Scottish Ambulance Service

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NHS SCOTLAND

Medical Gases

September 2025 Audit Report And Next Steps

Report for Scottish Ambulance Service Executive Team

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1. Purpose of Document

The Scottish Ambulance Service rents medical gas cylinders from the company, BOC, and following a number of SAS audits, [redacted]

The Service has taken a number of steps to improve the management of cylinders. This includes a SAS app that has been developed and successfully tested to record and subsequently track individual cylinders, in addition a new dedicated role of Medical Gas lead, has been created to lead on the implementation of the stock control improvements.

[redacted]

In addition KPMG has undertaken an internal audit of medical gas controls and processes with recommendations for improvement. This, whilst aligning to work that was already in place provides further scrutiny and review. The KPMG report was approved by the SAS Audit and Risk Committee on the 16th October 2025.

The Medical Gases project (MGP) is a key element of the SAS Best Value Programme, which is in place to lead service improvements and financial efficiencies. The MGP is leading on the implementation of the improvement work required to avoid the loss and financial impact of further cylinders. Progress of this work is being reported to the SAS Performance and Planning Steering Group and the SAS Audit and Risk Committee.

This document describes the approach and reports the results of the recent Medical Gases audit that ran 19th – 20th September, 2025, this was utilising the SAS App. The paper also references the wider SAS improvement work being led by the MGP.

This paper specifically describes:

- The approach taken to the Service-wide audit to identify the cylinder stock at stations, workshops, co-location bases, and on vehicle fleet. In addition, third party locations such as hospitals and GP Practices were searched, and Community First Responders, BASICS Responders and Mountain Rescue Teams were asked to provide details of their current stock

- A summary of the audit results, most notably the number of cylinders accounted for and unaccounted for, compared to the stock holding position the day prior to the audit.
- [redacted]
- [redacted]
- Building upon the existing work and the recent KMPG audit, the actions with respect to increased focus on clinical responsibilities, stock management, reporting and monitoring of medical gas usage

[redacted]

The project plan led by the MGP is now being updated to reflect the outcome of the audit, the recommendations from KPMG and the Medical Gas lead responsibilities and will be reported to the appropriate governance groups throughout 25/26. Following final wash up of the audit, the approved write off will be actioned.

2. Background

There is evidence that the Service's medical gas cylinder stock holding currently exceeds clinical requirements. In 2019 there was a review of the quantity of gas cylinders on the primary vehicle fleet. At that time a clinical agreement was put in place regarding the cylinder stock expected to be held on Accident and Emergency (A&E) ambulances and Patient Transport Vehicles (PTVs). The SAS Medicines Management Group are currently providing updated guidance on gas quantities to be held on other vehicle types that routinely carry gases and to consider safe and appropriate stock holding levels in gas stores.

To date, there has not been the facility to accurately track cylinder movements, nor understand usage rates, re-ordering patterns or other variations in gases disciplines between stations. Currently BOC delivers cylinders directly to 83 stations/co-location bases and scan cylinders into its system to charge rent. 'Hub' stations order stock from BOC via a secure online account and return used cylinders, at which point BOC removes cylinders from their system and cease charging rent. All 'Spoke' stations and bases replenish stock from one of the 83 delivery locations. To illustrate the rapid rate of cylinder rotation and give context to the frequency of ordering and volume of external cylinder movements, [redacted]. Orders are typically like-for-like but there is evidence that some stations stock holding has increased and re-ordering patterns are currently being examined.

To add further context, the oldest cylinder in current inventory was delivered on 26/09/2012 and expired just over 10 years ago. Although an outlier, this highlights a limitation of not having a system to track cylinders and be informed with details such as delivery date, delivery location and expiration date. With better insight that the

Service will achieve by implementing appropriate control measures, cylinders will no longer go undetected in this way.

One highly significant control measure is the Service's ICT department cylinder scanning App which has been instrumental to help identify cylinders and then allow SAS to address these deficiencies, balancing the requirement to have cylinders for use in patient care.

Assisted by the App, a further Service wide audit has been undertaken to quantify the true number of cylinders within the Service and thereby also quantify the cylinders currently liable for BOC rental which have not been found.

3. The Audit Approach

Applying the lessons learned from audits in previous years and more recently in Dec '24, Feb '25 and Mar '25 to maximise coverage and address the incomplete results, a detailed audit plan was developed, executing a multi-pronged communications plan to help inform and drive full participation with senior stakeholder engagement. This included a user guide and drop-in sessions to assist staff to familiarise themselves with the App and get prepared as well as a clinical bulletin to convey the importance of clinical staff taking personal responsibility for this medical commodity. Unlike previous audits, it was also agreed to undertake the audit over a 48 hour period on a Friday and Saturday to balance crew participation and ease of access to vehicles. The Fleet department was also asked to take responsibility for collecting data with regards to vehicles off the road due to maintenance, repair or in police impound or with the procurator fiscal.

Unlike previous 'paper audits' the scanning App also allowed for multiple scanning of the same cylinder, which encouraged the use of scanning all cylinders multiple times to ensure none were missed. Resources were also placed in the Ambulance Control Centre using communications aligned to vehicles to crews all over the weekend. In addition specific work was undertaken with the HALO's at hospital sites and Advanced Practitioners at GP Surgeries.

As a result this audit has had the greatest coverage and input from SAS staff.

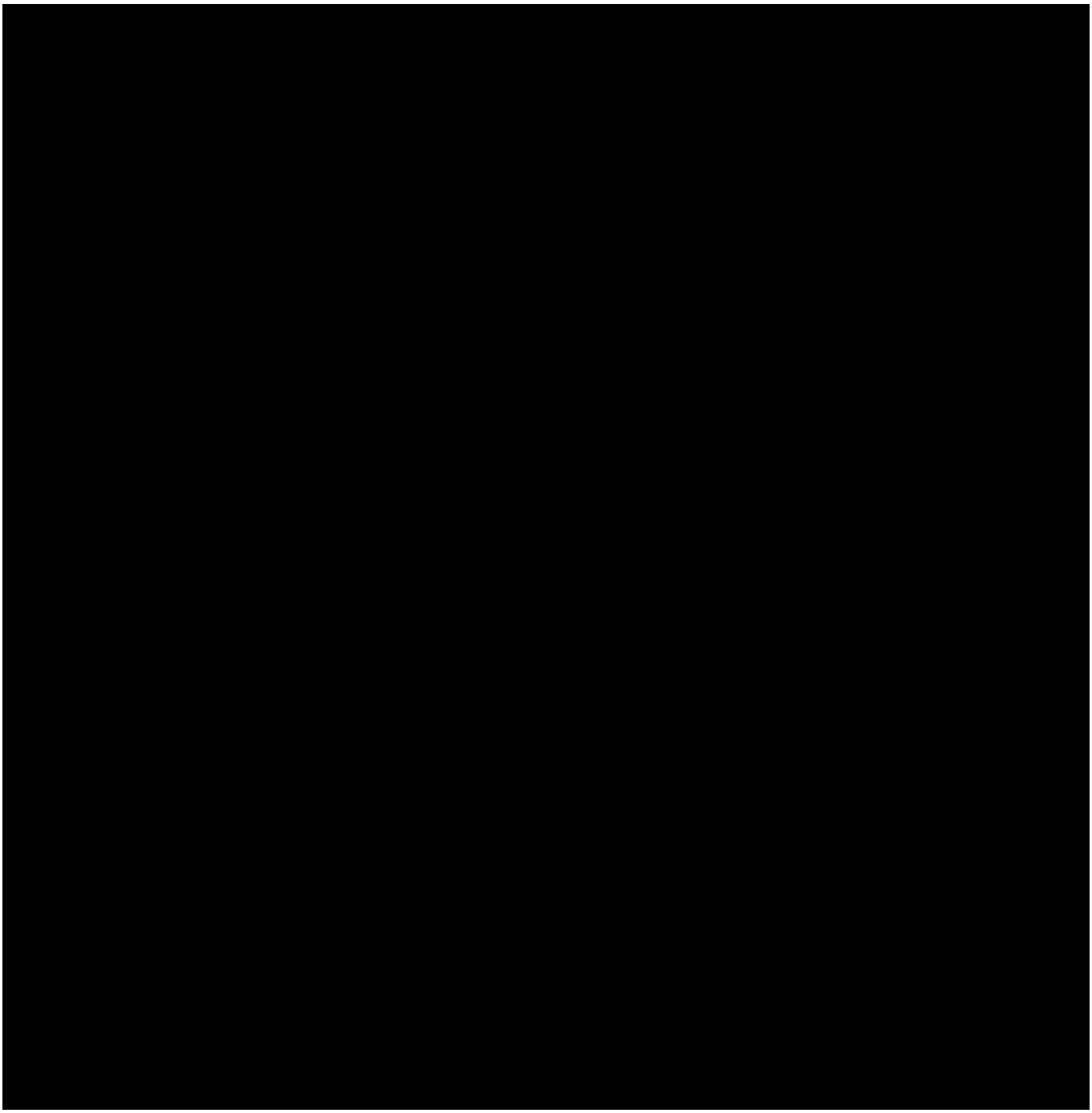
4. Audit Results

[redacted]

[redacted]

It should be noted that as part of follow up actions from the audit gap analysis, there is some washup required including additional vehicles, further work with GP surgeries and a further physical audit around the stations with the highest missing numbers. [redacted]

[redacted]



6. The Rollout Approach

Given the relative success of the audit and to maintain enthusiasm and momentum, it has been agreed to expedite the introduction of routine scanning by frontline A&E crews as cylinders are moved between locations. Whilst there are some local measures to complete, there are no technical barriers to proceeding with a test of change, prior to the commencement of winter pressures. This has also been recognised within the KPMG audit.

In parallel with this, the further administration with respect to App access for eligible staff can be completed e.g. for trainees and newly qualified staff, and a further campaign to increase Service smartphone adoption and usage will be progressed. The other key priority is to further define and develop reporting standards to meet the clinical and financial requirements. An understanding of medical gas usage trends will be assisted by reporting to a granular level on vehicles, stations and staff.

The Medical Gases Lead is due to commence on the 20th October and will oversee and lead the success of the proposed App test of change, rollout and the implementation of improved control measures, policy development and standard operating procedures.

It is reasonable to expect that following a successful test of change, the full rollout should commence early in the New Year, following the end of winter pressures. Over the winter period there will remain a communication plan in place reminding staff of the importance of tracking cylinders.

Through the communication plan, regional management teams will be reminded of local accountability and high crew adoption rates of the App. The communications will

be led by the clinical team and linked to professional clinical responsibility and obligations of clinicians to drive usage and adherence.

The feasibility of help from Foundation Leadership Graduates to help facilitate and locally support the rollout is also being explored with the SAS OD team..

8. Future Reporting and Monitoring (BAU)

From 26/27 when routine cylinder scanning becomes business as usual, there will be a requirement for all A&E ambulance crews to reflect every cylinder movement between vehicles, stores and when exchanged with other services on scene, or left at hospitals.

This will generate a wealth of accurate data that will continuously improve the Service's understanding about gas usage, including ordering frequency, practices of recovering cylinders from hospitals and other emergency services, and a re-evaluation of stock holding on specific vehicle types and the minimum and maximum thresholds to optimise stock holding in stores. The App will make it possible to track internal cylinder moves across the Service and identify crews and vehicles who are routinely using the App, as well as any non-compliance.

By making linkages between vehicles, stations sub-regions and regions, reports will help the Service optimise re-ordering e.g. in Forth Valley all deliveries are to Falkirk which services 5 other stations in the sub-region, with a similar "hub and spoke" model found throughout the Service.

9. Recommendations and Next Steps

The immediate actions are to conclude the ‘wash-up’ of the audit with particular reference to

- Undertaking a physical audit (as a final check) in those stations with the highest ‘unaccounted for’ cylinders and a
- A final review of all vehicles in Service how have not had medical gases scanned during the audit
- A final review of CFR, BASICS and Mountain Rescue Teams

[redacted]

The project plan for all of the service improvements in stock management, control, ordering and scanning is being updated and will be implemented through the MGP. Given the significance, this group is meeting fortnightly. The Medical Gas lead post is due to commence on the 20th October and will be key to implementing this action plan.

[redacted]

[redacted]

[redacted]

Medical Gas Project
October 2025