

**Report by the  
Comptroller and Auditor General**

**The National Health Service  
in Scotland**

**The Scottish  
Ambulance  
Service: A Service  
for Life**

Laid before the  
Scottish Parliament by  
Scottish Ministers  
6 December 1999

# Executive summary

## Introduction

**1** In this report we examine the achievements and performance of the emergency ambulance service of the Scottish Ambulance Service (the Service). In Part 1 we detail the Service's role and how in serving patients they work in partnership with other agencies of the NHS in Scotland. In the rest of the report we consider:

- The speed and responsiveness of the emergency ambulance service (Part 2)
- Economic and efficient use of resources (Part 3)
- Providing effective pre-hospital emergency care i.e. clinical aspects (Part 4)

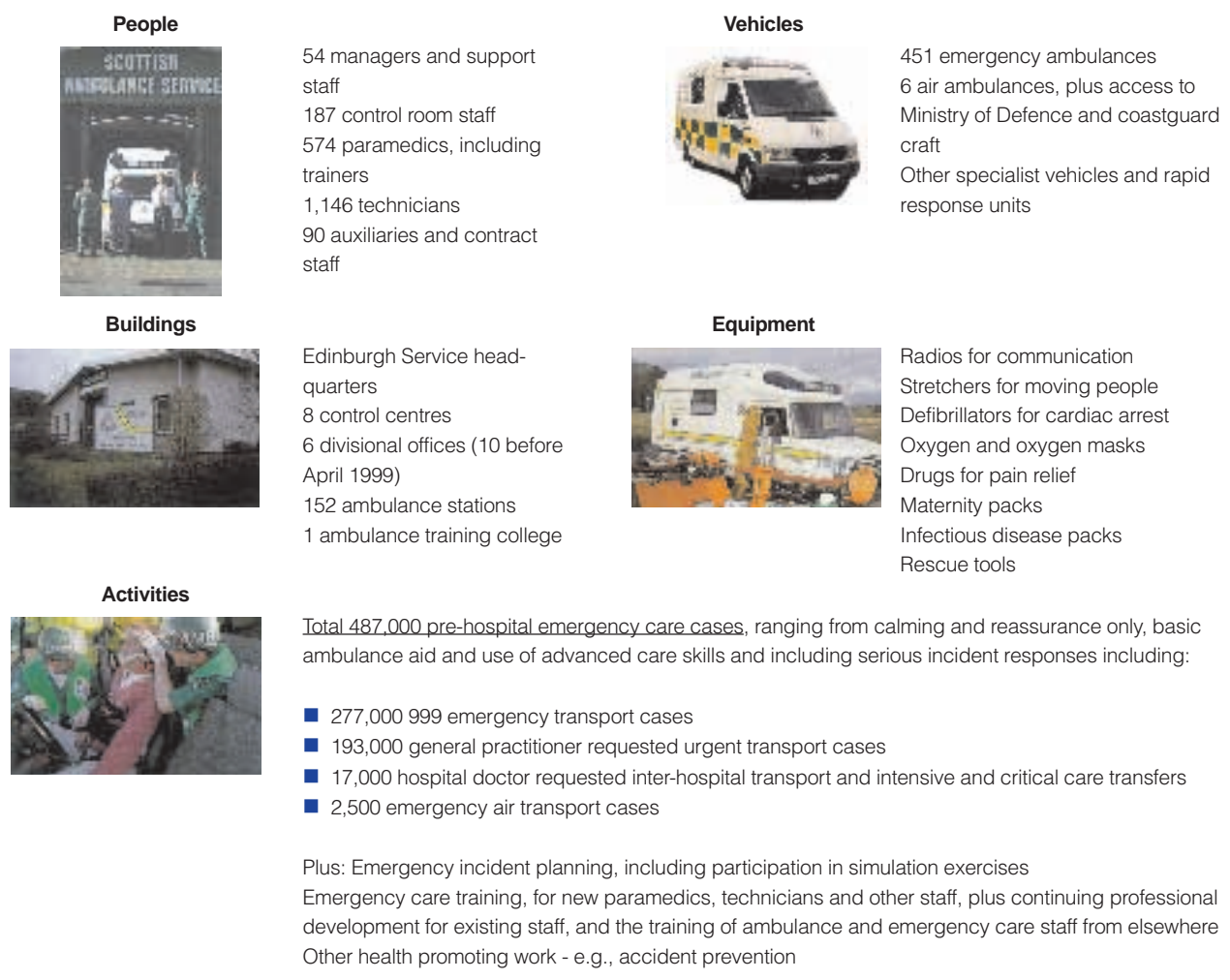
**2** Our main recommendations for the emergency ambulance service are at the end of this summary.

## The role and objectives of the Scottish Ambulance Service (Part 1)

**3** The Service are responsible for ambulance services across Scotland, at a total cost of some £86 million in 1998-99. This is a small proportion (two per cent) of the NHS in Scotland's total costs of some £4.6 billion that year. But the Service's role of providing a service to patients and supporting other health professionals across Scotland means their activity can have wider impacts on other NHS expenditure.

**4** In 1998-99 the accident and emergency service cost £67 million, nearly four-fifths of the Service's total costs. Accident and emergency ambulance crews provide pre-hospital clinical care, in some cases advanced life support, whilst transporting patients to hospital accident and emergency departments and acute wards. Most of the work arises from 999 calls made by the public, which require an immediate response. The same teams also respond to general practitioners who request urgent rather than immediate transport of patients to hospital. The Service's 1,720 front line staff and 451 emergency ambulances dedicated to this work made 487,000 emergency and urgent ambulance responses in 1998-99 (Figure 1).

**Figure 1** Scottish Ambulance Service - Emergency service main resources and activities 1998-99



Note: This Figure is illustrative of the Service's main resources and activities, not a comprehensive list

Source: National Audit Office

**5** Important changes affecting the Service in the 1990s include a greater emphasis on their contribution to clinical care, and administrative and management changes including establishment of the Service as a Special Health Board in April 1999 (Appendix 1 details the Service's organisation, management and responsibilities). There has also been growing demand for emergency ambulances, with 15 per cent more responses now compared to 1994-95 including 28 per cent more 999 responses<sup>1</sup>. Partly the Service have met the

1 Demand from doctors' urgent calls, about 40 per cent of current emergency ambulance work, has hardly changed since 1994-95.

increased demand through improved management and productivity but they have also received more resources. In real terms they received 11 per cent more resources in 1998-99 than in 1994-95, including 18 per cent more for the emergency service with specific extra funding for various operational and patient care improvements.

**6** Appendix 2 summarises our methodology, including a range of work completed jointly with the Service and comparisons made with other ambulance services in Britain. We also consulted and undertook research amongst healthcare professionals, other NHS staff, patients and patient representatives in Scotland to gain their views on the performance and development of the Service.

**7** The main exclusion from this report is the Service's non-emergency patient transport service, which is responsible for some 2.4 million patient journeys a year and represents some one fifth of the Service's expenditure. These journeys include both high dependency and more routine patient transfers where there is a greater degree of pre-planning possible. The challenges and issues that this service must address are distinctively different from those of the emergency service. In early 1999 the Service announced a fundamental review of their patient transport services, which is due for completion during 2001.

## **Providing a rapid and responsive emergency service (Part 2)**

**8** An ambulance service must respond rapidly to people who need emergency medical help. In Part 2 of this report we present our analysis of the Service's performance in responding quickly to 999 calls and to general practitioners' urgent calls for patient transfer to hospital.

### **Response times are slower than target in some areas**

**9** The Service answer 999 telephone calls made to them on average within 10 seconds. Thereafter, the speed with which emergency ambulances arrive at the scene of each incident, against the increase in demand of 28 per cent over the last five years, has remained largely constant. In more than half of cases an ambulance crew is on scene within 10 minutes and in 95 per cent of cases they attend within 19 minutes. In response to general practitioners' urgent calls where demand has remained constant, the Service transport over 90 per cent of patients to hospital within the required time. For most areas of Scotland response times compare reasonably with those that other ambulance services in Britain achieve.

**10** However, while there are high performing ambulance services in parts of Scotland, other parts are not achieving the required response targets. Ambulances do not meet their response time targets not only in the more remote, sparsely populated areas, where ambulance stations are necessarily fewer, but also in the busy, populous areas of Scotland such as Glasgow and Lothian.

**11** Performance against the response time target reveals the greatest scope for improvement in Glasgow. Here only about one in three ambulances reaches the scene of a 999 incident within seven minutes, against a target of one in two. However the Service have taken a range of actions to secure improved response times in Glasgow, and these are starting to show some evidence of improvement. It is also important to recognise that the 443 responses a year that on average each front line ambulance crew member in Glasgow makes is amongst the highest workload of any ambulance service in Britain.

**12** The most common causes for long response times appear to be temporary peaks in demand which exceed the ambulance resources available at the time and, in more remote areas, travelling distances. However there is a complex balance between demand, responsiveness and ambulance resources, and it is not simply a question of increasing resources to improve responsiveness. We discuss this balance and the related question of operational efficiency below and in Part 3.

### **The Service need to address how they can better match emergency ambulance responses to health needs**

**13** An important aspect of responsiveness is how well ambulance services can react to how ill a patient is. Priority dispatch is a relatively new approach by which emergency ambulances respond to calls according to their relative urgency in order to improve response times to the most seriously ill patients and ultimately save more lives. (Appendix 3 gives further details.) Although many ambulance services in England are introducing priority dispatch for universal adoption there by 2001, in Scotland there is no decision about whether to move away from the existing system of ambulances responding to patients on a first come, first served basis, regardless of how ill they are.

**14** We completed a joint clinical audit project with the Service categorising the needs and pre-hospital care of a large sample of patients (4,460) transported by ambulance in Scotland during one week in November 1997. This research confirmed that, in Scotland, how ill a patient is does not affect how quickly an ambulance arrives, nor subsequently to any great extent how quickly the patient reaches hospital.

**15** Our work showed that patients who turn out to have no or only minor injuries may account for one third of all 999 ambulance responses and still benefit from rapid response and pre-hospital times (average nine and 32 minutes respectively). This does not imply that no such patients require an ambulance, because cases which involve no or only minor injury include those where it is necessary for a doctor in hospital to make a diagnosis, and it is better to be safe than sorry. However many calls in this category, albeit they are genuine calls for help meriting some form of response, clearly do not justify the same priority as a life-threatening emergency. Giving these less urgent calls the same priority as more serious cases means that some very ill and moderately ill patients who would benefit more from early treatment wait longer before an ambulance can attend.

**16** Our survey research about the Service amongst healthcare professionals, other NHS staff and patient representatives showed that over 90 per cent of these users support the concept of the Service moving towards priority dispatch provided, as should be possible, the Service manage the risks of implementation effectively. It is therefore important for the Service and the Scottish Executive Health Department to determine, in consultation with the other areas of the NHS affected, whether and how best to take forward implementation of any new system.

**17** While these findings suggest that there is a good case for the Service to consider a different approach to emergency ambulance deployment such as priority dispatch, there is also a need for caution. Re-designing ambulance response systems carries risk and may be costly. It needs to be clear, therefore, that priority dispatch will in practice permit faster ambulance responses to the more serious incidents and will command the confidence of patients and the rest of the NHS. It is also important to recognise that implementing a full priority based dispatch system that does not result in a slower response than present to the least serious incidents may be difficult unless extra ambulance resources are provided.

### **The economic and efficient use of resources (Part 3)**

**18** An ambulance provider needs to ensure that they are responding efficiently to need for their service and controlling cost. In Part 3 of this report we review the costs of the emergency ambulance service, including comparisons with other services in Britain, and examine how far the Service make the best use of available resources in areas such as vehicle deployment and managing crew time.

### **The Service have controlled core resource costs**

**19** Although total resources for emergency ambulance work have increased by 18 per cent in real terms since 1994-95, including significant investment in infrastructure such as new radio systems, activity and productivity have also increased. The net result is that the average cost of each emergency and urgent response that the Service make has increased by only two per cent in real terms in the same period. The Service's average cost for each such response is similar to or lower than that of other ambulance services in Britain taking into account differences in population density. The Service's management costs are lower than other ambulance services in England incur, while the Service have introduced employment terms for crews which encourage flexible working and are competitive. The Service have market tested key business areas.

### **There is potential to improve the efficient management of available emergency ambulance resources**

**20** The operational efficiency of an emergency ambulance service is concerned with two main issues: arranging ambulance resources to best match varying and difficult to predict demand levels; and ensuring that each ambulance minimises the time taken to deal with each incident.

**21** There is scope for more systematic review of ambulance crew shift rosters and vehicle deployment at station level in order to achieve a more effective balance between responding to demand and keeping within available resources. Some ambulance stations appear better resourced than others relative to demand, and vehicles at some stations spend a high proportion of time working away from their normal area. These are matters that the Service should keep under regular review. However stations with most ambulances compared to demand do not necessarily have the shortest average response times. So while it is important to keep the balance between ambulance resources and demand under regular review to ensure economy and cost effectiveness, doing so will not necessarily help the Service improve response times greatly unless they operate efficiently in other areas too.

**22** In aiming to maintain and improve response times the Service must minimise the whole time to deal with each 999 and doctors' urgent incident from start to finish – the incident service time. (This is different to the response time, which measures only the time taken from the initial call to an ambulance arriving at an incident.) The more quickly ambulances can reach patients and respond to and satisfy patients' needs, the sooner each crew is available for further work. Especially at the busiest stations, where managers often task crews with the next

job as soon as they complete the previous one, reducing the time taken to deal with each call means each crew can deal with more cases in each shift. Consequently, there will also be fewer times when a 999 response is delayed because no ambulance is immediately available.

**23** In aiming to reduce service time, for example by reducing the time crews take to hand over patients in a busy hospital emergency department, the Service need to ensure that they will not compromise patient care. The Service have already taken initiatives to improve service time including the use of new technology to enhance control of crew and vehicle resources. But they recognise that a more systematic approach and improved information may help them to manage incident time and other aspects of their operations more efficiently.

## **Providing effective pre-hospital emergency care (Part 4)**

**24** In Part 4 of this report we examine how the emergency ambulance service can best ensure that they meet the clinical needs of patients for whom they care.

**25** The Service are far more than an emergency transport provider. In emergency cases they often provide the first link in the NHS's chain of patient care. Ambulance crews can save lives or provide early care with very significant clinical benefits for the patient, and they can help to avoid or reduce the need for subsequent more complex treatments in hospital or elsewhere, to the benefit of both patients and the NHS.

### **The Service need to strengthen their clinical direction and development**

**26** The main procedures that the Service operate to ensure effective pre-hospital emergency care include professional clinical leadership and decision making, mandatory professional training and qualification of frontline crews and written clinical protocols. These are important means to ensure that the Service achieve satisfactory standards of patient care. But there are some shortcomings in other areas that suggest that stronger leadership is needed to increase the confidence about the clinical care that the Service provide.

**27** Important components of ambulance clinical care are targeting care towards areas that provide the greatest benefit to patients, and providing healthcare which is in line with professionally recognised standards and which results in measurable benefits for patients. The Service need to establish clearer



objectives and priorities in these areas. Also the Service could do more to learn from good practice in monitoring clinical quality and there is scope to improve the availability and use of clinical information to support effective patient care.

**28** As a newly established Special Health Board, the Service are now completing their first Health Improvement Programme. This is an opportunity to improve their direction of clinical matters and to set clearer objectives and priorities concerning health gain, based on assessment of clinical need. It will also provide a means to assist necessary consultation with patients and the rest of the NHS.

### **Crew quality of service appears good**

**29** Our research amongst patients and NHS staff shows that they are mostly very satisfied with the quality of service that emergency ambulance crews give. While praising crew skills and care, NHS staff see scope to develop aspects of the emergency ambulance service, to improve the quality of care provided. Opportunities to improve quality of service include minimising pre-hospital time, partnership working and a customer oriented approach, and improving knowledge about the Service's clinical impact. NHS staff also emphasised the need for the Service to improve clinical audit and monitoring clinical quality.

## **Opportunities for service improvement**

**30** Our main recommendations for the Service and the Scottish Executive Health Department resulting from our value for money examination of the Service are set out below. The Service should take the lead in involving their health partners in necessary decisions regarding the ambulance service. Health partners include other Health Boards, primary and secondary care providers and patient groups.

*The Service should improve how they address the clinical and health issues underlying their work*

---

**1a)** The NHS seek to improve the quality of patient care provided at all levels. The Scottish Ambulance Service save lives and provide other clinical benefits for patients but it is not clear that they are directing their work to have the greatest possible impact. To help them to do so we recommend that the Service should now address the following clinical development priorities:

- Consult with health service partners and clarify and agree reasonable expectations governing the Service's role and contribution to pre-hospital emergency care.

- Organise improvements in clinical information about ambulance patients, and provide initial care needs assessment/base line planning data.
- Prioritise the most important health needs of ambulance patients, and how the Service can have the most beneficial impact on these needs.
- Build on the foundation of the Service's existing clinical protocols so that they continue to evolve and promote clinically effective pre-hospital emergency care procedures. For example, review the protocols to assess the need for increasing their evidence base.
- Develop clinical audit and clinical quality monitoring, and provide assurance that emergency crews are doing a good job.

**1b)** To equip better the Service to meet the Government's goal for high quality care and effective clinical practice the Service and the Scottish Executive should increase external representation on the Service's clinical governance committee and/or Board. The Service already receives advice on clinical matters from other health professionals such as the national professional advisory group and local paramedic steering committees but there is a need to improve external representation further. In particular, other Health Board experiences in areas such as needs assessment, partnership working and use of health information could help the Service to develop and implement an effective health improvement programme, and otherwise foster their new role as a Special Health Board.

**1c)** The full impact of the Service's work can only be demonstrated by tracking the complete patient care pathway. For example access to hospital patient care and outcome information is required to measure cardiac arrest successes and other ambulance healthcare outcomes. In developing their clinical role the Service should therefore continue to promote and extend partnership working with other health care providers in primary and secondary care.

*The Service and the Scottish Executive should act urgently to consider whether and how far to introduce ambulance deployment systems which give greater priority to life threatening emergencies*

---

**2a)** The Service are not achieving all response time targets, and against these there are serious problems in Glasgow and room for improvement in other urban and rural parts of Scotland. However, while faster ambulance responses to the most seriously ill patients are likely to produce health gains including more lives saved, they would not be so beneficial for a third of patients who have only minor or no injury.

**2b)** Compared to the existing system of ambulances responding to patients more or less on a first come, first served basis, dispatching ambulances according to each call's clinical priority offers the prospect of efficiency in resource use combined with improving health gain and ultimately of saving more lives. The Service have been considering the option of a new deployment system based on priority for several years, and resolving this issue now is an important factor in determining their further development. It is only realistic to set longer-term goals for improving ambulance response times as we recommend below by first deciding the basis by which ambulances are to be deployed.

**2c)** Implementing a new ambulance deployment system based on priority will present complex challenges and new costs. The main issues to resolve include:

- What specific benefits priority dispatch is likely to secure, quantified in terms of both improvements in response times to more seriously ill patients and measurable improvements in health outcomes.
- What, if any, additional resources are required to secure these improvements, and whether they are commensurate with the benefits obtained.
- The potential risks and costs of not moving towards a system of priority dispatch.
- How best to categorise the seriousness of incidents under priority dispatch, and response time targets for each level of categorisation.
- For 999 calls which may be categorised as low priority for an emergency response, the other health care options available and how members of the public may best access these. How to address any concerns the public may have on this aspect.

- How to manage the risk of “under prioritisation”, when based on the information received, control centre staff would assess a patient’s condition to be less serious than it really is.
- The need for publicity and information on the reasons for priority dispatch and the health care options available when a caller dials 999.

**2d)** In framing proposals for any change, the Service should consult with their health care partners.

*In other ways the Service should target improved responsiveness to provide the greatest benefit and impact*

---

**3a)** In order to maximise their impact the Service should set goals and targets that correspond to real and specific health needs that they should aim to satisfy through improved responsiveness. They should do so as part of the process of developing and implementing a health improvement programme now required of them as a Special Health Board, and to inform goals and targets the Service should obtain wider NHS and patients’ views.

**3b)** In Glasgow slow response times coincide with a large population that has a poor health record<sup>2</sup>. Issues where the Service can contribute to health gain in Glasgow include heart disease, strokes and dealing with the consequences of mental health emergencies such as suicide and drug overdose. The Service should work with Greater Glasgow Health Board to assess the specific health risks of not meeting existing ambulance response targets in Glasgow. The Service should set specific targets for improved response times linked to these needs, and taking account of their decision whether to implement a new ambulance deployment system based on priority.

**3c)** In more remote areas of Scotland where ambulance response times are unavoidably long, the Service should develop further alternative approaches which place emphasis on greater collaboration with other local health care providers and community support. By building on existing collaborative work the Services’ aim should be to secure with other providers an emergency care service which best meets the immediate care needs of rural populations.

<sup>2</sup> For example, see the Annual reports of the Director of Public Health for Greater Glasgow Health Board 1994-95 to 1996-97 and 1998.

**3d)** The recent Arbuthnott report anticipates changes in the distribution of NHS resources across Scotland to achieve greater equity and to reflect better variations in health needs<sup>3</sup>. There are substantial differences in the resources available to the emergency ambulance service in different parts of Scotland<sup>4</sup>. Accordingly, with other Health Boards, the Service should aim to allocate their resources so as to achieve most health gain overall.

*The Service should improve the planning and deployment of operational ambulance resources.*

---

**4a)** There is potential to improve the management of available resources to provide better Service responsiveness. The Service should review existing practice regarding the disposition and deployment of emergency ambulances. They should confirm what is best practice, and identify where gaps against best practice occur and priority areas to implement changes. Specific opportunities which offer potential for the Service to consider a more systematic approach include:

- Review and reconfigure as required establishment and shift patterns at stations where many ambulances work outside their normal areas of operation.
- Use specialised operational research techniques already available in the Service to review resources and deployment at individual locations on a more frequent, systematic and deliberate basis.
- Set targets and monitor positively all aspects of incident service time, so as to promote overall productivity.
- Improve exception reporting and analysis when long response times occur, and act to resolve any problems highlighted.

**4b)** The Service should undertake as soon as possible a fundamental review of the existing eight separate control centres to establish whether improvements in effectiveness and economies in provision through reduced numbers could be achieved. Control centres are the first points of contact between the Service and those who need emergency medical help, yet there is little or no evidence that eight separate centres foster the most economic, efficient or effective service. Control centres will have an increased role to play if the Service develop towards

3 *Fair Shares For All* Report of the National Review of Resource Allocation for the NHS in Scotland, chaired by Professor Sir John Arbuthnott, the Scottish Executive Health Department, July 1999

4 See Part 3 of this Report

implementing some degree of priority dispatch, and may face other challenges from wider NHS initiatives such as NHS Direct<sup>5</sup>. We note that the Service are committed to review the number, role and purpose of their control centres by March 2000.

*The Service and the Scottish Executive should set and monitor new performance measures to focus the development of the Service, including resource efficiency and healthcare impact*

---

**5a)** As part of our work we co-operated with the Service to explore the scope for enhanced performance measures. We have already reported directly to the Service our conclusions that there are some important potential gaps in the coverage that the Service's performance measures presently provide. The Service should implement enhanced performance measures, to help the overall direction of the Service and to improve management of resources and accountability.

**5b)** As a newly established Special Health Board from April 1999, the Service's Health Improvement Programme and corporate contract with the Scottish Executive Department of Health provide the basis for new and better performance measures, including measures of health outcome.

**5c)** We recommend that, in developing and agreeing new performance measures, the Scottish Executive and the Service aim to:

- Select measures indicating the contribution the Service makes to healthcare improvement as well as responsiveness and resource efficiency.
- Look at new targets for (i) response times to seriously ill patients and (ii) total pre-hospital time.
- Improve measures in the area of vehicle and crew deployment.

5 The Government announced details of NHS Direct Scotland in March 1999. In brief it is a two-year £2.5 million investment in primary care to pilot the expansion of existing general practitioner out-of-hours services to include 24-hour access for patients to health advice from trained nurses. The pilot arrangements aim to encourage Primary Care Trusts and general practitioner co-operatives to explore the potential for nurse provided advice/triaging including 24 hour telephone advice lines. These would help patients who have worries about their health but which may not be serious enough for a GP visit. The pilot also aims to foster better links between general practitioner out-of-hours services, out-of-hours social work services, and hospital accident and emergency services. Once developed the new services may also provide a better response to 999 callers who do not require the immediate dispatch of an ambulance.

- Improve measures in the area of crew productivity, including incident service time.
  - Improve measures in the area of control room performance.
-