment at a typical police control room:

> Communication is often thought of as a straightforward process, which involves nothing more difficult than conveying messages from one person or place to another. It is said to involve a 'sender' and 'a receiver', who 'pass information' by means of 'messages'. The image suggests a parcel sent through the post: the sender 'puts meanings' into a message, and the parcel is 'sent' through the air or on a piece of paper to the receiver, who 'unpacks' the message to find the idea that originated in the sender's mind. In the popular view, the meaning of a message is defined by its 'information content'. Information is treated as if it were a physical substance, like the water in a plumbing system, which 'flows' from one point to another over the airwaves or the telephone wires. Information is not a substance; strictly speaking it can only exist once someone is informed and is thus inseparable from human involvement. Up to the point that the human becomes informed, any words, figures, pictures or sounds are simply 'data' or, as naval officers might say, 'signals'. Unfortunately the metaphorical use of the term 'information' is now so widespread that it would probably be confusing if we avoided it. Let us simply note, therefore, that the term often implies much more than we intend and note that the phrases:
>
> > '... but I sent you the information',
> > '... but you received the information',
>
> do not absolve a communicator from responsibility for a communications failure (Johnson et al 1995a: vii).

Drawing upon genuine linguistic evidence from both the English and French languages the report points out dangers at the most 'microscopic' category within the linguistic level, a consideration of 'operational words'. It then goes on to consider 'making operational sense',

how those words are used in operational messages. Later it deals with how those strings of words are used in the context of 'operational exchanges', i.e. conversations.

From this point on the report gets increasingly operational. A summary is given of the differences between the emergency response organisations of Britain and France and a critical review is conducted of the various agencies' major incident procedure plans and guidelines. A section is included which goes far beyond the linguistic by making recommendations for procedure and technology to overcome observed shortcomings in actual or planned communications during major incidents. The report closes by considering communications implications of the plan which had been drawn up by the Kent County Emergency Planning Unit to guide binational emergency service operation for the Channel Tunnel, 'the Binat plan', the Intacom team, having already contributed to the drafting of this document.

Intacom made recommendations which fall into two categories: recommendations of principle and recommendations for explicit action. In the first category are recommendations which arise from concerns about individual aspects of cross border communication which figure permanently in planning for and performance of inter-agency contact. Examples of such concerns are: the proliferation of unnecessary codes/abbreviations/acronyms; the dangers attendant upon the use of language and procedures appropriate to one medium of communication which are inappropriate for another; and the concerns about the manner in which communications guidance is expressed in the preparation of major incident manuals and other documents.

The second category, explicit action, includes recommendations for a Channel Tunnel Glossary with parity between English and French. The Intacom Project produced a corpus derived English-French and French-English lexicon (Johnson et al 1995c) amounting to over 5,000 words but this was descriptive, i.e., it contains a very wide range of terms in use across the agencies at that time. Such lexicons are useful reference documents but 'parity' lexicons containing agreed terms have far greater utility for all cross border and international public service communications especially where these communications are computer mediated.

Standardisation, or failing that 'harmonisation', is also recommended for aspects of inter-agency radio in order to provide safer inter-operability of procedures, standard phraseology, and common procedures for such things as making and maintaining contact, transmission of numbers and quantities, situation reports, verifying and clarifying information. Compatible standards can also be applied to other media of communication, e.g., telephone, paper forms and electronic messaging.

It was noted during the research that an excessive number of individual communications were taking place between control locations (both national or international) for the purpose of building and maintaining a common perspective of an incident and the progress of the response to it. The Intacom recommendations included therefore a proposal to avoid such wastage of effort and to circumvent misunderstanding. A system which would allow

bulletins to be automatically transmitted from one location to another was suggested. Such a system would carry announcements very similar to those which are currently portrayed on incident location whiteboards. It was felt that such a provision would reduce the load on communications between control locations in the UK and France by other media, improve communication between personnel working at a single control location, and achieve more effective common perception at all UK and French controls of the incident itself and the progress of the response to it.

The range of incident plans available to the different emergency agencies and reviewed by the Intacom research team was, in 1994, considerable. A recommendation was made to rationalise them and to make the relationships between the various texts more apparent. There is some evidence that efforts have been made in that regard with the publication of increasingly prescriptive versions of the Home Office publication 'Dealing with Disaster'(HMSO1992). With respect to the specific plan for the Channel Tunnel, Intacom recommended that fully interchangeable English and French versions of the Binational Plan be prepared which were in direct accord with each other, e.g., identical section numbers, identical glossaries, identical maps and diagrams bearing text in both languages.

Many of these recommendations have now been adopted and there is good evidence of successful cross-border co-operation. The Safety Authority still stands and the Emergency Planning Binational Committee meets twice a year with Eurotunnel. Once a year the Tunnel is opened for Binational exercises in addition to a regular programme of other multi-agency exercises. Kent Fire Brigade and their French counterparts train together weekly.

The most significant recommendation of the Intacom team and the most far reaching in its eventual implementation was the suggestion that electronic messaging be deployed in major incident co-ordination and that for the Channel Tunnel this could be engineered to operate certain functions bilingually. A prototype bilingual messaging system had already been built by the Intacom team which demonstrated that a major incident situation report could be drafted electronically, transmitted to another location, translated where necessary into another language and converted from text into speech for onward transmission by operational radio and telephone. This demonstrator became the prototype for a system called 'LinguaNet' which began its development as Intacom drew to a close.

LinguaNet

LinguaNet is communications software for fast, multilingual, communications between law enforcement agencies able and willing to co-operate across frontiers. Used in concert with national bureaux of Interpol, LinguaNet has become an additional tool to help police combat cross-border crime wherever differences in national administrations, language and communications technology hinder cross-border co-operation between active front-line police units.

A European police officer faced with investigating a credit card fraud, a vehicle theft, a missing or wanted person, or responding to a cross-border incident in progress must be equipped to make (some) direct contacts internationally. Such contacts will typically involve a foreign language and another force, administration or, in certain cases, a company with an unfamiliar structure and operating under different legal constraints. Although there are organisations such as Interpol which can aid the officer, they are not generally set up to handle queries 'in real time'. Rapid, secure and easy to use communications are however crucial to the conduct of many operations and most national laws impose time constraints on the conduct of enquiries, especially where persons are retained in custody. The lifting of internal border controls across Europe has increased the need to find solutions to the problem of cross-border police co-operation since cross-border and inter-regional police communication has a much larger rôle to play than it did before these frontiers were relaxed. There is evidence that criminals are increasingly exploiting weaknesses in police communications to commit crimes both within the European Union and across its external frontiers.

During the years LinguaNet has been in service, there have been countless examples of good cross-frontier collaborations. These include instances where routine cross border interactions have led to formal exchanges by Interpol and corresponding actions by national forces: the identification of stolen vehicles at one LinguaNet location (Felixstowe Port) has amounted to some £2.4 million being recovered in 3 years; a child abduction was thwarted through rapid Dutch and Kent police communication; an interception on the Spanish/French frontier was linked to a Manchester drugs gang through communication with the French Gendarmerie; enquiries between Munich police, Birmingham and Suffolk about an (apparently trivial) traffic violation in Birmingham revealed a direct connection to a 'cattle prod' robber in Berlin; and communications between the *Police Nationale* and several UK forces were effective against football hooligans at the World Cup at Lens.

The first version of LinguaNet was a UNIX system known as 'BTMS' and was used for bilingual cross-border police communications at Dover and Calais. It was later expanded to deal with cross Channel police communications between the United Kingdom, France, Belgium and The Netherlands. A growing network of connections has now been established in nine countries. The system was built with and for European police officers most of whom are working at frontier locations.

In 1995 the European Commission DGXIII Framework IV Programme supported the development of LinguaNet under a three year project. Half of the funds came from the Commission, the other half from the industrial partners and police in a six-nation consortium. The system was exhibited as a 'success story' at the European Telematics Exhibition in Barcelona in 1998. In 1999 the system also received the first prize for language technology from the UK Minister for Trade in a National competition organised by the Department of Trade and Industry.

The total number of LinguaNet installations stands now at fifty. These are in Belgium, France, the Netherlands, Spain, United Kingdom, Denmark, and Germany. Due to the history of the development many are at ports and airports. Two more are in countries bordering the EU to the East and are used solely for experimentation with traffic messages. There are also mobile (laptop/GSM) LinguaNet stations used experimentally for communications during special or short term operations. LinguaNet may be used to service a big network of contacts or used quite independently of a large group for 'closed circuit' connections between two (or just a few) users at, for example, frontiers, tunnels, airports, ferry links or other desirable points of contact. In such circumstances the system functions rather like a 'secure' telephone line.

It is important to emphasise that LinguaNet is not an automatic mechanism for sharing national database information. It is simply a purpose-built method of communication: an 'email' system to enable officers to communicate with one another across frontiers safely and with the minimum of misunderstanding. The system assists officers to compose messages containing formatted text (persons, vehicles, bank cards, firearms etc.), free text & high quality images from scanners, digital cameras or pre-existing files and to exchange these only between known and trusted locations. It is controlled by the police agencies themselves and is entirely independent of the Internet and of service providers. Using LinguaNet the agencies participating are able to keep an accurate record of an operational message; make communication directly, without server intervention or delays; insist upon confirmation of receipt; read or search previous messages in several languages; and monitor the progress of a transmission.

Police forces in different nations make changes to their information and communication systems at different speeds. They also make different choices. The result is incompatibility. LinguaNet maintains links between users in different forces and countries nonetheless. It is designed to operate independently and to survive change. One feature which achieves this is a software transport system to allow one Windows machine to communicate directly with another.   Use of the Windows operating system means that inexpensive off-the-shelf peripherals such as printers, scanners, digital cameras and recorders can be used in conjunction with the system. On the connectivity side the present users prefer point-to-point. LinguaNet will however work perfectly well with client server architecture. During the development phase LinguaNet was successfully tested by Philips and Simoco for transmission via TETRA, a digital radio standard developed by ETSI, the European Telecommunications Standards Institute.

Anything developed in this field must be adaptable to allow for improvements. The system has two, technically separate, but fully integrated parts: an application part for message preparation and a transport part for the transmission and reception of those messages. This is a flexible architecture which allows further developments to take place easily. For example, further messages, languages and facilities can be added easily to the application part without

disturbing the transport part. Equally, the transport part can be changed to another form of transport without disturbing the application.

LinguaNet and the Language Barrier

No one can hope to learn properly all the European languages. Machine translation will never be accurate enough for the exchange of life or death messages (Gorm Hansen,I.et al.1998). LinguaNet deals with the language problem by providing the best that can be done at present and gives a methodology for the future by incorporating several complementary features. The multi-lingual interfaces provide users at any site with a choice of languages with which to run the system. They may switch from one to another.

Automatic translation of formatted text, regarding vehicles, persons, credit cards, firearms, etc., allows users to read the fundamental components of incoming messages in their own language. This has been achieved by police officers from all the participating nations who have agreed standard translations of the critical police terms in them in advance. The ability to support text messages with alternative non-language media such as pictures and sounds increases further the system's interlingual capability.

Free text is also permitted within LinguaNet but for safety reasons the software does not attempt to translate automatically free text segments. These are conveyed in their original form. Such free text additions however usually relate to accompanying, already translated, formatted text (e.g. 'more about the person described'). This connection assists interpretation of the free text. Free text in a foreign language can be dealt with by human linguists perhaps with the assistance of on-line dictionaries. Additionally, LinguaNet works well alongside proprietary free text machine translation systems such as Systran (Gorm Hansen, I and Selsøe Sørensen, H. 1998). Police users have found commercial products like these useful for making rough translations of incoming (never outgoing) free text parts of LinguaNet messages.

The team which developed LinguaNet had already built police and emergency service lexicons for English and French. As funding opportunities arise, more are being created. Linguists at the Copenhagen Business School who participated in the European Commission stage of the LinguaNet development are especially active in this field and have produced valuable resources in many languages (Gorm Hansen et al 1998). It is expected that results from their work will support future enhancements of LinguaNet and other initiatives.

Being relatively simple in concept, LinguaNet allows more languages to be added with ease. The compilation of the Italian version of the system took only four weeks to complete. This is an indication of the speed with which other languages can be added when resources are available. As matters stand, any user anywhere has the choice (at any time) of all the current LinguaNet languages in which to operate simply by opting for a different regional setting.

The current languages are: Danish, Dutch, English, French, German, Italian, Portuguese and Spanish.

From the academic perspective, cross-frontier police applications, where more than one language is used, where users, irrespective of nationality, share a common purpose and where individuals are accustomed to working within a disciplined framework, are the perfect context for testing controlled language methodology. Central to this is the assumption that standard forms of linguistic expression and standard data elements can be agreed in advance for commonly occurring message types, message segments and fields. Where this is done for several languages simultaneously, automatic conversion between languages becomes possible. This is sufficient to achieve extremely high reliability levels, well beyond the attainment of all contemporary technologies aimed at free text language translation. Such an operational environment is also the ideal setting to test the communicative utility (in both monolingual and multilingual transactions) of the inclusion of other representational forms such as sounds and graphics.

LinguaNet is not just a technology. In terms of cross-border co-operation, the User Groups that have grown up around the system are far more important. Police from all participating nations meet on a regular basis to exchange views on technology and working practices and to help to map out the operational requirements of the future. The LinguaNet User Group has become, like other international police associations, an opportunity for establishing trusting relationships. The International User Group which presently has a Dutch chairman and a UK Secretariat has met twice a year over the past four years in different countries.

The use of LinguaNet represents a genuine effort on the part of many European police forces to work co-operatively at frontier locations to deal with the vast amount of routine matters which are an inevitable consequence of the free movement of persons and goods. It has produced good operational results and has brought officers from different states into direct and productive contact. Ingenious provisions have been made with national agencies to ensure no conflict with nationally based initiatives and harmony with the workings of Interpol. What has emerged is a model of co-operation in which the established police forces of sovereign states act together through both the well established contacts at national centres and through trusted contacts at the frontier. This model of policing is in stark contrast to that associated with a supra-national police force.

Suremind

The Suremind project will bring together emergency service agencies from at least four countries: France, the United Kingdom, Belgium and The Netherlands. It will investigate the operational communications of multi national major incident responses. In the immediate aftermath of a disaster, the most important messages are those which state what has happened and which prompt the response by the emergency services. These messages determine the timing and nature of the response. Garbled, ambiguous, disorganised or

incomprehensible situation reports, especially during the early stages, result, inevitably, in a chaotic response. Whenever major incidents have an international dimension, i.e., when the nationals of more than one country are involved or the response to the incident requires the mobilisation of agencies of more than one country, the potential for confusion increases.

Suremind will concentrate on two communication topics: the exchange of first and subsequent situation reports (including pollution alerts) between shore-based response agencies of more than one country, and the exchange of casualty details between casualty bureaux in more than one country. The transmission of casualty details from points of recovery or assembly will also be investigated. The operational context for the research is expected to be a maritime incident in the English Channel similar to that which occurred in August 1999 when the passenger ship *Norwegian Dream* collided with the container ship *Ever Decent*.

Members of the Suremind team from Hampshire Constabulary and Wolfson College, Cambridge, have recently participated in a broad ranging study of maritime disaster preparation (Briggs 2000). This project, part funded by the European Commission Community Action Programme in Civil Protection and the County Councils of Essex and Suffolk, examined the short term, medium term and long term issues of maritime disasters in European waters. Its final workshop drew delegates from 12 of the 15 member nations of the European Union. The recommendations of this project support the Suremind initiative as representing a vital element of the conduct of a multi-nation emergency response. In addition to the coastal emergency services, the Munich Airport Police Department has agreed to participate in Suremind since they have already undertaken work in the gathering and processing of casualty information in relation to major incidents. Their 'GAST-EPIC' facility was recently used in connection with the train crash in Hanover and again at the tunnel fire near Salzburg.

Pan-European coverage cannot be achieved in a single project. Instead it is likely that Suremind will be restricted to one sea area: the English Channel/la Manche. Work in progress is being reported to the wider community. It is conceivable that sister projects will be started in other sea areas such as the Irish Sea, the Baltic, the Skagerrak, the Mediterranean and the Aegean.

Conclusion

The focus of this article has been upon certain practical measures taken by police and emergency services at the Tunnel frontier to enable them to co-operate. In each case described, the intention was to complement the valuable work being done by international liaison officers, multinational groups like the Cross Channel Intelligence Conference and international organs such as Interpol. The Channel Tunnel provided a good environment for study because in this case the need to communicate was forced upon the organisations working at the nations' peripheries by the construction of a new transport system - a

transport system which would 'funnel' people and goods across a single frontier point on a scale never before seen. It was recognised early on that only by intimate cross border contact could this mechanism be policed and kept safe. A major fire in the Channel Tunnel bore this out. Burgeoning reports of large scale trafficking of people, terrorism, bootlegging, smuggling and the illegal importation of drugs may be indicators of a need for even closer operational ties. In all cases a willingness to work together and permission to do so must be complemented by practical measures to ensure good communication.

The LinguaNet project demonstrated that it is possible to build safe, computer mediated, communication systems capable of supporting multilingual cross border operational communication. The considerable number of crimes already resolved and the continued enthusiasm of the police units involved are evidence of its potential. There are, however, conflicting visions of cross-border police co-operation which reflect, no doubt, conventional centre-versus-periphery tensions. Gallagher (1998) refers to several writers such as House (1981), Gregory (1991), Anderson (1989), and Benyon et al (1990) who have explored this phenomenon in detail. Conflicting visions may impede more general adoption of systems like LinguaNet, whilst agreements such as that signed at Schengen on 14 June 1985 are bound to promote it. In the meantime, and thanks largely to a body of enthusiastic and, it has to be said, daring front-line police officers and far-sighted central bodies working within bilateral and multilateral agreements, experiments such as LinguaNet continue. Ample justification for efforts to perfect and in many cases specify in detail cross border communication can be found in the Schengen Accord itself. The version produced by Henning Spjelkavik (2000) for the World Wide Web contains on just the first two pages of Title 3, Police and Security, Chapter 1, Police Cooperation no less than 24 instances of prescription for actions which assume adequate communication and mutual comprehension. Dealing with the vexed issue of cross border surveillance for example the Accord employs terms such as: *"be authorised to; on request; in response to a request; the request must be sent; to grant or to forward the requested authorisation; must be notified; shall be submitted without delay; following notification……".* Use of these phrases, which sound perfectly reasonable in a monolingual, monocultural, homogeneous administrative setting takes for granted that their performance in cross border operations is uncomplicated. This essay suggests, on the contrary, that it is irresponsible to leave such rules as they stand without further guidance as to their performance and to wait for an accident then the first defence along the lines of *"... but I sent you the information"*" to trigger enquiry and action.

Less contentious is the work being planned for multinational responses to major incidents. Tragedies like the capsize of the *Herald of Free Enterprise* at Zeebrugge and the sinking of the *Estonia* required close quarters operational interaction between several nations. There may be more scope for rapid progress in cross border co-operation in these matters than in law enforcement. Even so, the similarity of the undertakings and the participation of agencies which have a rôle in both incident response and law enforcement suggest that research in multinational disaster response could, eventually, be applied to cross border police communication.

Without doubt, the opportunities for cross border co-operation in public services increase as the internal frontiers in Europe are relaxed. The Channel Tunnel projects and the LinguaNet experiment have demonstrated that the barriers of language, work practices and conventions can, with foresight, be overcome; technologies can be built to service cross border communication. Physical resources can be shared and national sensitivities respected.

Notes

1. Publications and reports arising from these projects are listed in the References. All are available from PoliceSpeak Publications, Cambridge Research Laboratories, 181a Huntingdon Road, Cambridge CB3 ODJ (tel: +44 1223 276815).

2. SUREMIND: Support for Responses to Major incidents and Disasters: International, Inter-Agency Communication.

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