

The London Ambulance fiasco

- The London Ambulance Service (LAS) Computer Aided Despatch (CAD) system
- Failed dramatically on October 26th 1992 shortly after it was introduced:
 - The system could not cope with the load placed on it by normal use
 - The response to emergency calls was several hours
 - Ambulance communications failed and ambulances were lost from the system
- Catalogue of errors made in the procurement, design, implementation, and introduction of the system

London Ambulance Service

- Managed by South West Thames Regional Health Authority
- Largest ambulance service in the world (LAS inquiry report)
 - Covers geographical area of over 600 square miles
 - Resident population of 6.8 million people (greater during daytime, especially central London)
 - Carries over 5,000 patients every day
 - 2,000-2,500 calls received daily, of which 1,300-1,600 are 999 calls

Computer-aided despatch systems

- Provide one or more of the following:
 - Call taking
 - Resource identification
 - Resource mobilisation
 - Ambulance resource management
- Consist of:
 - CAD software & hardware
 - Gazetteer and mapping software
 - Communications interface (RIFS)
 - Radio system
 - Mobile data terminals (MDTs)
 - Automatic vehicle location system (AVLS)

The manual system to be replaced

- **Call taking**
 - Recorded on form; location identified in map book; forms sent to central collection point on conveyor belt
- **Resource identification**
 - Form collected; passed onto resource allocator depending on region; duplicates identified. Resource allocator decides on which resource to be mobilised; recorded on form and passed to dispatcher
- **Resource mobilisation**
 - Dispatcher telephones relevant ambulance station, or passes mobilisation instructions to radio operator if ambulance already on road
- **Whole process meant to take <3 minutes**

Concept/design of the CAD system

- Existing systems dismissed as inadequate and impossible to modify to meet LAS's needs
 - Intended functionality “greater than available from any existing system”
- **Desired system:**
 - to consist of Computer Aided Dispatch; Computer map display; Automatic Vehicle Location System (AVLS)
 - Must integrate with existing MDTs and RIFS (Radio Interface System)
- **Success dependent upon:**
 - Near 100% accuracy and reliability of technology
 - Absolute cooperation from all parties including CAC staff and ambulance crews

Problems: Procurement (i)

- Contract had to be put out to open tender
 - Regulations emphasis is on best price
 - 35 companies expressed interest in providing all or part of the system
 - Most raised concerns over the proposed timetable of less than 1 year until full implementation
- Previous Arthur Andersen report largely ignored
 - Recommended budget of £1.5M and 19 month timetable for packaged solution. Both estimates to be significantly increased if packaged solution not available
 - Report never shown to new Director of Support Services
- Only 1 out of 17 proposals met all of the project team's requirements, including budget of £1.5M

Problems: Procurement (ii)

- **Successful consortium**
 - Apricot, Systems Options (SO), Datatrak; bid at £937k was £700k cheaper than the nearest bid
 - SO's quote for the CAD development was only £35k
 - Their previous development experience for the emergency services was only for administrative systems
 - Ambiguity over lead contractor
- **2 key members of evaluation team:**
 - Systems manager: Career ambulance man, not an IT professional, already told that he was to make way for a properly qualified systems manager
 - Analyst: Contractor with 5 years experience working with LAS

Problems: Project management

- Lead contractor responsible
 - Meant to be SO, but they quickly became snowed under, so LAS became more responsible by default
 - No relevant experience at LAS or SO
- Concerns raised at project meeting not followed-up
- SO regularly late in delivering software
 - Often also of suspect quality, with software changes put through 'on the fly'
- Formal, independent QA did not exist at any stage throughout the CAD system development
- Meanwhile, various technical components of the system are failing regularly, and deadlines missed

Problems: Human resources & training (i)

- Generally positive attitude to the introduction of new technology
- Ambiguity over consultation of ambulance crews for development of original requirements
- Circumstantial evidence of resistance by crews to Datatrak equipment, and deliberate misleading of the system
- Large gap between when crews and CAC staff were trained and implementation of the system
- Inability of the CAC and ambulance staff to appreciate each others' role
 - Exacerbated by separate training sessions

Problems: Human resources & training (ii)

- Poor industrial relations
- Management ‘fear of failure’
- CAD system seen as solution to management’s desire to reduce ‘outdated’ working practices
- System allocated nearest resource, regardless of originating station
- System removed flexibility in resource allocation
- Lack of voice contact exacerbated “them and us”
- Technical problems reduced confidence in the system for ambulance crews and CAC staff

System problems

- **Need for near perfect information**
 - Without accurate knowledge of vehicle locations and status, the system could not allocate optimum resources
- **Poor interface between crews, MDTs & the system**
 - There were numerous possible reasons for incorrect information being passed back to the system
- **Unreliability, slowness and operator interface**
 - Numerous technical problems with the system, including:
 - Failure to identify all duplicated calls
 - Lack of prioritisation of exception messages
 - Exception messages and awaiting attention queues scroll off top of screen

Configuration changes

- Implementation of the system on 26 October involved a number of significant changes to CAC operation, in particular:
 - Re-configuring the control room
 - Installing more CAD terminals and RIFS screens
 - No paper backup system
 - Physically separating resource allocators from radio operators and exception rectifiers
 - Going 'pan London' rather than operating in 3 divisions
 - Using only the system proposed resource allocations
 - Allowing some call takers to allocate resources
 - Separate allocators for different call sources

So, what happened?

- Changes to CAC operation made it extremely difficult for staff to intervene and correct the system.
- As a consequence, the system rapidly knew the correct location and status of fewer and fewer vehicles, leading to:
 - Poor, duplicated and delayed allocations
 - A build up of exception messages and the awaiting attention list
 - A slow up of the system as the messages and lists built up
 - An increased number of call backs and hence delays in telephone answering

Why did it fail?

- Technically, the system did not fail on October 26th
 - Response times did become unacceptable, but overall the system did what it had been designed to do!
 - Failed 3 weeks later due to a program error
- It depends who you ask!
 - Management
 - Union
 - System manager
 - Government

Lessons learned

- Inquiry report makes detailed recommendations for future development of the LAS CAD system, including:
 - Focus on repairing reputation of CAD within the service
 - Increasing sense of ‘ownership’ for all stakeholders
 - They still believe that a technological solution is required
 - Development process must allow fully for consultation, quality assurance, testing, training
 - Management and staff must have total, demonstrable, confidence in the reliability of the system
 - Any new system should be introduced in a stepwise approach