

HM Fire Service Inspectorate

The Scottish Fire and Rescue Service Command and Control Mobilising System (CCMS)

March 2023

1. INTRODUCTION

1. The Scottish Fire and Rescue Service (SFRS) was created in April 2013 as a successor to the eight Fire and Rescue Service's (FRSs) that existed previously. Each of the eight predecessor FRSs had its own control room providing for the receipt of calls, mobilising resources, communications and associated functions.
2. The SFRS initiated a change programme known as 'Command and Control Futures' (CCF), ratified by the Fire Board in September 2013. The principal intention of CCF was to deliver:
 - a rationalisation of the eight legacy control room structure into a three site control room model with one each located within the three SFRS Service Delivery Areas, and
 - the procurement and provision of what was described as a new technical platform for the control rooms to replace what had been assessed as ageing systems.
3. The CCF site relocation element has been achieved, however the provision of the technical platform has not been achieved despite being subject to procurement and contract award. The awarded contract was terminated in December 2022, four years after award.
4. As Chief Inspector, I had concerns regarding the impact this lack of progress might mean for the operational functionality of the Service. After discussion with the Director General for Education and Justice within Scottish Government, I initiated a short focussed HMFSI inspection to consider the operational consequences of the decision to terminate this contract.
5. The inspection terms of reference influenced the factors that we examined. These are:
 - the rationale behind the SFRS decision that a new mobilising platform was required;
 - the system specification considered by the SFRS;
 - the suitability of systems in place for mobilising SFRS resources;
 - the resilience of the existing systems;
 - the contingency arrangements for system failure;
 - the revised plans and associated timescale for procurement of a new mobilising system following the decision to terminate the contract.
6. We undertook that the outcome of our inspection would report assurance where appropriate, and raise concerns where we felt this was appropriate.
7. I wish to thank the SFRS employees who participated in the visits and interviews for their contribution.

2. OVERVIEW OF INSPECTION OUTCOME

- The SFRS control rooms have legacy CCMSs considered to be well after end of life and the resilience of these systems is accordingly vulnerable. The contract cancellation has impacted the introduction of modern replacement systems.
- The Service has procedures in place to support continuity of service of the control room function and has, where possible, improved resilience.
- The SFRS management is aware of the priority that needs to be placed on replacement CCMSs and has a focus on achieving this.

3. BACKGROUND

3.1 Site relocation

8. The rationalisation of the SFRS control rooms was achieved by vacating five of the legacy control rooms whilst retaining and developing the remaining three thereby achieving the three site model. As a result the Service now has functioning control rooms in Johnstone, Edinburgh and Dundee. Having different sites provides resilience in the event that a site specific event at one location affects the functionality of that location, though the level of resilience is influenced by the interoperative capability of these sites.
9. HMFSI carried out an inspection of the Dundee control room in 2016 following the migration of the functions of the Inverness control room to Dundee. Our inspection report¹ was principally positive in respect of the issues considered and offered a view of the operation of the CCF programme as assessed at that time.
10. There had been an earlier working group report² into the FRS control rooms of the eight Scottish FRSs following the termination of a Regional Fire Control project in England. This group examined the lessons learned from the Regional Fire Control Report and, aware that Scottish FRS reform was under consideration, included general project recommendations in the report.

3.2 Functions

11. A FRS control room requires a number of capabilities to operate. On a basic level these are:
 - **Calls for assistance**

¹ *The Scottish Fire and Rescue Service Operations Control Room in Dundee and Service Delivery and Support in Highland, Western Isles, Orkney Islands and Shetland Islands*: HMFSI 2017

² *FiReControl Learning the lessons*: Scottish Government Stakeholder Working Group, 2011

Traditionally the FRS would receive calls for assistance by telephone. Caller identity can be associated with location awareness. Automated searching can identify history or risk information where stored, or location can be displayed and there is potential for incorporation of geocodes. Looking forward, there may be the potential for situational awareness such as visual footage from camera phones to assist with mobilising and informing attending crews.

- **Mobilising of resources**

The control room system needs to know the location and availability of resources. FRS resources have become more complex with specialist attributes being developed in response to changes in risk and the role of the FRS. A resource based mobilising system will identify the resources with the necessary attributes that are best placed to attend, based on availability, location and journey time.

- **Communicating with resources**

Traditionally communication is by radio, using voice or data. Though having other communication channels with real time information available to resources may obviate the need for control staff to respond to requests.

- **Statistics, analysis and audit reporting**

A reporting function will facilitate these.

- **Future needs**

A system might have the ability to be modified and adapted within its lifespan to accommodate changes or additions to functionality, though it may be difficult to know what demands and changes the future may bring.

4. INSPECTION FINDINGS

4.1 Why a new mobilising platform was necessary

12. The three OCs are equipped with a CCMS that was considered to require replacement because each was deemed to be at end of life. The systems required specialist support arrangements due to their age and were reliant on older hardware, the supply of which was likely to become more difficult to source over time. The systems did not offer interoperability between control rooms, and the process of procuring a single platform was seen as an opportunity to improve resilience and efficiency by enabling fully functional interoperability between the control rooms.
13. Work was carried out to each of the three existing CCMS in place as part of the merger process of control rooms in the three SDAs; West (2014), East and North (2016). The adaptations involved merging data and information to allow the control rooms to continue to function for the whole of the SDAs.
14. Due to the age of the systems, these adaptations resulted in OC systems requiring several manual processes in order to effectively handle calls and mobilise resources. These adaptations were seen as a 'stop gap' until a new CCMS could be sourced and implemented.

4.2 The system specified

15. The SFRS decided that it would require a single proven Command and Control supplier to design, supply, install, commission and maintain the system. The SFRS' specification of requirements included:
- A CCMS which would provide everything from management of telephony and radio calls to dispatch of resources, incident management, records management, provision of full audit log and support for mobilised resources.
 - Interoperability by incorporating the ability to intelligently route calls to the most appropriate OC in Scotland, and to allow any Scottish OC to manage telephony and radio calls from anywhere across Scotland to mobilise the most appropriate SFRS resource regardless of the OC or resource location.
16. The specification for the new system was lengthy, detailed and prescriptive and the view has been expressed to us, with the benefit of hindsight, that the original specification was overly detailed and prescriptive.
17. As a consequence of the large number of requirements and the amount of detail in the original specification, a number of prospective suppliers were deemed to be unable to fulfil the requirements.
18. Systel; (Systèmes et Telecommunications), a company based in France, was the only applicant declaring the ability to fulfil the requirements, and was awarded the contract in January 2018.
19. The SFRS then ran the project with a project team and received external scrutiny and major project assurance from the Scottish Government Digital Assurance Team.

4.3 The performance and resilience of the existing CCMSs

20. In a FRS control room, the technical systems and equipment used need to be fit for purpose and interoperability between control rooms allows resilience arrangements to operate. We examined the position in the three SFRS control rooms.
21. The two main components of each OC's CCMS are an Integrated Communications Control System (ICCS) for radio and telephony and a Computer Aided Dispatch (CAD) system for mobilising, gazetteer and mapping - along with peripheral supporting systems such as on call resource availability.
22. It should be mentioned that there has been some investment in SFRS infrastructure in recent years relative to the planned implementation of Systel. It is understood this work and investment has not been wasted and it is envisaged that this will facilitate any new CCMS implementation. Examples of this infrastructure include standardisation of station-end equipment and network capability (WAN – Wide Area Network) and the rationalisation of call-signs programme. There has also been the implementation of SIP (Session Initiation Protocol), which improves resilience by having links to more than one telephone exchange. SIP is not yet functional at Dundee OC (DOC) and Edinburgh OC (EOC) due to the inflexibility of current systems.

Dundee OC (DOC)

23. The system at DOC is Vision, which is a combined ICCS and CAD system. The system is newer than those in place at Johnstone OC (JOC) and EOC. However, being originally installed in 2006 it is still considered an old system and relies on old hardware which has become difficult to source replacement parts for.
24. The system is a different version of the Vision system in place at EOC, though is supported by the same supplier under the same support contract. Due to being a different version than at EOC, there is no interoperability potential between the systems.
25. There have been significant issues in recent years regarding the integrated telephony system at DOC which resulted in considerable attention by SFRS ICT and the support contractor to rectify.
26. A decision has been made to limit the volume of data on the system to improve resilience. The result being that some address related information is held separate to the system itself, which has involved a manual element for operators.
27. DOC has an integrated ICCS, which means there is a single point of failure. If any part of the system fails, it all fails. However, the arrangements in place at the Dundee Standby facility is a standalone ICCS, which gives more flexibility if one part of the system fails.

Johnstone OC (JOC)

28. The systems in place at JOC are Motorola Procad and Capita/Sungard. The systems generally function as required and allow JOC to carry out the required functions in the West SDA.
29. The CCMS at JOC was inherited from legacy arrangements and was adapted when the West SDA OCs merged in 2014. This resulted in some loss of functionality and some manual processes for OC personnel were implemented as a consequence. An example of this is OC staff having to manually update certain availability at change of shift, which was an automated process previously.
30. The system is now considered to be old technology, although the software itself is understood to be fairly reliable in terms of its stability. However, the hardware is dated and finding replacement parts when required is likely to be difficult to achieve, time consuming and costly.
31. The SFRS has a support contract in place with Motorola. The Service has some concerns around the availability of expertise to provide support in the long term.

Edinburgh OC (EOC)

32. The Systems at EOC consist of Northgate ICCS and Vision CAD system.
33. There are a number of manual processes which have become practice for operators handling emergency calls. This is mainly as a result of the merging of legacy control rooms in 2016 and the inflexibility of not being able to incorporate elements of other legacy CCMS into the current system. There is understood to have been some upgrade to the current system in 2016 as part of the merger process.

34. The server which hosts the CCMS for EOC had not been restarted for six months at the time of our visit in late December 2022. This is due to concerns over the system's resilience following previous difficulties which arose when attempting to carry out this process. All required changes have been stored to allow update in due course. A decision has not yet been communicated on when and how the server will be updated. As a result of this, there are six months' worth of information and data which has not been uploaded onto the system. This includes information on Flexi Duty Officers' details and certain mobilising instructions. All amendments to be added are communicated to personnel, but this results in control staff having to refer to various sources of information, some papered as a work around. We were advised that the system does not often fail on its own.
35. EOC is working on Vision version 3. A support contract is in place with SSS Public Safety. Version 3 is an older system relying on ageing hardware.
36. In addition to the system failure risk due to age, the control room suite has major building issues with rainwater ingress which poses a risk to resilience.

4.4 Contingency for system interruption

ICT and Supplier Support Arrangements

37. All three OCs have a process for raising faults and issues relating to their CCMS, which involves submitting a request for assistance with SFRS ICT department as a helpdesk request. There is an OC/ICT Service Level Agreement, and fault response is graded by impact. The prioritising and addressing of faults helps to ensure business continuity at each OC.
38. SFRS ICT department staff rectify faults for issues relating to the SFRS supplied hardware or software. For faults relating to supplied CCMS software or hardware, there are two support contracts in place (Motorola for JOC, and SSS Public Safety for EOC and DOC). Staff from the ICT department liaise with suppliers directly to try and facilitate a remedy for the reported fault. Both SFRS ICT and the support contractors provide support outside normal business hours.
39. The support contracts in place run until July 2023 for JOC, and March 2023 for EOC and DOC.
40. As all three CCMSs use old technology, the Service has some concerns around whether the level of expertise to provide the required support will be available in the long term.
41. The SFRS ICT department is aware of the fragility of the systems and as a method of managing system capacity and resilience system restarts and updates are managed and controlled. System updates are completed with the relevant system support contractor's advice and involvement. In some cases, data additions and server updates have been held back due to concerns over capacity and fragility of systems.
42. The SFRS has concern over one of the support suppliers' ability to provide continued service for an ageing product beyond the calendar year of 2023 due to the age of the system. To this end, SSS Public Safety is providing its current support on a 'reasonable-endeavours only' basis, reducing assurance and highlighting concerns regarding the fragility of the system in use at EOC and DOC.

Business Continuity

43. All three OCs have local buddy arrangements in place. In the event that one of the OCs cannot take a 999 call, due to spate calls or system failure for example, the call will be diverted by BT to another OC. DOC and EOC are 'buddies' as are JOC and Northern Ireland Fire and Rescue Service Control. This arrangement provides assurance that 999 calls can still be received by control staff even in the event of issues referred to above.
44. There is also a UK system in place - Operation Willow Beck³. This is supported by the National Fire Chiefs Council (NFCC) and has been designed in collaboration with the Home Office and key partners to mitigate increased emergency call volumes during spate call conditions. This call distribution process allows BT to route calls to control rooms with capacity, without over-burdening a single buddy control room. SFRS has not experienced outwardly routed calls due to spate conditions, but has handled calls for other FRSs when Operation Willow Beck has been implemented. We were advised by staff that this arrangement also offers resilience if one of the SFRS OCs cannot handle calls due to a system outage.
45. As each of the OCs are operating on different systems, they are not able to mobilise resources to incidents within another SDA at short notice. Typically, a 'buddy' OC would log calls and ultimately pass these back to the OC to mobilise resources to. If the system outage was to last for a longer period, all OCs have the ability to implement 'Crash Laptops' to be able to mobilise resources in another SDA.
46. The provision of backup servers provide resilience that if one server fails, the back-up option, although not necessarily instantaneously, would enable the functionality of CCMS after a period of down-time.
47. Each OC has a number of laptops to use as back up if their own system fails, or as business continuity if another OC has a total system outage. These fallback arrangements require a level of manual intervention by operators.
48. Each OC has a standby facility at a physically separate location to allow staff to relocate to if the OC site is unusable due to building access and use issues, for example. These locations involve staff travelling to the alternative site, and arrangements are in place to facilitate travel. However, this arrangement would still rely on the use of crash laptops in the event of a total system outage. Equipment available at Standby locations are tested regularly, though due to staffing having been at consistently low levels the weekly testing regime has not always been consistently maintained.
49. The provision of stand-by locations would not be necessary if there was a system of full interoperability between the OCs, but at present the stand-by arrangements provide a degree of resilience for continuity of functions.
50. Each OC has a Business Continuity Plan and Evacuation Plans are in place which are tested regularly. These plans have been tested but there has not been an exercise to incorporate the scenario of a prolonged downtime of any CCMS.
51. The SFRS has procured a disaster recovery option of CCMS, 'Vision 5' for use in DOC and EOC, due to the Systel system not being implemented. This was a condition of the ongoing maintenance contract. We were told, "*This is to see us through this period until a*

³ [National Fire Chief's Council News article, May 2022.](#)

new system is in place. However, due to system difficulties, this disaster recovery version is not yet fully installed.

52. The fact that the three OCs use a different CCMS with no interoperability means that in the event of total failure of a single system, the other two systems will not be directly affected by the other CCMS' fault. Consequently, at any one time, only one OC will be directly impacted by the total failure of a CCMS.

4.5 Other factors

Technology Changes and Key Dates

53. There are some pending key dates, which impact on the priority to modernise the current CCMS at all three OCs.

The implications of the ISDN (Integrated Services Digital Network) switch off means that all three current CCMS will not be compatible with replacement technology from December 2025. Furthermore, the Home Office is delivering a new Emergency Services Network (ESN) which will replace the current Airwave radio system used by Emergency Services, the deadline for which for SFRS is also anticipated to be towards the end of 2025.

54. If the Systel Contract had been successfully implemented on time, technology changes would have been accommodated in a new system. The impact of a delay to implementing a replacement CCMS results in an increased risk of having equipment in place which is not compatible with the ISDN switch off and ESN implementation.

Consideration of electricity outages

55. SFRS has included in its overall resilience planning the consideration of power outages. Each Standby Control has back-up generators in place which are tested regularly. In the event of a mains electricity outage, in order to limit the impact of a change over from mains electricity to fuel powered generator supply, there has been investment in the UPS (uninterrupted power supply) backup systems at OCs. This has been carried out with the aim of reducing the risk of a potential 'cold start' of a server. A 'cold start' is an unplanned shut-down of a server, which would then require to be restarted from cold. There are concerns due to the fragility of systems that a cold start of a server could result in a significant system failure which may be difficult to recover from.

Staffing Levels

56. The OCs each have different workload demands and therefore different staffing arrangements. Staffing levels at all three OCs have been impacted as a result of staff turnover and absence. There has been a reliance on overtime on a regular basis to be able to maintain minimum staffing levels in OCs.

5. THE WAY FORWARD

57. The SFRS management acknowledges the pressing requirement of sourcing, implementing and establishing suitable CCMS to replace current systems and apply the resources and focus to make this happen.

58. To accommodate network and telephony technological changes, replacement CCMS system(s) should be in place by summer 2025. This is to allow a period of settling prior to the ISDN and ESN network changes towards the end of 2025.
59. Having terminated the Systel contract, the SFRS is undertaking procurement afresh of a new CCMS system. The first stage of this is the appointment of a Client Advisor and this element is anticipated to be in place by February 2023.
60. The system procurement process itself is expected to take around nine months. The Service considered different procurement route options and has opted for what it believes to be the most appropriate in light of the prevailing issues of desired timescale and risk of challenge. There is also the potential to use supplier pre-qualification within an existing Emergency Services command and control systems framework, to accelerate the procurement process.
61. The Service may source and implement 'off the shelf' replacement systems to improve stability and meet deadlines in the short term. This seems an obvious strategy given that the original desire to create a bespoke system may in part have had an influence on the supplier's ability to deliver. Systems may be introduced as stand-alone without interoperability between OCs. This may be viewed by some to discount one of the original drivers of improved resilience and efficiency by enabling interoperability between OCs. The long term solution may still be the provision of a single CCMS spanning across the three OCs achieved by the procurement and implementation of three separate CCMS systems to be provided by the same supplier and set up with the same configuration which may allow future interoperability.
62. We spoke to a selection of staff with knowledge of the operational and technical requirements. They are confident that the target of establishing replacement systems by 2025 is achievable, though there are challenges involved. However, they also highlighted the importance of getting things right in terms of procurement, appointing of a competent supplier and maintaining focus by prioritising implementation.
63. There are thought to be a number of blue light services in the UK commencing procurement for CCMS at a similar time to the SFRS, and there may therefore be challenges in terms of supplier capacity to deliver.
64. There has been significant turnover of personnel over the period of the Systel project. As an example, there have been five different Senior Responsible Officers and seven project managers. We think it important that the Service puts in place suitable project team members to drive the project forward and maintain focus.

6. CONCLUSION

65. The SFRS has three control rooms each with old CCMS systems which are at end-of-life. The risk of system failure is acknowledged by the Service and is high on the SFRS risk register. The implementation of a Systel system would have replaced the old systems. Contrary to its plans, the Service is in a situation which requires it to start new procurement and subsequently an implementation process, whilst maintaining the current systems for longer than had planned.

66. The SFRS has two support contracts with external providers to support its current systems. Due to the age of the systems, one of the contractors will only commit to a 'reasonable endeavours only' basis of rectifying issues.
67. The contingency measures the SFRS has put in place provides assurance that 999 calls will continue to be answered. However, in the event of a total system failure, the manual work arounds to carry out functions of the OC may impact significantly on staffing, depending on the length of time a CCMS is down.
68. There has been testing of evacuation and business continuity plans. However, it is understood the scenario of a prolonged downtime of any CCMS has not been tested, the potential for which is foreseeable and should be considered by the SFRS' management.
69. In order to maintain and prolong the CCMS systems, the SFRS ICT department arrange careful management of system updates assisted by external support contractors.
70. The Service has taken advice on improving resilience of systems by optimising power supply arrangements and procuring a disaster recovery option for two of the systems.
71. The management of system updates and limiting the addition of data within some elements of systems has resulted in the creation of operational workarounds for control staff, the level of which vary between control rooms.
72. The three CCMS systems in place are not compatible with changes which will occur toward the end of 2025. These are the ISDN switch off and the Home Office implementation of the Emergency Services Network (ESN) to replace the Airwave radio system. The replacement technology to accommodate this must be fully established prior to this date.
73. Establishing replacement CCMSs to the above timescales appears achievable, but with time constraints now at a critical level, it is important that the SFRS management provide appropriate support and resources to the CCMS project team and completion of this project as a priority.
74. Due to the tight timescales to complete the CCMS project, skill-set and continuity of the project team is an important factor which should be considered by SFRS. The Service should evaluate requirements against the skill-set available to support their focus of achieving the sourcing and implementation of a fit for purpose CCMS within the time deadline.

Glossary

CAD	computer assisted dispatch
CCF	Command and Control Futures
CCMS	command and control mobilising system
DOC	Dundee Operations Control
EOC	Edinburgh Operations Control
ICCS	Integrated communications control system
JOC	Johnstone Operations Control
OC	'Operations Control' the SFRS designation for control room
SDA	Service Delivery Area

Appendix

About HM Fire Service Inspectorate

His Majesty's Fire Service Inspectorate in Scotland (HMFSI) is a body that operates within, but independently of, the Scottish Government (SG). Inspectors have the scrutiny powers specified in section 43B of the Fire (Scotland) Act 2005. These include inquiring into the state and efficiency of the SFRS, its compliance with Best Value, and the manner in which it is carrying out its functions.

HMFSI Inspectors may, in carrying out inspections, assess whether the SFRS is complying with its duty to secure Best Value and continuous improvement. If necessary, Inspectors can be directed by Scottish Ministers to look into anything relating to the SFRS as they consider appropriate.

We also have an established role in providing professional advice and guidance on the emergency response, legislation and education in relation to the Fire and Rescue Service in Scotland.

How this inspection was carried out

This inquiry is self-directed by HM Chief Inspector.

The Inspection team members were:

- Robert Scott QFSM, Chief Inspector
- Brian McKenzie, Assistant Inspector (Lead Inspector)
- Iain Cameron, Inspection Officer (Seconded from the SFRS)

All the members of the inspection team contributed to the development of this report and the quality assurance provided a professional challenge to the contents, assumptions and conclusions made.

Our report reflects the circumstance at the time of our visits and interviews which were undertaken between December 2022 and January 2023.

This inspection was not a comprehensive in-depth audit, albeit it is sufficiently detailed in order for the Chief Inspector to give a professional judgement on the activity and suitability of the Service's arrangements within an operational context.

Methodology

A draft outline was prepared which defined the scope of the inspection.

We undertook a desk-top review of the documents supplied to us by the SFRS.

We visited each of the SFRS control rooms and spoke with a manager and, where it was possible, a staff member.

We interviewed relevant SFRS managers and employees involved in the project.