

The Met.Office



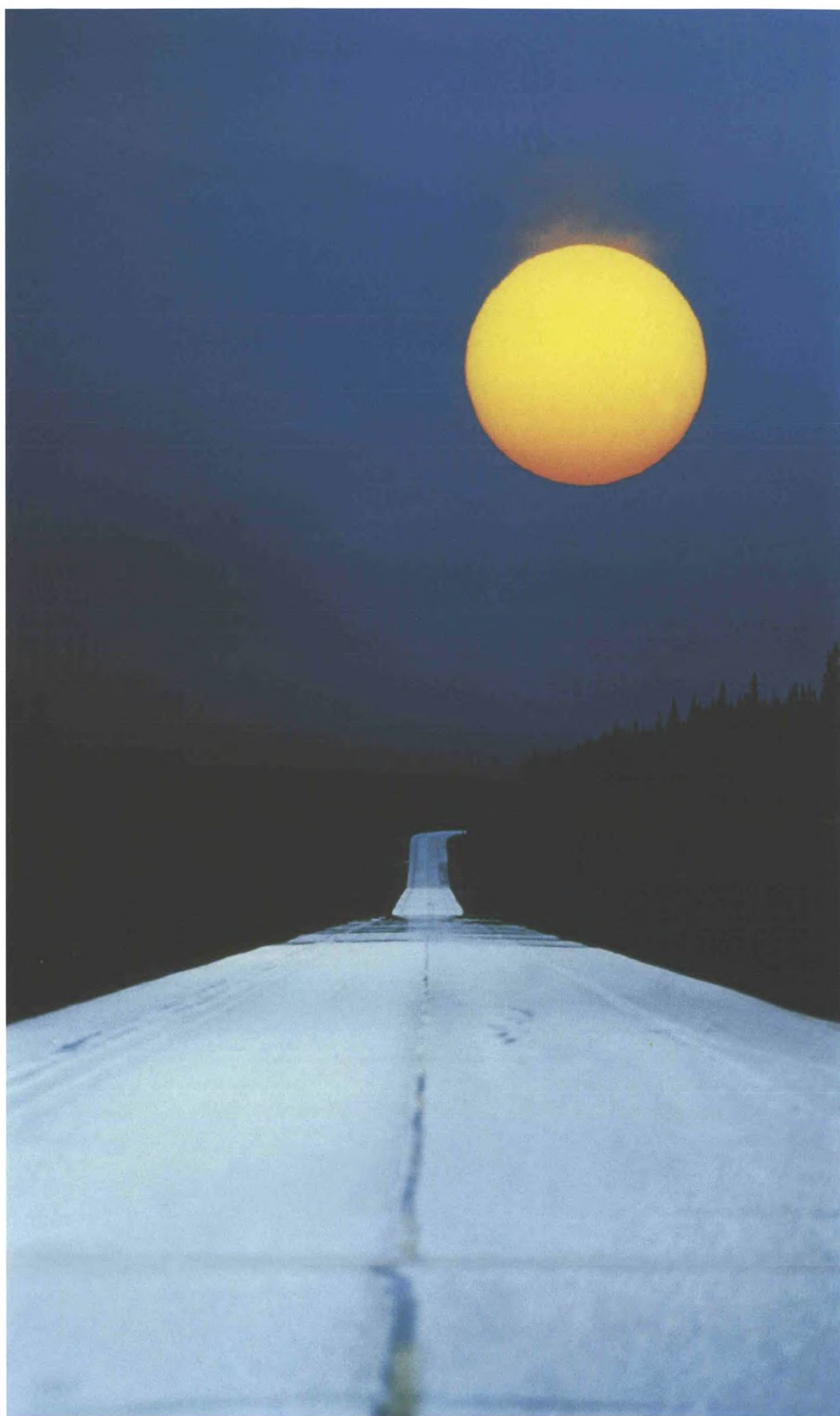
The Met.Office

An Executive Agency of the
Ministry of Defence

Annual Report and Accounts 1995/96

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Exchequer and Audit Departments Act 1921*

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The Met. Office Charter

Our purpose is to excel in providing meteorological services that satisfy our customers' current and future requirements.

To fulfil this purpose, we commit ourselves to:

- serving our customers – the United Kingdom government, the public, the defence forces and our aviation, maritime and commercial customers – by meeting their agreed current and future requirements for meteorological, climatological and environmental services, forecasts, information and advice in a cost-effective manner;
- serving the community and the United Kingdom economy by increasing the benefits of our services to as wide a range of users as possible;
- helping our customers to get maximum benefit from our information, advice and services;
- providing customer services through the application of science, to a high standard of business practice and in a competitive manner;
- maintaining an integrated national meteorological service for the United Kingdom;
- continually striving to improve our forecasts, particularly their accuracy;
- using modern, well-proven technologies in our operations;
- aiming for excellence in the advancement of the science of meteorology;
- playing a leading role in the development of meteorological science and operations through national, European and international collaboration.

To do this, we must:

- secure appropriate resources and use them cost-effectively;
- honour our commitments, both inside as well as outside our organization;
- set high professional standards for ourselves and continually strive to improve our performance;
- practise openness and supportive leadership at all levels in our organization;
- give greater individual responsibility to all staff by delegating authority together with the means to exercise it;
- provide an environment that helps staff to perform well and achieve satisfaction and fulfilment in their jobs;
- manage the effective recruitment and placement of staff, provide appropriate training and encourage the development of all staff;
- have an outward-looking view, desiring to seek, accept and act on advice from both within and outside The Met. Office.

About The Met. Office

The Met. Office, formal title the Meteorological Office, was formed in 1854 as a small department within the Board of Trade to provide meteorological and sea current information to mariners. Since then the organization has steadily developed in response to new demands for weather services, the most important of these being aviation. This led to The Met. Office being taken under the wing of the Air Ministry just after the First World War and ultimately moving into the Ministry of Defence.

The modern era of weather forecasting arrived in 1962 when we installed an electronic computer at our, then, new HQ in Bracknell. In 1964, the first operational cloud pictures from satellites became available. Developments in both numerical prediction techniques and satellite meteorology, based mainly on research carried out within The Met. Office, transformed the science and continue to do so.

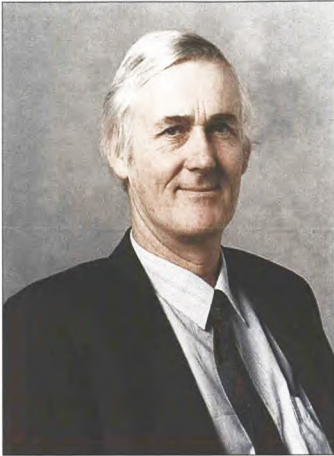
We installed our first supercomputer in 1981, the CDL Cyber 205; soon after, we introduced our 10-level atmospheric computer model. We replaced the Cyber with a Cray Y-MP machine in 1990, allowing the introduction of a new 19-level model with significantly improved representation of atmospheric processes. A second Cray Y-MP was installed in 1991 to support the climate research programme carried out at the Hadley Centre, jointly funded by The Met. Office and the Department of the Environment (DoE). We replaced both machines by a single Cray C90 in May 1994 with a resultant sixfold increase in the speed of processing. Later this year, we shall replace the Cray C90 with a Cray T3E that is five times more powerful still.

These scientific and technical developments underpin the work of The Met. Office; they allow us to constantly improve the accuracy of our forecasts and, more importantly, the quality of the services that we deliver to our customers.

The Met. Office became an MoD Executive Agency in April 1990. On 1 April 1996, The Met. Office became a Trading Fund, the latest step in our development. As highlighted in our Framework Document, The Met. Office continues as an international centre of excellence for the development of the science of meteorology and the provision of weather-related services.



The Met. Office Headquarters at Bracknell



Chief Executive's Foreword

Introduction

This is our last Report as a Vote-funded 'Next Steps' Agency; 1995/96 marked our transition to a Trading Fund on 1 April 1996. The Report is designed for a wide readership: Members of Parliament; our Ministry of Defence (MoD) owners; our customers, including the general public; and our own staff.

I very much appreciate the loyalty and commitment shown by my staff during this successful and exceptionally busy year. I am sure they realize that changes, though sometimes painful, are necessary in order for The Met. Office to flourish. Indeed we all recognize that the move to Trading Fund is no more than another stage in our 142-year history of excelling in the provision of meteorological services.

During the year, we adopted two clear aims; to deliver the year's programme as described in the Business Plan, and to focus our planning on producing new Corporate and Business Plans that clearly defined our strategies for the future. We used these documents to show the Treasury and Ministers that The Met. Office would be viable as a Trading Fund. We demonstrated once again our growing scientific and technical prowess and the commitment of our staff to the delivery of excellent services to our customers. We met the majority of our seven key targets (see page 7) whilst making some important changes to the way we run our business.

Getting in shape for the future

As part of the review of strategy, we examined the business organization. We created a new Services & Business Directorate, to concentrate on the business needs and service provision for our principal customer groupings. We also reviewed our business and financial structures and our reporting systems, and started developing a more sophisticated management information system better to meet our needs as a Trading Fund.

The need for the improvement and measurement of performance, and their publication, has always been a notable feature of meteorological services. As far back as 1913, it was possible to compare the timing of forecasts issued to the navies of Europe! Since we became an Agency in 1990, we have reported statistics for an increasing range of our activities and services. Nevertheless, in an investigation of The Met. Office, the National Audit Office (NAO) found that there were shortcomings in the way that we targeted, measured and reported our performance; that said, they noted that it was not always possible to meet demanding targets. The Public Accounts Committee (PAC) endorsed these conclusions, while commenting favourably on the considerable international reputation of The Met. Office. After publication of their report, we introduced systems to enable us to review and track many aspects of our performance on a monthly basis, allowing us to keep right on top of service delivery. This year, for the first time, our performance against these key targets has been validated by the Comptroller and Auditor General.

Part of our strategy to create more-effective management has been to reduce the number of managers, thus increasing the focus on specific technical and service activities. This reorganization started at the top with a restructuring of the Management Board. At Board level, Peter Ryder retired from The Met. Office and we also lost Mike Nicholls, Roger Wiley and Peter White. I wish them well in their retirement or new careers. At the same time, I welcome on to the Management Board Jim Caughey (Director of Observations), Colin Flood (Director of Operational Services) and two Directors who have joined the Office from the private sector, Simon Cross (Director of Services & Business, the integrated division for the provision of all customer services) and David Roberts (Director of Corporate Development).

During this year, we acknowledged the need for more-rapid and face-to-face communication with staff by introducing Team Briefing. Senior managers also carried out a nationwide tour of our operational facilities to inform staff of the key elements of our change to a Trading Fund. Both initiatives have helped staff prepare for the new environment.

INTRODUCTION

Highlights of the year

As every year, special features of the weather tested our forecasting ability. According to our historical climate records for Central England Temperature, much of the UK experienced the hottest August since the 17th century. Our numerical model provided forecasters with reliable predictions during the summer and accurately forecast the end of the hot, dry spell. At the other end of the temperature spectrum, in the winter of 1995/96, the Central Forecasting Office and our outstations dealt with many occasions of heavy snows and storms. This allowed the accurate and timely issue of severe weather warnings to the public and armed forces. The winter was particularly severe in the Balkans where the Mobile Met. Unit (MMU) was operating. MMU staff provided guidance first to the United Nations forces and latterly to the ACE Rapid Reaction Corps as part of the Implementation Force (IFOR). IFOR commended the MMU for their forecasts in difficult circumstances.

During the year, our research staff further raised the high international standing of the unified Numerical Weather Prediction model (UM) by introducing improvements that resulted in a significant increase in accuracy. The world-leading work at the Hadley Centre on the climate version of the UM was the basis for most of the recent conclusions of the Intergovernmental Panel on Climate Change about the likely effects on climate change of artificially generated greenhouse gases and aerosols. After a meeting in Berlin of the Framework Convention on Climate Change, at ministerial level, the Secretary of State for the Environment commended the work of the Hadley Centre in Parliament.

I presented the Chief Executive's excellence awards – always a pleasing task – to teams involved in this progress. These included staff focusing on forecasting research, satellite imagery, international presentations, and the application for MoD purposes of the UM for stratospheric forecasting.

After five years of gestation, the European Commission approved the Brussels-based ECOMET organization of the European national meteorological services (NMS) in August 1995. ECOMET's purpose is to enable customers in the European Economic Area to purchase meteorological services from any NMS while allowing them to share revenues arising from the sales. European NMSs also formed another meteorological network, EUMETNET, for co-ordinating improvements in the effectiveness of their larger-scale operations, for example in climate and observations programmes.

Every fourth year is always a special occasion for international collaboration when 176 countries attend the Congress of the World Meteorological Organization (WMO). On this occasion, it coincided with the 50th anniversary of the United Nations of which the WMO is a specialized agency.

Congress created a new international agreement for reorganizing and increasing the exchange of meteorological data, the UK and other European countries working closely together. The agreement strengthens the role of NMSs while allowing for the growth of national and international commercial services.

Looking ahead

In the new Corporate and Business Plans we produced this year, we emphasized that The Met. Office will concentrate on its core business of providing a world-class, science-based meteorological service that meets the needs of its customers. This is in line with the PAC conclusions and the Government's response to its findings. We have begun to monitor the accuracy of our Numerical Weather Prediction model by introducing a performance index – see page 9. We have used a combination of internationally exchanged performance measures that allows us to compare our forecast accuracy with that of other centres and to track our relative performance year on year.

We expect that our participation in EUMETNET initiatives will help to reduce duplication of effort between European NMSs and to ensure fair cost-sharing for common facilities thus helping to increase our efficiency for the benefit of all our customers.

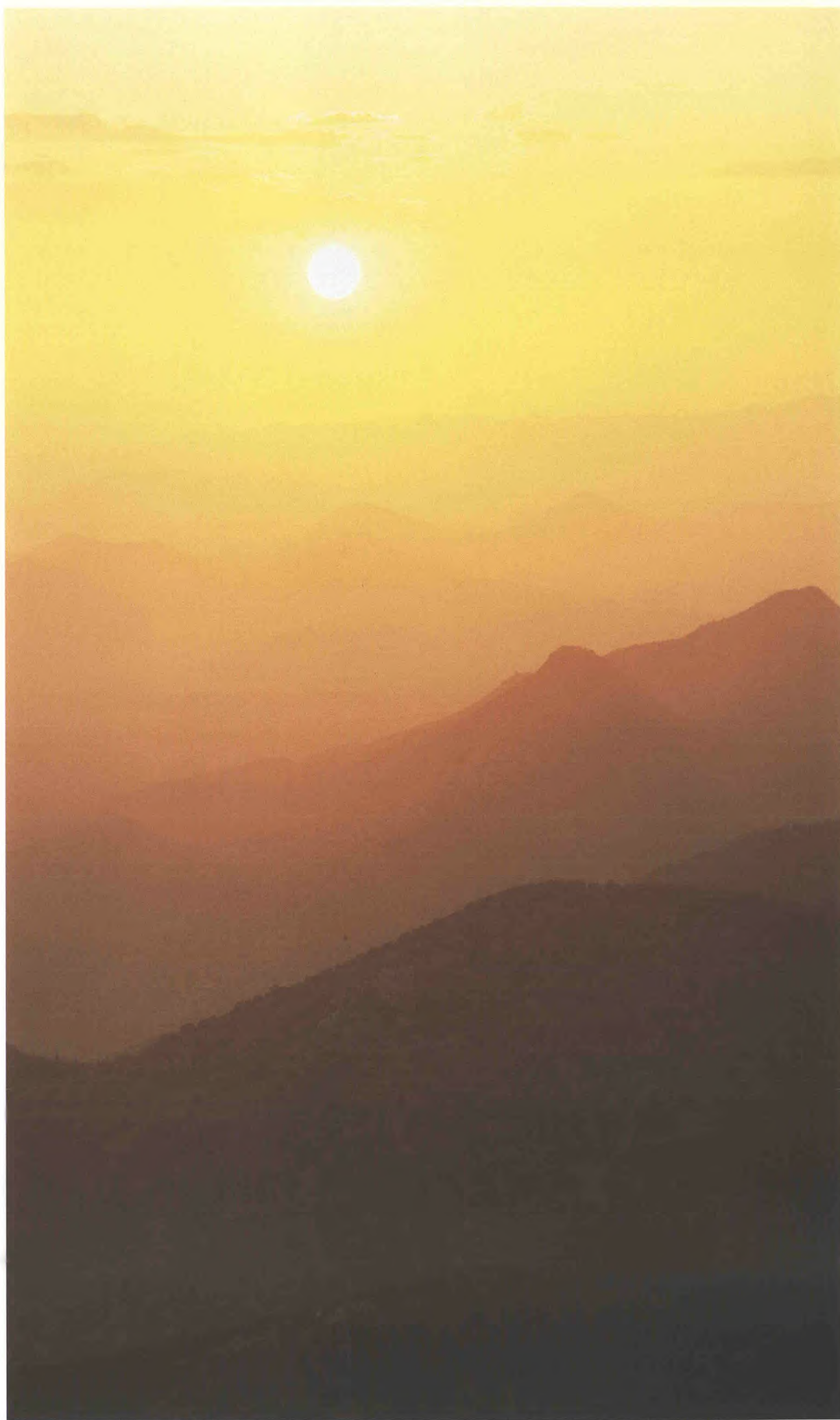
Income from Commercial Services will continue to be important. There is no cross subsidy of commercial activities by other areas of The Met. Office and to maintain this position we must concentrate on higher margin business. We will focus increasingly on delivering quality services to customers at an acceptable financial return. To this end, we are expanding our customer education programme to enable customers to assess the value and benefit of receiving meteorological services. On the international commercial front, we see real benefits in supporting the ECOMET organization.

With these and other strategies set out in our Plans, we expect to be able to meet the challenges of the 21st century. Improvements in forecasting accuracy, and increased collaboration and partnership with other NMSs and the private sector will put us in the best position to deliver value-for-money services to all our Trading Fund customers.



JCR Hunt
Chief Executive
10 October 1996

PERFORMANCE



PERFORMANCE

Performance against key targets 1995/96

The seven key targets for the Agency in 1995/96 are shown below. Targets introduced for the first time are identified in bold type.

To achieve Trading Fund status on 1 April 1996.

Achieved.

QUALITY

To achieve at least 80% of the Business Plan external targets for customer satisfaction, forecast accuracy and timeliness.

This was not achieved; of the 16 targets, only 14 had sufficient information to be verified by independent audit. Of these 14, eight were achieved.

To attain an average accuracy over the UK of at least 84.0% for the 24-hour national weather forecasts broadcast at 1755 by BBC Radio 4.

Achieved. We attained an average score of 84.5% this year.

RESOURCES

To deliver the agreed programme within the Business Plan cash limit of £78.3 million (at 1994/95 prices using the MoD uplift figure as the deflator).

Achieved. The target cash limit equates to £80.5 million at 1995/96 prices; we delivered the programme at a cash expenditure of £78.8 million (see Note 18, page 40).

To reduce net expenditure, as shown in the Annual Report and Accounts, to £90.3 million, representing a decrease of 2.6% on the 1994/95 budget (both at 1994/95 prices using the MoD uplift figure as the deflator).

Achieved. The target figure for net expenditure equates to £92.8 million at 1995/96 prices; our net expenditure for the year was £91.3 million, before exceptional items.

To provide a net contribution to Core and general overheads of £3.8 million from Commercial Services (excluding CAA and DoE).

This was not achieved. The target figure for net contribution from Commercial Services equates to £3.9 million at 1995/96 prices; we achieved a contribution of £3.5 million.

EFFICIENCY

To increase efficiency in individual business areas as given in the targets for each area of The Met. Office mainly through improvements in quality and volume of services and reduced unit output costs.

This was not achieved; three business areas did not achieve their efficiency targets.

The Comptroller and Auditor General has examined this statement of performance against key targets and he is satisfied that the performance achieved is fairly stated.

Future plans and targets 1996/97

The key targets set for The Met. Office will be the principal means of measuring the performance of the organization. The Met. Office is committed to continuing the independent validation of performance against key targets. We are continuing to discuss with HM Treasury and the National Audit Office how our performance targets might best be set and assessed.

Hansard, 8 May 1996

Mr Duncan Smith:

To ask the Secretary of State for Defence what key performance targets have been set for the Meteorological Office agency for the financial year 1996–97.

Mr Arbuthnot (Minister of State for Defence Procurement):

The Meteorological Office has been set a range of quality, financial and efficiency targets to ensure that it delivers progressive improvements in the provision of weather-related services in 1996–97.

The key quality target set for the Meteorological Office during financial year 1996–97 is to achieve 80 per cent of the designated business plan external targets for customer satisfaction, forecast accuracy and timeliness. Additionally the agency is to devise a value for money index to measure the quality of its services. The accuracy of the agency’s numerical weather prediction model is to be improved by at least 2 per cent in 1996–97, as measured by an index of internationally exchanged model performance data.

The Meteorological Office was established as a trading fund on 1 April 1996 with a financial target to achieve an overall return of capital employed of at least 7 per cent. A target of £3.3 million has been set for the net contribution to the agency’s core costs and central overheads from the provision of commercial services to the public, industry and commerce, excluding the Civil Aviation Authority and the Department of the Environment.

The 1996–97 efficiency target is to meet the key quality target within gross expenditure, before interest charges, of £140.3 million. For future efficiency targets the agency is to develop an auditable efficiency index.

Numerical Weather Prediction
Performance Index

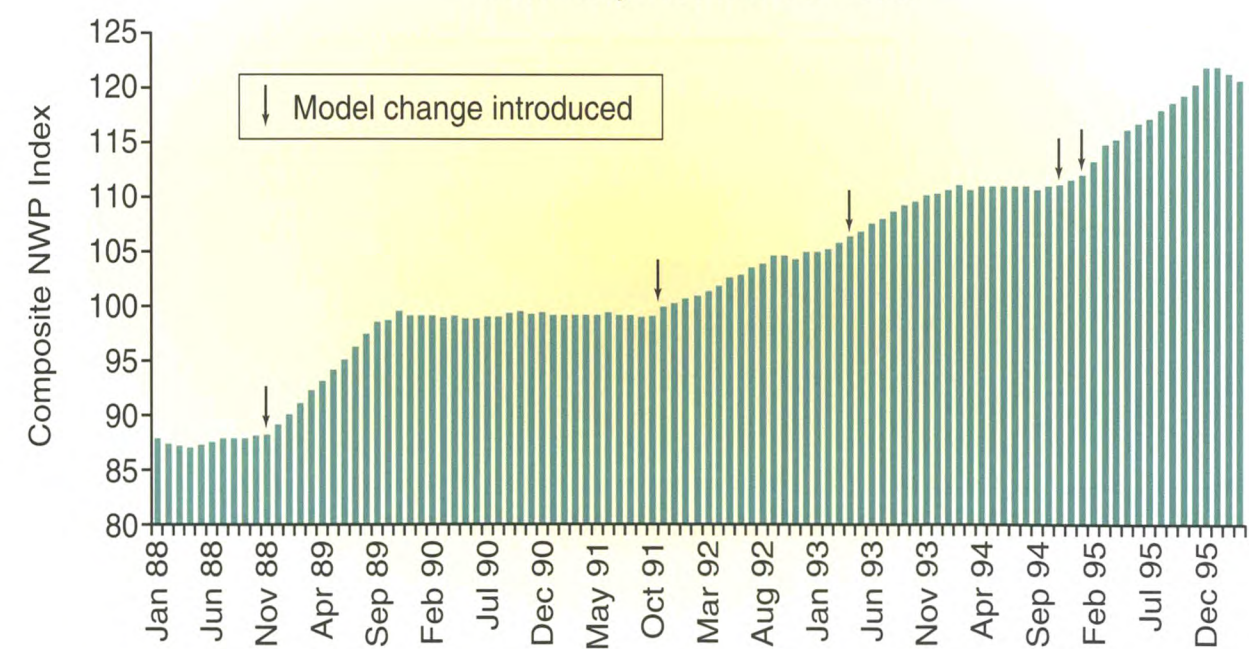
The Met. Office monitors and reports the accuracy of its Numerical Weather Prediction (NWP) model by means of an index that reflects the overall accuracy of the model rather than single elements.

We have created an index from verification statistics for the Unified Model, calculated according to World Meteorological Organization standards. The constituents of the index are measures of the size of forecast errors. We calculate these routinely for several measures of the weather such as wind and pressure, for forecast lengths ranging from one to five days, and for different areas of the globe.

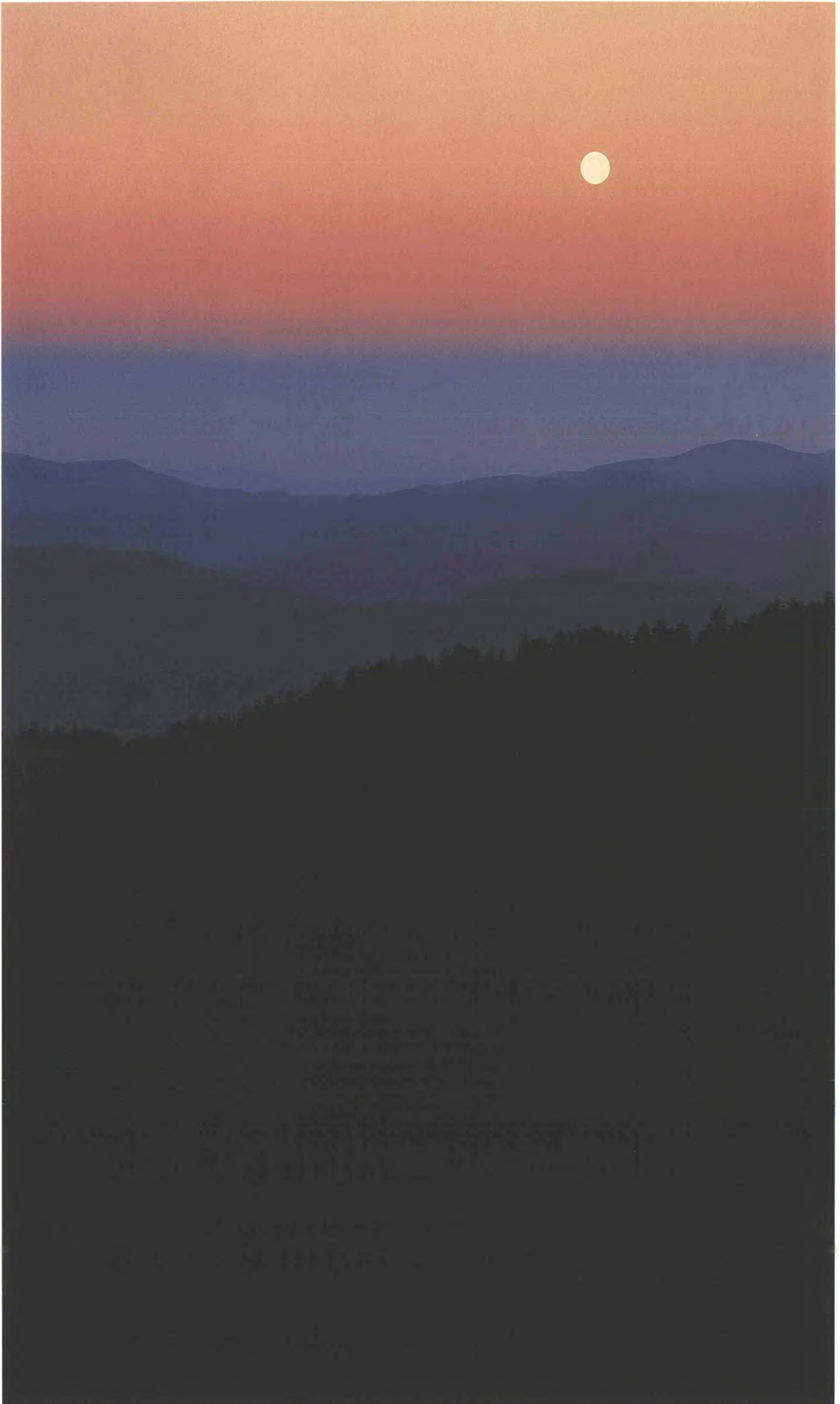
We combine these statistics using weightings appropriate to their importance to our customers and produce a mean figure for twelve months. We have defined the figure for the year ending December 1991 as the standard NWP Performance Index value of 100. By relating actual statistical values with the standard value, we can produce the Index for any particular twelve-month period.

The results of calculating the Index values back to 1988 are presented below. There are a number of significant 'step' improvements in performance, each directly linked to improvements made to the NWP model.

Composite NWP Performance Index for The Met. Office Global Model.
Twelve-month running mean values
for January 1988 to March 1996.



CORPORATE ACTIVITIES



Management structure

The Met. Office Board

The Management Board of The Met. Office is responsible for the day-to-day running of the Agency's operations and for ensuring that customers' requirements are met.

Simon Cross joined the Board as Director of Services & Business on 6 October 1995. Colin Flood, Director of Operational Services, Jim Caughey, Director of Observations, and David Roberts, who took on a new position of Director of Corporate Development, joined the Board with effect from 1 March 1996.

Membership of the Management Board at 1 April 1996 is shown below.



Prof Julian Hunt FRS,
Chief Executive

Paul Mason FRS,
Chief Scientist

Martyn Bittleston,
Director of Finance &
Administration



David Roberts,
Director of Corporate Development



Jim Caughey,
Director of Observations



Colin Flood,
Director of Operational Services



Simon Cross,
Director of Services & Business

The Defence Meteorological Board

The Secretary of State for Defence, as owner of the Agency, is advised by the Defence Meteorological Board. The Board comprises members with relevant scientific and commercial experience, and normally meets four times a year.

The membership of the Board at 1 June 1996 was:

Chairman

Sir JM Stewart KCB, Second Permanent Under Secretary, MoD

MoD members

- Prof Sir David Davies CBE FRS, Chief Scientific Adviser
- Lt Gen AGH Harley, Deputy Chief of the Defence Staff (Commitments)
- Mr JF Howe CB OBE, Deputy Under Secretary of State (Civilian Management)
- Prof JCR Hunt FRS, Chief Executive, The Met. Office

External members – appointed by the Secretary of State

- Prof BEF Fender CMG, Chief Executive, Higher Education Funding Council for England
- Mr CM Brendish, Admiral PLC

The Meteorological Committee

The Met. Office Chief Executive is advised by the Meteorological Committee on broad aspects of Office policy. The committee also reviews aspects of The Met. Office programme and activities with particular emphasis on meeting customer needs.

Members are appointed by the Under Secretary of State (Defence Procurement) for a period of four years. The Committee meets twice a year.

Membership of the Committee at 1 April 1996 was:

Full members

- Baroness Platt of Writtle CBE DL
- Mr D Filkin
- Mr DA Davis
- Baroness Jay of Paddington
- Prof MH Pesaran
- Prof BJ Hoskins FRS
- Prof RL Bell CB
- Ms A Gammidge
- Dr H Hughes OBE
- Mr CM Stuart OBE

Ex officio members

- Prof JCR Hunt FRS, Chief Executive, The Met. Office
- Cdre RMV Willis, RN, DNOM
- Dr D Bennetts, MoD Meteorological Support Group
- Mr G Paulson, Director of International Affairs, National Air Traffic Services, CAA

Human resources

This year, we have introduced significant changes to pay and grading arrangements and to the management structure of The Met. Office. Staff numbers have dropped significantly and a new management training programme started.

We planned and made these changes to ensure that The Met. Office enters the Trading Fund era with effective human resource systems in place. We are confident that the open performance management scheme, introduced in 1993, is working well. We introduced the scheme to ensure that staff have a clear understanding of targets and standards, something that will be even more vital in the years ahead.

Pay and grading arrangements

In July 1995, we reached agreement with the Trades Unions on a major change in pay and grading arrangements and introduced the new scheme on 1 November 1995. We have moved from five separate pay agreements to a single agreement, and from a multitude of grades to a scheme of 15 Job Value Bands. Also, by dropping the concept of industrial staff, we have reduced from two sets of Terms and Conditions of Service to a single set. A separate initiative has reduced the layers of management so that no one is more than four steps from Director level.

There were two objectives for these changes, with advantages to both management and staff. The first was to bring the pay bill under control while better targeting those who contribute to the effectiveness of The Met. Office; and the second to allow selection of the most suitable member of staff for a job without any artificial constraints of grade.

Simplified management structure and staff numbers

Changes to the management structure have taken place at all levels. During the year the number of posts at Director level was reduced from 12 to eight. The drive to reduce management levels, to improve efficiency, and further utilize computer-based systems, meant starting operations as a Trading Fund with 2138 staff – a drop of 185 in the past year. We achieved this planned reduction largely by natural turnover, reduced recruitment, retraining and redeployment, and voluntary early retirement.

Despite overall staff reductions, The Met. Office has recognized the need to invest in young talent for the future. During the year we recruited 41 graduate scientists and a further 25 or so will join us in Summer 1996.

Training in management skills

In September 1995 we started our first comprehensive management development programme using external suppliers to run training courses at The Met. Office College. This is a particularly cost-effective arrangement that allows the targeting of courses to our own requirements. We designed courses for all levels of management, particularly for staff taking on a management role for the first time. The content includes an awareness of diversity and equality of opportunity. Since September 1995, over 140 staff have completed courses, around 40% attending more than one.

Staff have reacted well to the programme, delegates commenting that the courses were valuable. We have revised the programme for 1996/97 based on a review of content and feedback. One of the improvements planned is the addition of a workshop where individuals can analyse the full range of their strengths and weaknesses. From this, they will be able to plan their development and identify learning opportunities that best meet their needs.

In further support of our commitment to improving efficiency and developing staff skills, we have continued the programme of courses on Project Management. To date some 300 staff have learned the principles of Project Management in a series of one- and two-day courses. A recent survey of reaction showed that staff felt they had received a good foundation for working to Project Management guidelines. We have reviewed this training programme for 1996 to encourage the development of a greater depth of knowledge and skills.



Delegates from the Introduction to Management course taking part in a team-building exercise.

Training in meteorology and its applications

The Met. Office runs its own College at Shinfield Park, Reading. The prime purpose of the College is to provide training that will help staff perform well, achieve satisfaction in their jobs and contribute to the achievement of our business objectives. To meet these aims we ran 106 courses at the College during 1995/96. In all there were 1800 student-weeks of meteorological training. About 15% of the training involved students from outside The Met. Office, mainly from other national meteorological services. This brought in a revenue of £244,000 which was a small increase over the previous year. We provided funding for some students as part of the international Voluntary Co-operation Programme (VCP), see **International** section on page 20.

Assessing and meeting future training needs

The College consults customer branches in setting the aims and objectives of the training courses on offer. Feedback from students also plays a vital role in the development of courses. Three months after the end of a course, students fill in a questionnaire. This focuses on whether the courses met their objectives and were relevant. In the last year the Customer Satisfaction Index reached 0.81, slightly exceeding our 0.80 target.

Training in weather forecasting

There has been a major change to the foundation training programme for new forecasters. During the year we created a restructured programme for the three phases of the training: Initial Forecasting Course (20 weeks), on-the-job training (26 weeks) and Advanced Forecasting Course (6 weeks). The new programme has a coherent set of objectives, agreed with customer branches, and came into effect from January 1996.

We have also reviewed the continuation training for forecasters. As a result, 24 staff attended two courses covering ocean-wave model interpretation and another 29 attended four courses dealing with global meteorology. The wave model courses involved collaboration with our Ocean Forecasting group while those on global meteorology used the expertise of instructors from the Royal Naval School of Meteorology and Oceanography. The new courses support the commercial provision of services, especially to the offshore industry and the media.

Health and safety, and technical training

The development of a health and safety training programme has continued. During 1995, we have put emphasis on training 40 staff in the 'high risk' category. At the same time, the College's School of Technical Training continued to provide specialist technical training to Met. Office staff and students from overseas.

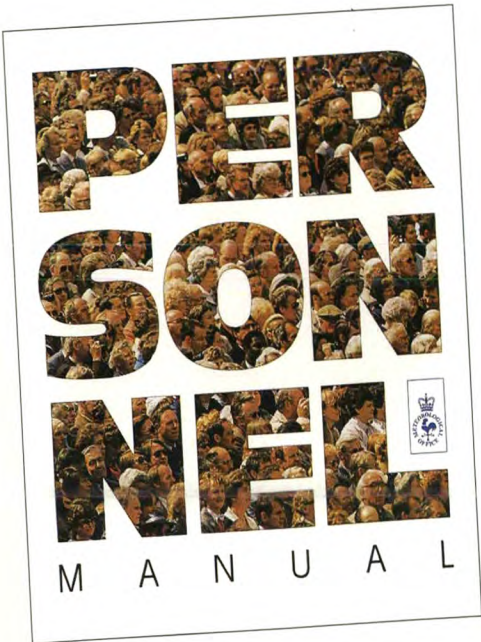
Equal Opportunities

During the year, we published The Met. Office Equal Opportunities policy. It stands as the first chapter of the *Personnel Manual*; we are writing all other chapters in the Manual in accordance with this policy.

We have improved wheelchair access between the Headquarters buildings and purchased equipment to help disabled staff do their jobs. We plan to apply for the disability symbol in 1996.

The 1996 Employee Attitude Survey included a section on Equal Opportunities for the first time. We will use the results to review the effectiveness of the Equal Opportunities policy and address any perceived problems.

At 31 March 1996, 18.6% of staff were female, 0.8% were from an ethnic minority background, 3.3% were disabled and 3.4% were employed part-time.



The latest version of the Personnel Manual is based around The Met. Office Equal Opportunities policy.

Finance

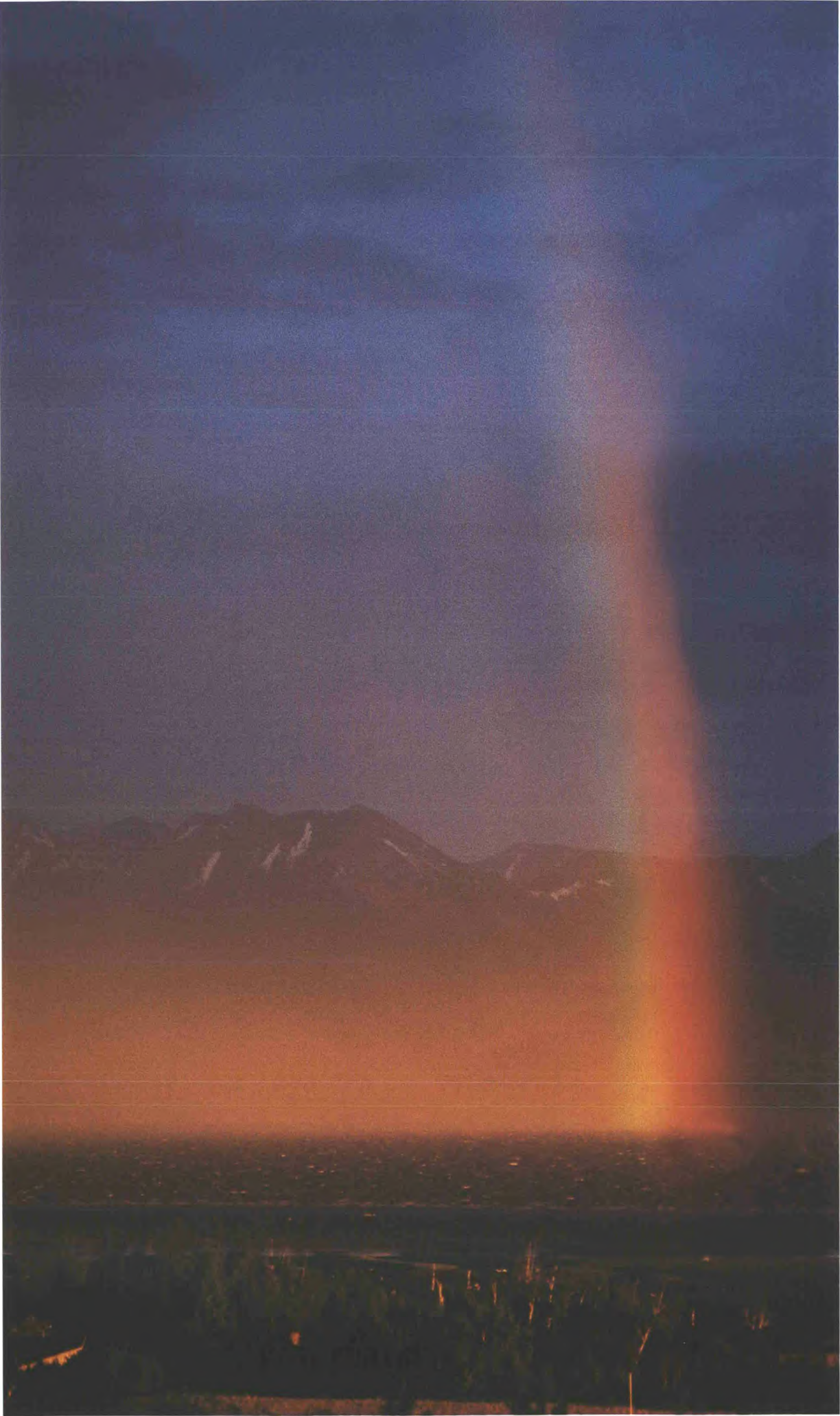
1995/96 was a year of high activity in preparation for the transition to Trading Fund. We introduced a number of additional tasks and changes to procedures whilst meeting the existing requirements of Agency and Vote accounting.

The main focus of the year was the successful move to a commercial accounting system on 1 April 1995 following a four-month development and implementation project. Where possible, we integrated the new system with existing Met. Office accounting systems in order to minimize changes. Having trained staff very quickly to operate the new accounting system, it was soon possible to produce reliable and timely information. Introduction of the new system meant that The Met. Office was in position to pay all its bills in a manner that matched commitments. We set up a system to generate new forms and invoices so that we could trade with MoD and subsequently, 'shadow' trading started. However, experience of working with the system during the first year revealed the need for more-comprehensive information and we have since put in place a project to develop the management information system.

Throughout the year, significant effort went into identifying the financial effects of the move to Trading Fund and developing financial analyses for the Corporate and Business Plan to show that The Met. Office would be commercially viable. Towards the end of the year we set up separate banking arrangements and VAT registration. By the year end, we had trained staff in these key areas and put in place procedures to carry out Treasury functions.

Whilst doing their day-to-day work, Finance staff have set up a number of new procedures required by Trading Fund including processing payroll and travel expenses, reconciling figures from the two accounting systems and verifying the fixed asset register. All in all, it has been a demanding but successful year.

BUSINESS AREA REPORTS



Observations

The Observations Division provides the Core service of defining the requirements for, planning and implementing all The Met. Office's observing networks.

Performance and efficiency

In December 1995, we reorganized the Division to separate the activity of supplying observations from the role of representing the needs of the various Met. Office customers, to enable us to focus more closely on meeting their requirements.

From a two-part study, we identified a number of cost-saving measures, with only minimum impact on service quality. We plan to introduce these during 1996/97.

Maintenance teams repaired more than 90% of faults on observing equipment within the agreed service restoration times. We achieved this target despite a major restructuring of the maintenance organization and a reduction of eleven staff. We also improved the systems for monitoring the performance of the weather radar network, exceeding the target for the availability of radar data.

Marine matters

The mooring of a buoy east of Aberdeen in July 1995 marked the completion of the open-ocean buoy network, two years ahead of its ten-year schedule and within budget.

During the year, Port Met. Officers made 3700 visits to British and foreign ships in UK ports. This work ensured that 500 British ships continued to make observations, and that both UK and foreign vessels maintained high observing standards.

Automation and new sensors

The main purpose of the automation programme is to reduce the cost of observing while maintaining or improving the quality of data. During this year, we introduced new automation initiatives that reduced staff time spent in observing by almost 10%, in line with the Business Plan targets.

We installed a further 14 Semi-Automatic Observing Systems (SAMOS), making a total of 75 SAMOS now in operation; we also bought a further 50 laser cloud-base recorders for future use. We were delighted that, during the extreme conditions of Winter 1995/96, automatic weather stations functioned perfectly at temperatures well below their minus 20 °C design minimum.

With an eye to the future, we continued to evaluate new observing systems and sensors, including the possible use of closed-circuit television in remote sites. Two wind-profiling radar systems were also evaluated at Aberystwyth. Intensive

tests on one system, linked to radiosonde observations, yielded a comprehensive assessment of radar errors. A field trial of the second radar provided valuable information on which to base future policy decisions. Work also started on evaluating radiosondes that make use of the satellite-based Global Positioning System (GPS) for calculating wind. We will need such alternatives when GPS supersedes the existing LORAN navigation system.

Ozone measurements

During the intensive winter ozone-sonde programme, part of the ongoing programme of ozone measurements from Camborne and Lerwick on behalf of the DoE, we observed record low levels of ozone.

Observations from space

The Met. Office and the British National Space Centre took a lead in restructuring the European Polar System and METOP-1 satellite programmes into a single programme with improved cost-effectiveness.

The Met. Office is providing all humidity-sounding instruments for use on the US National Oceanic and Atmospheric Administration (NOAA) polar-orbiting satellites. During the year, we calibrated and assessed the performance of the instruments under a wide range of conditions. We delivered the instruments for the first two flights to NOAA on time and they have successfully integrated the first instrument with its satellite. The group involved in this work carried out similar calibration work under contract for other US and European satellite sounding instruments.

The WMO awarded Dr Tony Lee the prestigious international Vilho Vaisala Award for his seminal paper on the application of signal processing and information concepts to satellite data.



Measurement of sea ice and snow taken by radiometers on the Met. Research Flight C-130 and the Helsinki University of Technology Skyvan will help make use of microwave data from satellite instruments.

CORE ACTIVITIES

Information systems

Several branches carry out the Core task of processing meteorological information. They are IT Operations, User Services, Systems Support and Systems Strategy, all within the Operational Services Division.

Performance and efficiency

We achieved the Business Plan efficiency target through savings in the IT Operations Centre. We also achieved most of the service performance targets whilst the overall work handled by the main IT production systems continues to increase. For example, the total amount of work carried out by the mainframe computer increased by over 10% and the volume of telecommunications traffic handled by the main message switch went up by over a third. Development milestones were more problematical, though we made good progress in many areas.

Satellite data reception

During the year, The Met. Office's satellite data reception and processing system transferred from an old mini-computer platform to a system based on a small workstation. We built the new system, AUTOSAT 2.5, very quickly, using modern programming tools and protocols; it runs ten times faster than its predecessor with benefits to all users.

COSMOS computer system

In October 1995, we replaced the mainframe computer – a Hitachi Data Systems EX100 which had been in operation for five years – with an IBM 9672 R73. This has increased capacity by some 65% while dramatically reducing the power and space requirements.

As part of the long-term strategy to increase our capacity to run large numerical models, in May 1995 we initiated a competitive procurement to select a supplier of a new supercomputer. This resulted in a contract with Cray Research for their T3E supercomputer system (actually placed in April 1996); the machine will be installed in three stages from August 1996. The new supercomputer is essential to meet the demands of the DoE contract for climate research and will ensure that we remain among the world's foremost centres for operational numerical weather forecasting.

Weather Information Network (WIN)

The Met. Office uses telecommunication networks for collecting observations and transferring data between sites; they also play a part in delivering services to customers. The WIN will replace a number of existing analogue and digital networks with a single, resilient, high-speed digital network.

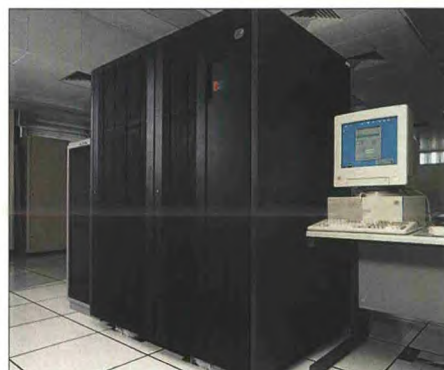
In November 1995 Digital Equipment Company Ltd (DEC) won the contract to provide the network components including the main network store-and-forward nodes. DEC will also provide the equipment required at each network node, the Outstation Communications Processor. Installation of the first element of WIN began in February 1996 and will continue until acceptance of the complete network about a year later. The new network will improve reliability, resilience and capacity, whilst substantially reducing the overall cost of the network and its support.

Global networks

Bracknell is one of several major hubs in the Global Telecommunication System (GTS) which links all the world's national meteorological centres. The European national meteorological services recognized that the European regional network needed a major overhaul to meet evolving requirements. The Met. Office is co-operating fully with European partners to define and implement a new network, taking advantage of the emerging competitive environment for telecommunication services across the European Union.

IT strategy study

Following a pilot study, we carried out a strategic review of the way we provide our IT services. We will consider the implications of this during 1996/97.



The IBM 9672 R73 was installed in October 1995, significantly increasing computing capacity.

CORE ACTIVITIES

Forecasting

There are four branches of The Met. Office directly involved in providing the Core activity of forecasting – Numerical Weather Prediction within R&D Division, and the Central Forecasting Office, Forecasting Products and Forecasting Systems within the Operational Services Division.

Performance and efficiencies

During the last year, we initiated a major Business Plan project to reduce the costs of forecast production and service provision by automating and centralizing as many processes as possible. The project reported in January 1996. We expect the proposals to deliver savings of some 75 posts (circa £3million per annum) over the next two years with an additional similar number in the following three years.

A Forecasting Systems group continued to develop ways of automating routine and repetitive tasks presently carried out by forecasters in the Central Forecasting Office (CFO) and of 'post-processing' numerical weather data for use by local forecasters. This will allow forecasters more time for analysis of the meteorological situation and hence improve the quality of their output.

This winter was much colder than recent years with a number of significant snowfall events. We forecast these well with the CFO providing successful early warning of severe weather on all occasions with a false-alarm rate of only 6.7%.

The CFO met its planned efficiency targets by introducing the Nimrod system (see **Nimrod** right), merging the medium-range forecasting and intervention tasks to create a new post of Deputy Chief Forecaster and reducing the number of support staff.

Improving forecast accuracy

Forecasts from The Met. Office global model for 1995/96 were the most accurate ever recorded. This resulted from improvements made to the treatment of small-scale mountains and their effect on the atmospheric circulation. Other model improvements produced more-realistic forecasts of precipitation near mountains and also reduced errors in upper winds downstream.

Trials of an upgraded system for processing global satellite sounding data provided useful improvement to northern hemisphere forecasts beyond the first day of a forecast. (We introduced the new system operationally on 16 April 1996.)

An extensive trial of ensemble forecasts, produced by combining the results from the European Centre for Medium-range Weather Forecasts and The Met. Office models, has shown that the joint ensemble significantly improves

accuracy. Ensemble techniques are now in operational use and we are tailoring medium-range guidance to reflect the associated uncertainty.

In the short term, we improved our mesoscale model to reduce spurious forecasts of precipitation and accepted a method of assimilating radar data more directly into the model. Trials showed improvement in precipitation forecasts out to nine hours ahead on most occasions. These benefits will also feed into the Nimrod system, and help ensure consistency between the radar observations and the model forecasts.

Horace

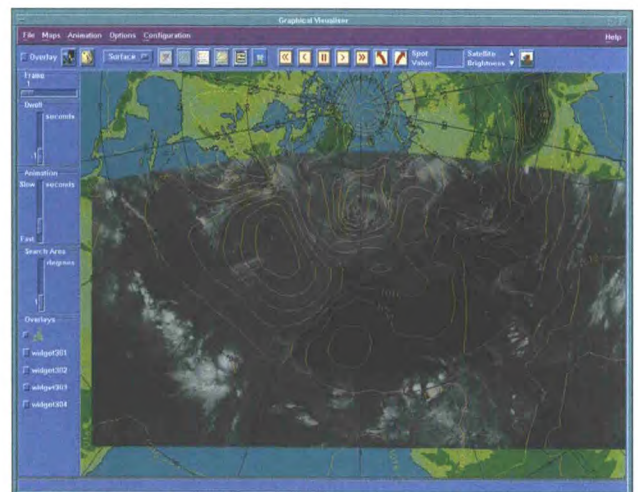
During the year, we made good progress with Horace, the main computer workstation system used in the CFO. We are gradually replacing the existing computer graphics systems with Horace and it has taken over as the platform for issuing text bulletins. While Horace workstations have only one screen, it is possible to view up to six windows simultaneously making the task of analysing information much easier. In the future, we plan to have two Horace screens at each forecast position within the CFO.

Nimrod

On 15 December 1995, we replaced our FRONTIERS rainfall prediction system with the new automated system called Nimrod. Whereas FRONTIERS required a dedicated human operator, Nimrod is an entirely automatic system. This resulted in staff savings of five posts.

Tropical cyclone forecasting

We developed a new semi-automatic computer method for forecasting tropical cyclones based on research carried out during 1994/95. The method produces objective forecasts of the track and intensity of tropical cyclones. Forecasters started using this information in the advisory messages issued to other NMSs from 1 April 1996.



The Horace system can provide the forecaster with a wide range of data and image overlays for any area of the globe.

CORE ACTIVITIES

International

WMO Congress

The Twelfth World Meteorological Organization Congress took place in Geneva in June 1995. Probably the most important outcome of the event was that, after four years of separate discussions, the Congress agreed a new policy and practice for the exchange of data and products. As a fundamental principle, the new agreement makes a commitment to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products. The international meteorological community expects this policy and practice to provide a stable platform from which national meteorological services (NMSs) and private sector organizations can develop their services in the future.

EUMETNET

For many years, the Directors of 17 NMSs of western Europe have met annually, on an informal basis, to discuss and agree joint policies and action. This year, the Directors decided to work even more closely together. This move reflects the strengthening links within the European Union, the creation of the European Economic Area, and the new challenges facing the NMSs, particularly the pressure to increase efficiency.

At a ceremony on 4 December 1995, 13 NMSs signed an Agreement known as EUMETNET (EUropean METeorological NETwork); we expect others to sign during 1996. The objective of EUMETNET is to bring to all users of meteorological information in Europe the best available quality of service through the efficient management of the collective resources of the NMSs. EUMETNET will carry this out through a series of projects, one NMS carrying out a particular project for the whole group, under contract.

Members expect to improve the quality of services through this pooling of expertise and to achieve efficiencies through economies of scale and avoidance of duplication. We expect to see EUMETNET in action early in 1996.

ECOMET

After five years of discussion between European NMSs and European Union (EU) officials, the EU granted clearance for ECOMET in August 1995. The Met. Office and six other members signed the agreement at a ceremony in Brussels on 12 December 1995; ECOMET formally came into being on 1 January 1996. ECOMET members expect more countries to sign during 1996.

The introduction of ECOMET will remove internal and national barriers to allow commercial trading across Europe. At the same time, it will provide a guarantee of equal access to basic data and products to both private and public sector meteorological organizations, as required by the recent WMO Congress Resolution.

Technical co-operation

The Met. Office continues to contribute to the WMO Voluntary Co-operation Programme (VCP) that helps developing countries to improve their meteorological infrastructure and services. This year, for example, we provided Meteorological Data Distribution systems in Eritrea and Senegal. We also procured further systems for Uzbekistan and Turkmenistan for installation in 1996. For those countries to which we have already donated Primary Data User Stations, we provided decryption systems so that they can continue to receive satellite images following the encryption of data by the satellite operators, EUMETSAT. We carried out these projects in partnership with the Natural Resources Institute (NRI), the scientific arm of the Overseas Development Administration.

We also supported the setting up of climate computer system Area Support Centres at the Caribbean Meteorological Institute, Barbados, and at the African Centre of Meteorological Applications for Development (ACMAD) in Niger.

Continuing another partnership with NRI, The Met. Office installed low-cost PC-based TV weather presentation systems at the ACMAD and in Ghana, Kenya and the Seychelles. We also initiated procurement for systems in The Gambia, Uganda and Tanzania, and provided an upgrade to the existing system in Ethiopia.

The VCP programme provided support to a total of 28 students from 19 countries on a wide range of training courses.



Alan Douglas, Marketing Director, signs the ECOMET agreement on behalf of The Met. Office – Brussels, 12 December 1995.

Atmospheric Processes

As well as The Met. Office's Core research programme, the Atmospheric Processes Research Branch carries out research and development under external contracts, much of this work focusing on dispersion.

Short-range dispersion

Over short ranges, turbulence in the atmospheric boundary layer is the main cause of dispersion. The main Met. Office tool for predicting dispersion over short ranges is the Atmospheric Dispersion Modelling System (ADMS). This is a practical PC-based system developed in collaboration with Cambridge Environmental Research Consultants and the University of Surrey.

During the year, ADMS Version 2 was released. This extended the model to include the treatment of multiple sources and pollutant species, and area and line sources. It also improved the treatment of concentration fluctuations, buoyant plume-rise and the effects of buildings. The change also introduced a new user interface and graphical output. We expect these improvements to increase the range of applications of ADMS within The Met. Office.

Medium- and long-range dispersion

In March 1996, we introduced version 2.1 of the Nuclear Accident Model (NAME), a mesoscale and long-range multiple-particle dispersion model, as the operational model for emergency response in the event of a nuclear accident. This work was carried out under contract to the DoE Radioactive Substances Division.

Improvements to the model during the year included scavenging coefficients for washout from mixed-phase (ice and water) cloud, and a representation of plume-rise at source. Although the resolution of the input winds and meteorology for models of this type is fixed, it is possible to analyse the model output on any scale for which the statistics of particle distribution are effectively stationary. Accordingly, we have added a user-definable, high-resolution, near-source analysis grid to the model. This has already proved its worth in a recent investigation of a sulphur pollution episode at Leeds in September 1994. Carried out on behalf of HM Inspectorate of Pollution, the new analysis grid enabled us to determine the features of the meteorology and atmospheric stability that controlled the incident.

Provisional analyses of data from the 1994 European Tracer Experiment, the international comparison of long-range dispersion models, showed that NAME produced good correlation between observed spread and model predictions. It performed particularly well in comparison with other models during the latter stages of the spread.

Urban pollution

We have introduced an improved model for the national daily forecasts of urban pollutants. The model takes urban heating effects into account, and separates NO_2 from the forecast of NO_x . Comparisons with observations from the DoE urban monitoring network during the summer showed that the model performed better for large conurbations than for smaller towns. Trials with an associated street canyon model showed a fall-off of performance in summer; this is likely to be due to the heating effects of strong sunlight.



An improved model for the national daily forecasts of urban pollutants now provides better information about levels of NO_2 and NO_x .

Climate Research

The Met. Office undertakes climate research at the Hadley Centre. The main aims of the Centre are to understand processes which control climate and represent them in models, to predict climate change over the next decades, to monitor climate and to attribute any change to specific influences. The Department of the Environment (DoE) support much of the work; they require the programme to underpin UK policy on controls to greenhouse-gas emissions, under the UN Framework Convention on Climate Change. The MoD support complementary work as part of the Public Meteorological Service.

Performance

We carry out the DoE programme in line with Business Plan objectives. One significant focus during 1995/96 was the detection of climate change and its attribution to human influences. Model simulations indicate that the observed increase in global temperature over the last 100 years is very unlikely to be due to natural internal variability. When the effects of carbon dioxide and aerosol from human activities are included, comparisons of model-simulated spatial patterns of temperature change indicate better agreement with observed values. These results had a strong influence on the 1995 report from the Intergovernmental Panel on Climate Change (IPCC) which concluded, with proper caution, that ‘the balance of evidence suggests a discernible human influence on global climate’.

The development of a new Hadley Centre climate model is close to completion. Two of the main improvements are a more detailed radiation scheme and a reduction in the ocean grid size to 1.25° latitude and longitude. Initial experiments have shown that the latter markedly improves the realism of ocean currents.

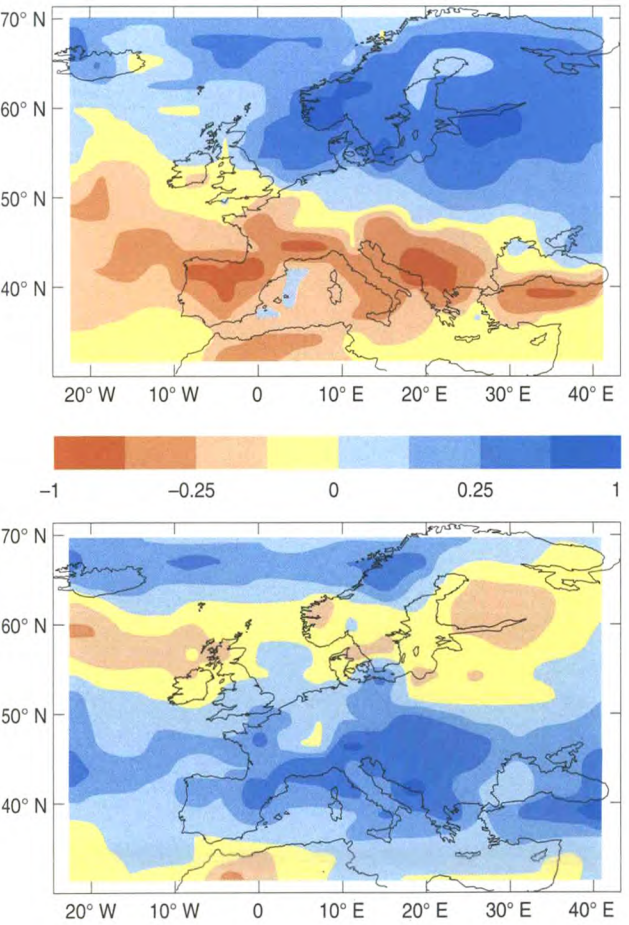
There has been good progress in other modelling areas. The Lagrangian atmospheric chemistry model has simulated pre-industrial and present-day concentrations of ozone and oxidants. The sulphur-cycle model has done the same for sulphate aerosol. The land carbon-cycle model has generated maps of present-day rate of uptake of carbon by plants and the ocean carbon-cycle model has included for the first time the effects of biological processes on carbon fluxes. A new surface exchange scheme gives more-realistic thermal responses of the soil to the seasonal cycle.

Climate monitoring is crucial to improving the understanding of climate change and to answering questions regarding its detection and attribution. Through the use of new analytical techniques, we have greatly improved the Global sea-ice and Sea-Surface Temperature (GISST) record in the data-sparse period before 1950. New radiosonde-based temperature analyses for the troposphere and lower stratosphere are already proving invaluable for climate change detection

projects. The combining of Hadley Centre marine temperature data with land-surface data from the University of East Anglia showed that the global-mean near-surface temperature in 1995 was the highest since the global record started in 1860.

The Hadley Centre also hosts the DoE-funded Technical Support Unit (TSU) of the science working group of the IPCC. TSU staff organized the preparation of the IPCC’s second Science Assessment of climate change, agreed at a meeting of scientists and government representatives in Madrid in November 1995. The Unit published the final report in Spring 1996.

Chris Folland and four members of his Climate Variability group, together with a collaborator from the University of Lancaster, received the 1996 Norbert Gerbier–Mumm Award from the WMO for an outstanding paper on seasonal forecasting.



The inclusion of sulphate aerosols with greenhouse gases has a significant effect on predicted changes in summer rainfall patterns over Europe; in particular, it reverses the decrease predicted for southern Europe and the Mediterranean with greenhouse gases only, to give increases in rainfall instead.

Ocean Applications

The Ocean Applications Branch was formed during the year to draw together The Met. Office's work in the development of ocean models for climate prediction (including ocean carbon-cycle and sea-ice models), the development of a real-time ocean analysis and forecasting system for the Royal Navy, operational wave modelling, and tropical models and seasonal prediction.

Ocean models for climate prediction

A new version of the coupled atmosphere–ocean model, with a horizontal resolution in the ocean of 1.25° , has produced considerably more-realistic simulation of the major ocean currents, the sub-polar gyres and the equatorial current systems.

However, coupled models exhibit systematic errors. For example, they tend to have difficulty in simulating the sea-surface temperatures (SSTs) around the Antarctic continent. We significantly reduced this erroneous warming by improving the way we represent horizontal eddy transports in the model.

Ocean analysis and forecasting

The Forecasting Ocean–Atmosphere Model (FOAM) is being developed to forecast the temperature and salinity of the upper ocean. A prototype of the system has run routinely since August 1994 so we now have more than a year of analyses. We have used these to assess the accuracy of the system and to clarify some of the systematic errors in the ocean model.

While satellites can measure the SST accurately, they cannot observe what is happening below the sea surface. However, radar altimeters measure the departure of the surface elevation of the ocean from a reference state, and can be used to deduce information about the deep circulation of the oceans. During the year, we have taken preliminary steps to incorporate radar altimetry observations into the FOAM system.

Wave modelling

For many years The Met. Office has used its own second-generation wave model to forecast sea state on both global and regional scales. In order to improve the accuracy of wave forecasts, we have adopted the international third-generation Wave Model (WAM) and have made good progress in converting it for use within the Unified Model.

As part of the Storm Tide Warning Service, The Met. Office runs a numerical model of the north-west European continental shelf. In a joint project with NERC's Proudman Oceanographic Laboratory, this model is being prepared for running on a workstation in order to assess its usefulness for forecasting currents. Such forecasts will be useful for many

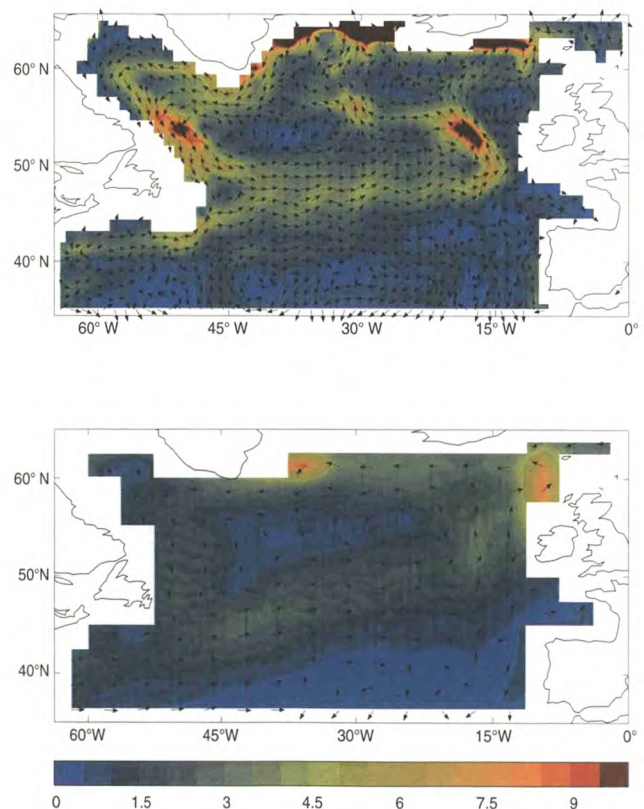
surface and sub-surface activities such as fishing and offshore exploration.

Tropical modelling and seasonal prediction

On seasonal to inter-annual timescales, the largest climate variability occurs in the tropical Pacific region. Here, the El Niño Southern Oscillation (ENSO) events which occur are associated with major changes in the ocean and atmosphere. They have a global impact and have been demonstrated to be predictable at a range of several months. There is increasing evidence of a 'teleconnection' between some European seasonal climate biases and ENSO.

The group has developed dynamical atmosphere–ocean models to predict ENSO and its associated global climate effects. A tropical Pacific Ocean general circulation model has useful predictive skill at a range of several months. In another version, the ocean model is coupled to a version of the Hadley Centre's global atmospheric model. This coupling is able to simulate inter-annual variability well.

For most forecasts, we obtain the initial ocean conditions by forcing the ocean model with observed winds only. However, we can produce better initial conditions – and hence better forecasts – by making use of ocean observations and we do this in collaboration with FOAM.



Output from the new higher-resolution ocean model ($1.25^\circ \times 1.25^\circ$) (top) defines the Atlantic gyre in much more detail than was possible from the original model ($2.5^\circ \times 3.25^\circ$) (bottom).

Public Meteorological Services

The Met. Office provides a range of public safety and information services for the benefit of the public at large. We provide these services under the terms of the Charter Standard for the Public – see Appendices on page 46 of this publication – and as defined in the Business Plan targets. The following describes the main features of this year’s performance targets and achievements.

National Severe Weather Warning Service

The main measure of performance is the satisfaction of our customers in the emergency organizations as measured by a satisfaction survey. The target for Customer Satisfaction Index of 0.80 was narrowly missed. But, a very high number of respondents (92%) expressed overall satisfaction with the service provided. We sent successful early warnings of widespread severe weather to the emergency organizations on 38 occasions, concentrated around 14 severe weather events.

The service also includes the issue of FLASH messages warning of the immediate occurrence of severe weather. As well as being sent to emergency organizations, we offer these to radio and television for broadcast to the public. The severe winter weather of 1995/96 produced almost three times as many FLASH warnings of snow as in 1994/95.

Storm Tide Warning Service

During the course of the winter, staff issued a total of 32 east coast tidal warnings, close to the average number, and we met all four performance standards agreed with MAFF. The event of 19–20 February 1996 was the most significant, accounting for almost half the warnings issued.

Marine services

As in previous years, we set challenging targets for hit rates and false-alarm rates for gale warnings covering coastal sea areas. We met neither this year, due almost entirely to a difficult December, highlighting the problems of forecasting for extremes. We correctly warned of gales on 78% of occasions, against the target of 81%, whilst the false-alarm rate was 20% against the target of 18%.

Pollution emergencies

For 1995/96, we introduced a target for the provision of meteorological advice in the event of a nuclear or toxic chemical pollution incident. This requires us to provide advice on the expected dispersion of the chemical, or trajectory of the particles, within 30 minutes of notification on at least 85% of occasions. However, in this first year, a figure of only 81% was achieved. As we are committed to improving our performance for this vital service, we have increased our target in 1996/97 to 87%.

Public information

Since 1972, The Met. Office has continuously monitored the accuracy of the forecasts broadcast on BBC Radio 4 at 1755, providing one of our longest-running sets of verification statistics. Accuracy has climbed steadily throughout the period and we achieved 84.5% in 1995/96, just exceeding the challenging target of 84%.

In November, The Met. Office launched a World Wide Web site on the Internet. This increased public access to weather information and has opened the way for many more enquiries! The service contains shipping forecasts, weather warnings and some basic forecasts, together with a copy of the Charter Standard for the Public.

More-traditional forms of providing information continued to grow, with loans from the National Meteorological Library to the public and other libraries up by nearly 25%. Telephone enquiries continued at a high level and a survey during June revealed that we received over 8000 at the Weather Centres and Bracknell during a seven-day period. For the second year in succession, the number of complaints received from the public fell, with a significant 30% reduction on last year’s figure.



The Met. Office World Wide Web site was launched in November 1995 and has been praised in a recent survey of users as the best weather site on the Internet.

Defence

The Defence Business Area provides services to the Armed Forces. As part of the restructuring of The Met. Office in preparation for Trading Fund, Defence Services became a constituent of the new Services & Business Directorate from 1 May 1995.

A major activity this year has been to negotiate and agree Schedules of Requirement with ten military commands and the Defence Evaluation and Research Agency (DERA), again in preparation for Trading Fund. Staff successfully finalized a Trading Agreement, put in place invoicing and payment mechanisms, and offered presentations to customers.

Performance and efficiencies

A number of important customer satisfaction targets are defined in the Business Plan. Defence forecasters once again achieved their customer satisfaction target, with an excellent Satisfaction Index score of 0.87 against a target of 0.83.

We also measured the success of Terminal Aerodrome Forecasts (TAFs) that cover conditions for use by aircraft taking off or landing. TAFs are shorthand forecasts of wind, visibility, low cloud, etc. Averaged across UK stations, we achieved a success score of 0.85.

The continuing consolidation by the military into fewer, but larger, units again helped us to increase efficiency. In line with changes in customer requirements, we closed offices at Finningley, Scampton, Machrihanish, Netheravon and Porton.

During the year, we developed a scheme to measure our ability to forecast cloud, visibility, wind, and significant weather at military airfields. The scheme is sufficiently flexible to assess the value added by a forecaster in comparison with output provided directly from the Numerical Weather Prediction system. We plan to introduce it in a phased programme at all military airfields starting 1 April 1996.

In January 1996, the Regional Manager Southern Scotland, based at Glasgow Weather Centre, took over responsibility for Defence meteorology in Scotland. The office at RAF Leuchars lost its Defence Main Meteorological Office status, the overall change producing a saving of seven staff.

In the Mediterranean, the training programme for locally employed forecasters at Gibraltar progressed smoothly and local staff will replace three UK-based staff in summer 1996. At RAF Akrotiri, Cyprus, further automation during the year will allow us to reduce the level of locally employed support staff by five posts from 1 April 1996.

Mobile Meteorological Unit (MMU)

The Unit has been very active throughout the year both with routine exercises and in support of UN and NATO operations in Turkey, the Former Republic of Yugoslavia (FRY) and Italy. With NATO's Implementation Force succeeding the UN Protection Force in December 1995, the UK's lead meteorological role with the NATO ACE Rapid Reaction Corps resulted in expansion of the MMU in the FRY. The main forecasting unit at Split, Croatia, now provides forecasts to over 30 military customers and a number of other agencies.

Due to the quasi-permanence of the overseas MMU commitments, we recruited several new officers. These included the first female forecaster in the Unit, Flying Officer Sarah Kent, deployed to Gioia del Colle, Italy, in March 1996.

Service delivery

We have continued to improve the distribution of data to MMU meteorologists in the field. We delivered five 'ruggedized' mobile Outstation Display Systems and set up satellite communication facilities, providing much greater flexibility in deployment. Two complete systems are currently in operation with the MMU in the FRY.

In December 1995, we started an MoD-sponsored trial to assess the feasibility of providing meteorological support to an RAF base from a remote location. In this trial, the RAF chose the office at RAF Coningsby to provide all support for RAF Marham as well as the normal services to the local base. To ease the workload, we introduced IT-based information distribution systems. We expect the trial to finish in early July 1996 with an RAF report following later.



Wg Cdr Bill McQueen, Officer Commanding MMU, at work on one of their 'ruggedized' mobile Outstation Display Systems.

Civil aviation

This Business Area provides services to the civil aviation industry, mainly through the key customer, the Civil Aviation Authority (CAA), while meeting relevant International Civil Aviation Organization (ICAO) requirements. As with Defence, Aviation became a major constituent of the Services & Business Division in May 1995.

Performance and efficiencies

During a busy year, we successfully met the key Business Plan target relating to customer satisfaction for the CAA service. Moreover, improvements to our UM predictions allowed us to achieve the accuracy target for upper-wind forecasts. For next year, we have agreed increasingly challenging targets for accuracy and timeliness.

During the year, ICAO agreed changes to the international codes for the exchange of meteorological information, requiring introduction by 1 January 1996. We successfully met this deadline, rewriting software and distributing the necessary instructions to the aviation community.

The satellite communications system SADIS started operational transmission of aeronautical data in July 1995. We developed SADIS on behalf of ICAO and successfully met their technical specifications and target dates. SADIS is part of the ICAO communications network and forms part of their World Area Forecast System; it allows the rapid collection and dissemination of meteorological data on a global scale. Through the use of SADIS, the aviation community benefits from the high-resolution global upper-wind and temperature forecasts now being produced by the two World Area Forecast Centres (WAFc), Bracknell (known as London) and Washington. These data provide increasingly accurate winds for flight planning, resulting in fuel savings and reduced costs for the airlines. In the future, we expect to phase out the original coarser grid-point information, resulting in reduced production costs.

In response to an improved timeliness target, we have improved computer facilities allowing earlier access to global aviation data.

Service delivery

By 31 March 1996, 30 users were linked into SADIS and receiving data; 50 potential users are obtaining the necessary equipment. Those receiving the data are responding very positively to the service.

In line with the ICAO Regional Planning agreements, WAFc London successfully took over the supply of SIGWX data previously supplied by the Regional Aviation Forecast Centre (RAFC) Frankfurt. Development is also on target for the transfer of the responsibilities of RAFC Toulouse to WAFc London by December 1996.

As part of the support service to CAA, The Met. Office provided advice and papers on meteorological matters for presentation at both international and national meetings; Met. Office experts supported the CAA at two User Forum meetings to discuss Meteorological Aviation Services. We also provided training seminars in connection with the WAFc/SADIS services, both at home and abroad; and the Met. Office College was the venue for a joint WMO/Met. Office aeronautical seminar for aviation meteorologists from countries within the SADIS footprint.

In response to customer feedback, we made improvements to various products supplied on The Met. Office facsimile service (MetFAX). Seven new customers signed up to take the Aviation MIST service.

During the year, improvements were made to the format of the WAFc London newsletter; its circulation has steadily increased. Designed to inform customers about the latest developments to services and products provided by the WAFc, the quarterly newsletter serves as a valuable focus for customer feedback and comment.



Representatives of the Chinese meteorological service visited the UK in early February 1996 to investigate the availability of equipment for the display of SADIS data.

Commercial

The Commercial Services Business Area provides services to many sectors of industry and commerce, excluding the Civil Aviation Authority.

Performance and efficiencies

Commercial Services has enjoyed another successful year. The Met. Office achieved a commercial revenue of £20.8 million, an increase of 1% on last year, although some £0.7 million short of target. During the year, we took action to improve contribution levels. By the end of the year, the annualized return was well above the Business Plan target, though the overall contribution within the year was about £0.3 million below. The shortfall has been largely due to the downward pressure on prices from increasing competition and severe cost-cutting measures in industry.

We increased contribution by introducing strict control of costs and by developing services in existing and new markets. For example, linked to changes in the energy sector, we extended our existing services and also introduced new services to the emerging independent gas shippers.

Improvement in contribution also came from our increasing success abroad, international business now accounting for 12% of revenue. We expect the signing of the ECOMET agreement in December 1995 to yield further increases as we develop services inside the European Union.

The annual customer satisfaction survey continues to show that our customers recognize our commitment to them. In response to questions, 75.7% of respondents supported the statement that overall service is excellent.

During the year, Commercial Services staff played a major part in an Office-wide study into rationalizing service production. We propose to introduce changes from summer 1996 and phase them in over the next five years. We expect these to reduce production costs whilst improving the direct support to customers. Quality measures will feature strongly in all stages of production.

Developments in services

The Met. Office launched its World Wide Web site on the Internet in October 1995, with favourable reviews in the specialist press. Since then, we have twice upgraded the content and style and are working to develop the commercial opportunities.

In November 1995, we signed an agreement with KNMI, the Netherlands meteorological service, allowing them to operate a similar service to The Weather Initiative (TWI), our specialist retail sector business unit. The new organization will carry the TWI name and receive our support, both parties sharing in the returns.

Our existing Singapore-based joint venture with GEOS, part of the Wimpey Group, has successfully developed offshore services in South East Asia and has secured some 40% market share after only two years of trading. We also signed new commercial agreements with the Chinese meteorological service to cover the sales and production of our MetROUTE service (ship-routeing service); with GEOS for the development of international offshore services and with WS Atkins for the development of environmental services. These, and other, collaborative ventures will become increasingly important. In February 1996 we introduced a specialist bid team to exploit The Met. Office's R&D effort, including major systems.

International Weather Productions (IWP), our specialist TV business unit, won the bid to supply services to GMTV from January 1996; they also succeeded in retaining contracts put out to competitive tender and in winning some services from competitors. Our association with the BBC continues, the most notable development being an increase in the number of international TV broadcasts for BBC World. This successful partnership will see further growth when the BBC complete their new weather studio next year.

Over the years, we have enjoyed a very successful relationship with Telephone Information Services (TIS). During 1995/96, both parties felt that it would be beneficial to change the terms of the original agreement. Under a new arrangement, whilst continuing to work with TIS in the provision of audio and fax services, The Met. Office has been able to develop and launch new services in the MetFAX range, including an important service for mountaineers and hillwalkers, MetFAX Mountain.

The Met Office

MetFAX
REGIONAL
5-DAY FORECAST
DIAL **0336 400 41**
PLUS AREA NUMBER
ON YOUR FAX MACHINE

INDEX OF SERVICES
0336 400 400

NATIONAL FORECAST
0336 400 410

MetCALL
REGIONAL 5-DAY
FORECAST BY PHONE
DIAL **0336 444 900**
AND KEY IN YOUR AREA NUMBER, OR FOLLOW VOICE PROMPTS

AA Roadwatch
PHONE **0336 401 900**
Latest reports of traffic hold-ups and roadworks
on national roads and motorways.

To use FAX – lift handset, dial number and press
START/RECEIVE after message or set Fax to poll
receive mode. Any problems, contact our Helpline.

**MOUNTAIN WEATHER FORECASTS
BY PHONE AND FAX FROM**

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• INCLUDES SCOTTISH HIGHLANDS SNOW
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0891 500 PLUS

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0336 500 PLUS

442 EAST HIGHLANDS 442
Grampians East of Rannoch Moor & Cairngorms

441 WEST HIGHLANDS 441
Trossachs, Argyll, Lochaber, NW Highlands & Skye

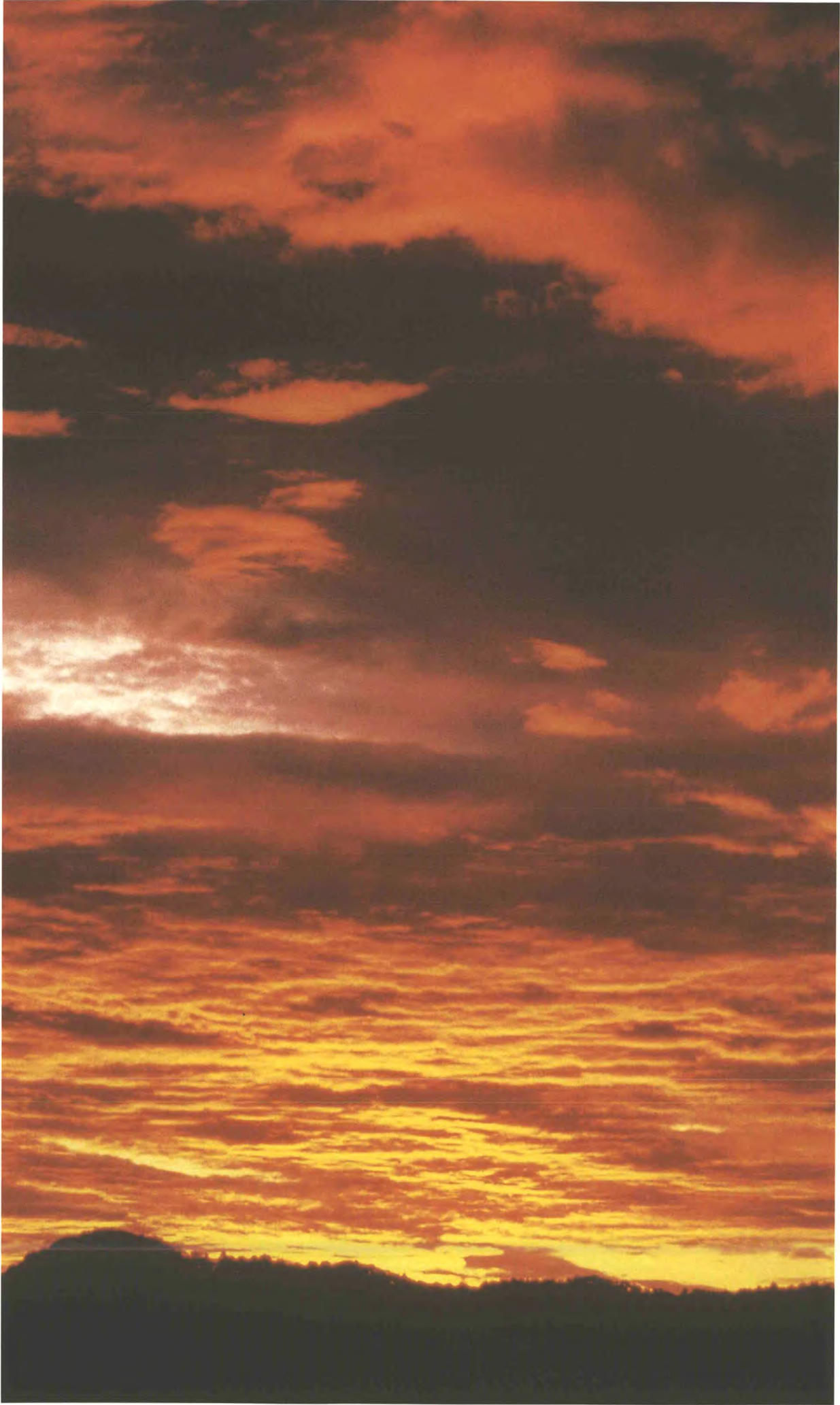
449 SNOWDONIA 449

Calls cost 39p per minute cheap rate, 49p per minute at all other times. Jan '96

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Cards promoting the new MetFAX Mountain service, one of the latest in the successful MetFAX range, have been widely distributed through many channels including inserts in specialist publications and mailshots to mountaineering and climbing clubs.



Foreword to the accounts

The accounts for The Met. Office have been prepared in accordance with the Direction given by the Treasury on 1 July 1993 in pursuance of section 5(1) of the Exchequer and Audit Departments Act 1921. The Direction is reproduced on pages 44 and 45 of the Annual Report and Accounts.

The Met. Office was established as the Meteorological Department of the Board of Trade in 1854 and adopted the title of Meteorological Office in 1867. Separate meteorological branches for each of the armed forces were set up in 1914 and The Met. Office became part of the Air Ministry in 1920. This became part of the Ministry of Defence (MoD) in 1964 and The Met. Office became an Executive Agency on 2 April 1990 as part of the Government's 'Next Steps' initiative. The accounts for the year to 31 March 1996 are the last set of accounts as a Vote-funded Executive Agency. The Met. Office became a Trading Fund on 1 April 1996 in accordance with Statutory Instrument (SI1996/774).

The principal activities of The Met. Office are set out on page 2. There have been no significant changes in these activities during the year.

The operation of The Met. Office is overseen by the Defence Meteorological Board, and the Chief Executive is advised by the Meteorological Committee and its Research Sub-committee. The day-to-day business of The Met. Office is managed by the Management Board, as shown on page 11, supported by two additional Directors.

In preparation for the change in status of The Met. Office on 1 April 1996 from a Vote-funded basis to a Trading Fund, plant and equipment has been revalued to take account of its value to the business, and provision has been made for future estimated net costs on leasehold properties which have been declared surplus to requirements. These adjustments are shown in the Net Expenditure Account as exceptional items after net expenditure, on a comparable basis with previous Agency accounts.

The total expenditure of The Met. Office, before exceptional items, in the year ending 31 March 1996 was £151.0 million (1994/95 £148.4 million) and a total of £59.7 million (1994/95 £57.0 million) was recovered from repayment customers. The balance, representing net expenditure on a comparable basis with the previous year and the key target, was £91.3 million (1994/95 £91.4 million). On this basis the key target of £92.8 million (£90.3 million at 1994/95 prices) was met. The cash limit target of £80.5 million (£78.3 million at 1994/95 prices) was also met, with a cash expenditure of £ 78.8 million (1994/95 £73.6 million) (see Note 18). These are the only two targets that can be derived

directly from the accounts. After adjustments for exceptional items, net expenditure was £104.3 million and total assets less current liabilities were £84.2 million.

The assets and liabilities appropriated to the Trading Fund are shown at Note 19. The total net assets of £72.7 million take into account adjustments in consequence of The Met. Office operating as a Trading Fund from 1 April 1996.

It is considered that there is no significant difference between the open market value and the book value of land on an existing use basis.

Payments to suppliers are predominantly made direct from The Met. Office. The policy is to pay suppliers within 30 days of receipt of the invoice, or of the delivery date if later. Where payments are made direct from MoD, the policy is to pay suppliers within 30 days (as specified by the CBI Code – Prompt Payment).

A programme of applied Research and Development is conducted in support of the operational services provided by The Met. Office. Additional Research and Development concerning man-made climate change is conducted under contract to the DoE.

The Met. Office is committed to a policy of Equal Opportunity. The only test applied for recruitment, retention, training or advancement is the ability to do the job.

Formal consultation with staff is undertaken through The Met. Office Functional Whitley Committee, its sub-committees and local committees. The Met. Office regards the health, safety and welfare of its employees (and others) as of paramount importance. A full-time Health and Safety Officer is employed to ensure that all staff are fully aware of new and existing requirements and of their responsibilities. Employee involvement is through the Health and Safety sub-committee of the Functional Whitley Committee. In addition, the Trades Unions have been consulted on a range of special issues including changes in personnel management arrangements and the introduction of new pay and grading structures. Staff are informed of new developments within The Met. Office by circulars and *Mercury*, the house magazine.



JCR Hunt
Chief Executive
10 October 1996

Net Expenditure Account for the year ended 31 March 1996

	Note	1995/96 £ million	1994/95 £ million
INCOME			
Income from repayment customers	2	<u>59.7</u>	<u>57.0</u>
EXPENDITURE			
Staff costs	3	65.3	65.3
Accommodation charges	4	8.6	7.5
Other costs			
Operational activities:			
Observations			
Central Forecasting			
Data Collection and Processing	5	34.6	36.1
Commercial activities, Research and Administration	6	26.6	26.8
International subscriptions	7	8.3	5.4
Total operating expenditure	2	<u>143.4</u>	<u>141.1</u>
NET OPERATING EXPENDITURE	2	83.7	84.1
Loss on disposal of fixed assets		2.0	0.9
Interest charges on capital	1D	5.6	6.4
NET EXPENDITURE before exceptional items		91.3	91.4
Permanent diminution in the value of fixed assets	8 (iii)	10.8	—
Provision for reorganization costs	12	2.2	—
NET EXPENDITURE after exceptional items		104.3	91.4
(representing THE NET DEPARTMENTAL COST OF OUTPUT)			

The notes on pages 34 to 41 form part of these accounts.

The movement on the General Reserve is set out at Note 17 on page 40

Balance Sheet as at 31 March 1996

	Note	31 March 1996		31 March 1995	
		£ million	£ million	£ million	£ million
FIXED ASSETS					
Intangible	8		49.1		43.8
Tangible	8		32.8		54.4
			<u>81.9</u>		<u>98.2</u>
CURRENT ASSETS					
Stocks	9	1.8		1.8	
Debtors and prepayments	10	13.6		11.9	
		<u>15.4</u>		<u>13.7</u>	
CURRENT LIABILITIES					
Creditors: amount falling due within one year	11	<u>(13.1)</u>		<u>(11.8)</u>	
NET CURRENT ASSETS					
			2.3		1.9
TOTAL ASSETS LESS CURRENT LIABILITIES					
			<u>84.2</u>		<u>100.1</u>
FINANCED BY					
Creditors: amount falling due after one year	11		2.9		8.6
Provisions for liabilities and charges	12		<u>2.2</u>		<u>—</u>
			5.1		8.6
Revaluation Reserve	16	(0.1)		1.0	
General Reserve	17	<u>79.2</u>		<u>90.5</u>	
Government funds			79.1		91.5
			<u>84.2</u>		<u>100.1</u>



The notes on pages 34 to 41 form part of these accounts

JCR Hunt
Chief Executive
10 October 1996

Cash Flow Statement for the year ended 31 March 1996

	1995/96 £ million	1994/95 £ million
NET OPERATING EXPENDITURE	83.7	84.1
(From the Net Expenditure Account)		
Adjustments for items not involving the movement of funds:		
Depreciation	(22.2)	(23.4)
Departmental costs	(2.2)	(2.2)
Stocks (decrease)	0.0	(0.4)
Debtors increase/(decrease)	2.5	(2.3)
Creditors (increase)	(3.2)	(2.3)
NET CASH OUTFLOW FROM OPERATING ACTIVITIES	58.6	53.5
SERVICING OF FINANCE		
Interest element of finance lease rentals	0.4	0.9
INVESTING ACTIVITIES		
Payments to acquire fixed assets	26.9	30.6
Proceeds from sale of fixed assets	(0.3)	(2.6)
	26.6	28.0
NET CASH OUTFLOW BEFORE FINANCING	85.6	82.4
FINANCING		
Payments from Defence Appropriation Accounts	150.9	148.5
Receipts from Defence Appropriation Accounts	(64.8)	(67.2)
Adjustment for VAT	(0.5)	1.1
NET CASH INFLOW FROM FINANCING (Note 18)	85.6	82.4
INCREASE/DECREASE IN CASH	NIL	NIL

The notes on pages 34 to 41 form part of these accounts

Statement of recognized Gains and Losses for the year ended 31 March 1996

	1995/96 £ million	1994/95 £ million
Net expenditure after exceptional items for the financial year	104.3	91.4
Unrealized deficit/(surplus) on revaluation of fixed assets debited/(credited) to revaluation reserve	1.1	(2.6)
Total net expenditure and gains and losses recognized during the financial year	<u>105.4</u>	<u>88.8</u>

Reconciliation of movements in Government funds

	1995/96 £ million	1994/95 £ million
Government funds at 1 April	91.5	90.2
Total net expenditure and gains and losses recognized during the financial year	(105.4)	(88.8)
Net cash flow from financing	85.6	82.4
Notional charges	7.4	7.7
Government funds at 31 March	<u>79.1</u>	<u>91.5</u>

The notes on pages 34 to 41 form part of these accounts

Notes to the accounts

1. Accounting policies

A. Basis of accounting

The accounts for The Met. Office have been prepared in accordance with the Accounts Direction issued by HM Treasury on 1 July 1993 pursuant to section 5(1) of the Exchequer and Audit Departments Act 1921 (see pages 44 to 45). The accounts follow the accruals concept of accounting and the historical cost convention, modified to include revaluations of fixed assets and stocks as set out in the Notes F, G and H below. Subject only to compliance with the requirements set out in the Accounts Direction, the accounts also:

- (i) comply with the accounting and disclosure requirements of the Companies Act 1985 insofar as they are consistent with the status of a Vote-funded Agency of the Ministry of Defence (the Department); and
- (ii) comply with accounting standards issued or adopted by the Accounting Standards Board unless they are deemed to be inapplicable by the Treasury.

B. Value Added Tax

The Agency is not separately registered for Value Added Tax (VAT) as VAT is accounted for centrally by the Ministry of Defence (MoD). Amounts included in the Net Expenditure Account and the Balance Sheet are exclusive of VAT. The Defence Appropriation Accounts are inclusive of VAT and VAT is therefore included as a reconciling item in the financing section of the Cash Flow Statement.

C. Income

Income comprises the invoiced value of services supplied to the private sector, the wider public sector and other Government departments. The funding of the Agency by the Department is shown in the Cash Flow Statement. Income received under collaborative arrangements for the capital installation of weather/rainfall radar systems is credited as deferred income within creditors until tangible fixed assets are acquired.

D. Notional charges

(i) Departmental overhead charges

Notional amounts are included in the Net Expenditure Account for charges in respect of services provided from other areas of the Department.

(ii) Interest charges on capital

A notional charge for interest on capital is included in the Net Expenditure Account calculated at 6% of the average value of total assets less current and long-term liabilities. The finance charges in respect of finance leases are also included.

E. Research and Development

All research and development expenditure incurred during the year is charged to the Net Expenditure Account.

F. Tangible fixed assets and depreciation

(i) Land and buildings

(a) Where the Agency is the principal beneficial user of the Departmental Estate, such estate is treated as an asset of the Agency although legal ownership rests with the Secretary of State for Defence.

(b) A valuation of the Departmental Estate assets of the Agency was carried out at 1 November 1995 by the Valuation Office in accordance with the Statements of Asset Valuation Practice and Guidance Notes issued by the Royal Institution of Chartered Surveyors.

(c) All leasehold property is held under operating leases as defined by Statement of Standard Accounting Practice Number 21. Major enhancements are capitalized.

(ii) Plant and equipment

(a) Plant and equipment, including computers, is capitalized where the useful life exceeds five years and the cost of acquisition and installation exceeds £5000 (1994/95 £4500) excluding VAT. From 31 March 1996, The Met. Office has also capitalized networked minor computers, and related equipment, which individually do not meet the criteria.

(b) Certain meteorological equipment installed in commercial aircraft or at sea is not capitalized as it is outside the direct control of The Met. Office and has an uncertain operational life.

(c) Major items of capitalized plant and equipment are revalued annually using the Gross Domestic Product Deflator Index.

(d) The net book value of plant and equipment has been revalued to take account of its value to the business in preparation for the move to Trading Fund status on 1 April 1996. This valuation is based on a valuation at 14 December 1995 carried out by professional valuers (Grimley).

(iii) Depreciation

Freehold land is not depreciated. Depreciation on buildings, mainframe computers, plant and equipment is calculated to write off the cost, or value, by equal installments over the asset's estimated useful life. A residual value equal to one year's depreciation is retained. Asset lives are periodically reviewed for technological obsolescence.

Asset category	Estimated useful life
Buildings	Not exceeding 50 years
Mainframe computers	Seven years
Plant and equipment	Between five and ten years

G. Intangible assets

The Met. Office is a member of EUMETSAT and, as such, contributes to the cost of its satellite programmes. The Met. Office benefits from the data and services resulting from these programmes. Expenditure on individual programmes is capitalized and revalued annually using the Aerospace Combined Input Cost Index. The value of each programme is depreciated from the date that the programme becomes operational over its expected life (currently of the order of ten years) using the straight line method.

H. Stocks

Stocks are valued at the lower of cost, or net current replacement cost if materially different, and net realizable value.

I. Leasing commitments

Assets held under finance leases, which are those where substantially all the risks and rewards of ownership of the asset have passed to The Met. Office, are capitalized in the Balance Sheet and are depreciated over their useful lives. The interest element of the rental obligations is charged to the Net Expenditure Account over the period of the lease and represents a constant proportion of the balance of capital repayments outstanding.

J. Early retirement

Normal accounting practice is to provide for the full cost of early departure of employees in the year in which the early departure decision is made. However, for employees leaving between 1 October 1994 and the start of trading fund status, 1 April 1996, only 20% of the payments made in the year ending 31 March 1996 were borne by the Agency, the remaining 80% being met from the Civil Superannuation Vote. The Treasury issued a direction that, whereas the 20% element borne by the Agency should be charged to the Net Expenditure Account straight away and taken to a provision on the Balance Sheet, the annual payments from the Civil Superannuation Vote in respect of the 80% element should be reflected (as notional costs) in the Agency's Net Expenditure Account when actually paid.

2. Segmental reporting

The analysis of net operating expenditure by business segment was as follows. This note meets the requirements of the Treasury's Fees and Charges guide.

	Income	Expenditure	Net operating expenditure/ (income)	Income	Expenditure	Net operating expenditure/ (income)
	1995/96	1994/95				
	£ million	£ million	£ million	£ million	£ million	£ million
Intra-Departmental	1.3	88.1	86.8	—	86.4	86.4
Inter-Departmental	12.1	11.4	(0.7)	13.0	11.1	(1.9)
Commercial and Aviation Services	46.3	43.9	(2.4)	44.0	43.6	(0.4)
	59.7	143.4	83.7	57.0	141.1	84.1

There were no acquisitions or discontinued operations.

3. Staff

(i) The staff costs were:

	1995/96 £ million	1994/95 £ million
Salaries, wages and allowances	54.3	54.6
Social security costs	4.0	4.0
Pension costs	7.0	6.7
	<u>65.3</u>	<u>65.3</u>

(ii) The average number of staff employed in Civil Service grade bands during the year was:

	1995/96	1994/95
Unified Grades 2–7	186	195
Other grades:		
Scientific	1611	1711
Technical	146	159
Administrative and support	285	307
Locally employed civilians overseas	25	26
	<u>2253</u>	<u>2398</u>

There were 2188 staff employed at 31 March 1996 (31 March 1995, 2323 staff), of whom 50 left on that day.

(iii) Professor JCR Hunt, the Chief Executive, received total emoluments, excluding pension contributions, of £76,700 in 1995/96. In 1994/95 he received £84,000. These payments include a performance bonus for the previous year which is not awarded until after the accounts have been published. He is an ordinary member of the Principal Civil Service Pension Scheme.

(iv) The salaries, excluding pension contributions, of other higher-paid employees of Civil Service Grade 5 and above, fall into the following ranges:

Grade	1995/96 Standard Salary band £	No at 31 March 1996	1994/95 Standard Salary band £	No at 31 March 1995
3	55,000-82,500	0	49,920-59,599	1
4	46,093-55,802	1	44,390-53,740	1
5	37,400-55,802	6	36,019-53,470	9

(v) Excepting locally employed civilians, all staff are covered by the provisions of the Civil Service and Armed Forces Pension schemes. Payments are made into the Consolidated Fund at a rate determined by the Treasury. For 1995/96 there were four rates ranging from 11% to 19.5% of pay (1994/95, 13.5%).

(vi) Travel and subsistence expenditure was £1.8 million (1994/95 £1.7 million).

(vii) Early retirement costs were as follows:

	1995/96 £ million	1994/95 £ million
Expenditure incurred in current year	0.5	0.2
Expenditure to be incurred within one year	0.3	0.3
Expenditure to be incurred in later years	1.2	1.3
	<u>2.0</u>	<u>1.8</u>

The full cost of employees leaving in 1995/96 was £1.7 million (1994/95 £2.1 million).

4. Accommodation

These costs include rents utilities, maintenance charges and depreciation on buildings. In 1995/96 a provision for accrued liabilities for dilapidations on leasehold properties, including prior years' elements, has been charged against income.

5. Observations, Central Forecasting, Data Collection and Processing

These costs include equipment and material supplies, services required to collect and process data for the production of forecasts, and depreciation charges.

6. Commercial, Research and Administration

(i) These costs represent equipment, materials and services supporting the commercial, research and administration activities, notional departmental overhead charges and a notional audit fee of £40,000 (1994/95, £40,000).

(ii) Total costs of the Research and Development activities in the year were £19.8 million (1994/95 £18.6 million) including £8.8 million (1994/95 £9.6 million) funded by the DoE.

7. International subscriptions

The costs of subscriptions include the European Centre for Medium-range Weather Forecasts and the World Meteorological Organization.

8. Fixed Assets

(i) The movements in each class of assets were:

	Intangible		Tangible	
	Fixed assets £ million	Freehold land and buildings £ million	Plant and equipment £ million	Total £ million
Cost or valuation:				
At 1 April 1995	108.6	17.4	65.5	82.9
Additions	14.1	–	8.6	8.6
Finance lease adjustment	–	–	(2.6)	(2.6)
Disposals	(64.8)	–	(6.5)	(6.5)
Revaluation	1.6	(5.4)	(44.2)	(49.6)
At 31 March 1996	59.5	12.0	20.8	32.8
Depreciation:				
At 1 April 1995	64.8	2.2	26.3	28.5
Charged during year	10.4	0.5	11.3	11.8
Disposals	(64.8)	–	(4.2)	(4.2)
Revaluation	–	(2.7)	(33.4)	(36.1)
At 31 March 1996	10.4	0.0	0.0	0.0
Net book value:				
At 1 April 1995	43.8	15.2	39.2	54.4
At 31 March 1996	49.1	12.0	20.8	32.8

(ii) The net book value of freehold land and buildings includes £5.0 million of freehold land (31 March 1995 £6.0 million) which has not been depreciated.

(iii) In preparation for the move to Trading Fund status, the net book value of plant and equipment has been revalued to take account of its value to the business at 31 March 1996. This valuation is based on a valuation at 14 December 1995 carried out by professional valuers (Grimley). The permanent diminution in value of £10.8 million has been taken through the Net Expenditure Account as an exceptional item.

(iv) The net book value of plant and equipment as at 31 March 1996 includes an amount of £3.8 million (1994/95 £16.1 million) in respect of assets held under finance leases (as valued by Grimley). The depreciation charge was £6.7 million (1994/95 £6.7 million). The finance lease adjustment (£2.6 million) reflects the Office's decision not to exercise the option to purchase the leased asset.

(v) Land and buildings have been valued by the Valuation Office, in accordance with the Statements of Asset Valuation Practice in guidance notes prepared by the Royal Institution of Chartered Surveyors, on the basis of open market values for existing use, except that specialized buildings have been valued on the basis of depreciated replacement cost. The revaluation has been taken through the Revaluation Reserve.

9. Stocks

	1995/96 £ million	1994/95 £ million
Meteorological equipment	0.7	0.8
Reserve equipment	0.8	0.8
Consumable stores	0.3	0.2
	<u>1.8</u>	<u>1.8</u>

10. Debtors and Prepayments

	1995/96 £ million	1994/95 £ million
Amounts falling due within one year:		
Trade debtors	4.8	3.2
Prepayments for operating expenditure	5.5	4.6
Prepayments for capital expenditure	3.3	4.1
	<u>13.6</u>	<u>11.9</u>

11. Creditors

	1995/96 £ million	1994/95 £ million
Operating expenditure		
Amounts falling due within one year:		
Trade creditors and accruals	2.2	1.9
Early retirement costs	0.6	0.2
Deferred income	5.4	4.5
	<u>8.2</u>	<u>6.6</u>
Amounts falling due after one year:		
Early retirement costs	2.2	1.3
Dilapidations costs	0.7	—
	<u>2.9</u>	<u>1.3</u>
	<u>11.1</u>	<u>7.9</u>
Capital expenditure		
Amounts falling due within one year:		
Deferred income for capital expenditure	0.2	0.6
Obligations under finance leases	4.7	4.6
	<u>4.9</u>	<u>5.2</u>
Amounts falling due after one year:		
Obligations under finance leases	—	7.3
	<u>4.9</u>	<u>12.5</u>
Total amounts falling due within one year	<u>13.1</u>	<u>11.8</u>
Total amounts falling due after one year	<u>2.9</u>	<u>8.6</u>
	<u>16.0</u>	<u>20.4</u>

12. Provisions for liabilities and charges

	1995/96 £ million	1994/95 £ million
Reorganization provision	<u>2.2</u>	<u>—</u>

Reorganization plans have identified surplus leasehold properties. An exceptional provision of £2.2 million has been made to cover estimated future costs of specific properties, net of forecast income from sub-letting.

13. Operating leases

Annual commitments under land and building operating leases were as follows:

	1995/96 £ million	1994/95 £ million
Leases expiring within:		
Under one year	—	—
One to five years	0.2	0.5
Over five years	1.9	1.4
	<u>2.1</u>	<u>1.9</u>

14. Obligations under finance leases

(i) The maturity of these amounts is as follows:

	1995/96 £ million	1994/95 £ million
Amounts payable:		
within one year	4.9	5.1
within two to five years	—	7.4
	<u>4.9</u>	<u>12.5</u>
Less: finance charges allocated to future periods	(0.2)	(0.6)
	<u>4.7</u>	<u>11.9</u>
Analysis of changes in finance leases during the current and previous years:		
At 1 April	11.9	—
Inception of finance lease contracts	—	22.8
Capital element of finance lease rental payments	(4.6)	(10.9)
Lease extension option not exercised (see Note 8 (iv))	(2.6)	—
At 31 March	<u>4.7</u>	<u>11.9</u>

(ii) The finance charge to the Net Expenditure Account payable under finance leases was £0.4 million (1994/95 £0.9 million).

15. Capital commitments

	1995/96 £ million	1994/95 £ million
Contracted	<u>1.8</u>	<u>0.6</u>

16. Revaluation Reserve

(i) The Revaluation Reserve was set at zero on 1 April 1992 by order of the Treasury.
(ii) Movement in Year

	1995/96 £ million	1994/95 £ million
Revaluation Reserve at 1 April 1995	1.0	(1.6)
Revaluation of intangible fixed assets	1.6	1.6
Revaluation of tangible fixed assets	(2.7)	1.0
Revaluation Reserve at 31 March 1996	<u>(0.1)</u>	<u>1.0</u>

17. General Reserve

(i) The General Reserve was set at £99.2 million on 1 April 1992 by order of the Treasury.
(ii) Movement in Year

	1995/96 £ million	1994/95 £ million
General Reserve at 1 April 1995	90.5	91.8
Net cash inflow from financing	85.6	82.4
Notional charges	7.4	7.7
Less net expenditure	(104.3)	(91.4)
General Reserve at 31 March 1996	<u>79.2</u>	<u>90.5</u>

18. Financing

Payments and receipts from Defence Appropriation Accounts include net expenditure on Class 1 Vote 1 section K by the Office of £78.8 million (1994/95 £73.6 million), and payments on other sections for services and supplies by the Department on behalf of the Office. Included in Vote 1 section K is £4.6 million (1994/95 £10.9 million) for repayment of capital elements of a finance lease.

19. Statement of net assets appropriated to the Trading Fund 1 April 1996 and the Balance Sheet at 1 April 1996 following completion of initial funding

	31 March 1996	Adjustment		1 April 1996 prior to working capital loan
	£ million	£ million	Note	£ million
Fixed assets	81.9	(0.4)	(a)	81.5
Current assets	15.4	1.2	(b)	16.6
Current liabilities	(13.1)	(0.1)	(c)	(13.2)
Total assets less current liabilities	84.2	0.7		84.9
Long-term liabilities	(2.9)	(9.3)	(d)	(12.2)
Net assets	81.3	(8.6)		72.7
Funded by:				
Provision for liabilities and charges	2.2	0.9	(e)	3.1
Public dividend capital	—	58.9	(h)	58.9
Long-term loans	—	10.7	(f)	10.7
Revaluation Reserve	(0.1)	0.1	(g)	0.0
General Reserve	79.2	(79.2)	(g)	0.0
Capital Employed	81.3	(8.6)		72.7

Adjustments in arriving at the net assets appropriated to the Trading Fund comprise:

- A property transferred to MoD for disposal.
- (i) Output VAT on debtors (£0.7 million), previously accounted for on a cash basis.
(ii) Debtors transferred from MoD (£0.5 million).
- (i) Output VAT owed to HM Customs and Excise (£0.7 million) on debtors, see(b) (i) above.
(ii) Liability for early retirement transferred to MoD (£0.6 million).
- (i) Liability for early retirement transferred to MoD (£2.2 million).
(ii) Provision for deferred income in recognition of the change from a Vote-funded basis to a full accruals accounting basis as a Trading Fund (£11.5 million).
- With HM Treasury concurrence, an opening insurance provision is included.
- The balance of assets less liabilities will be funded by long-term loans from MoD.
- General and Revaluation Reserves have been eliminated with the new financing structure agreed with H M Treasury for the commencement of Trading Fund.
- In accordance with the Trading Fund order (SI1196/774), public dividend capital was set at 81% of net assets before the advance of a working capital cash loan from MoD.

On 1 April 1996 a working capital cash loan of £29.5 million was received from MoD to complete the initial funding of the Trading Fund. Following this loan the Balance Sheet at 1 April 1996 was as follows:

	£ million
Fixed assets	81.5
Current assets	
Stock	1.8
Debtors and prepayments	14.8
Bank	29.5
	<u>46.1</u>
Current liabilities	
Creditors	(13.2)
Net current assets	<u>32.9</u>
Total assets less current liabilities	114.4
Creditors due in more than one year	(12.2)
Net assets	<u>102.2</u>
Funded by:	
Provision for liabilities and charges	3.1
Public dividend capital	58.9
Long-term loans (including amounts repayable within one year — £2.6 million)	40.2
Capital employed	<u>102.2</u>

Statement of the responsibilities of the Agency and the Chief Executive

Under section 5 of the Exchequer and Audit Departments Act 1921 the Treasury have directed The Met. Office to prepare a statement of accounts for each financial year in the form and on the basis set out in the Accounts Direction on page 44.

The accounts are prepared on an accruals basis and must give a true and fair view of the Agency's state of affairs at the year end and of its income and expenditure, total recognized gains and losses and cash flows for the financial year.

In preparing the accounts the Agency is required to:

- observe the Accounts Direction issued by the Treasury, including the relevant accounting and disclosure requirements, and apply suitable accounting policies on a consistent basis;
- make judgements and estimates on a reasonable basis;
- state whether applicable accounting standards have been followed, and disclose and explain any material departures in the financial statements;
- prepare the financial statements on the going concern basis, unless it is inappropriate to presume that the Agency will continue in operation.

The Accounting Officer of the Ministry of Defence has designated the Chief Executive of The Met. Office as the Accounting Officer for the Agency. His relevant responsibilities as Accounting Officer, including responsibility for the propriety and regularity of the public finances and for the keeping of proper records, are set out in the Accounting Officer's Memorandum, issued by the Treasury and published in *Government Accounting*.

The Meteorological Office
The Certificate of the Comptroller and Auditor General to the House of Commons

I certify that I have audited the financial statements on pages 30 to 41 under the Exchequer and Audit Departments Act 1921. These financial statements have been prepared under the historical cost convention as modified by the revaluation of certain fixed assets and the accounting policies set out on pages 34 and 35.

Respective responsibilities of the Agency, the Chief Executive and Auditor

As described on page 42 the Agency and the Chief Executive are responsible for the preparation of the financial statements and for ensuring the regularity of financial transactions. It is my responsibility to form an independent opinion, based on my audit, on those statements and on the regularity of the financial transactions included in them and to report my opinion to you.

Basis of opinion

I conducted my audit in accordance with Auditing Standards issued by the Auditing Practices Board. An audit includes examination, on a test basis, of evidence relevant to the amounts, disclosures and regularity of financial transactions included in the financial statements. It also includes an assessment of the significant estimates and judgements made by the Agency and Chief Executive in the preparation of the financial statements, and of whether the accounting policies are appropriate to the Agency's circumstances, consistently applied and adequately disclosed.

I planned and performed my audit so as to obtain all the information and explanations which I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatement, whether caused by error, or by fraud or other irregularity and that, in all material respects, the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them. In forming my opinion I have also evaluated the overall adequacy of the presentation of information in the financial statements.

Opinion

In my opinion:

- the financial statements give a true and fair view of the state of affairs of The Meteorological Office Executive Agency at 31 March 1996 and of its net expenditure, total recognized gains and losses and cash flows for the year then ended and have been properly prepared in accordance with the Exchequer and Audit Departments Act 1921 and directions made thereunder by the Treasury;
- in all material respects, the expenditure and income have been applied to the purposes intended by Parliament and the financial transactions conform to the authorities which govern them.

I have no observations to make on these financial statements.

John Bourn
Comptroller and Auditor General

14 October 1996

National Audit Office
157–197 Buckingham Palace Road
Victoria
London SW1W 9SP

Accounts Direction of the Treasury

The Treasury, in pursuance of section 5(1) of the Exchequer and Audit Departments Act 1921, hereby gives the following Direction.

1. The statement of accounts which it is the duty of The Met. Office to prepare in respect of the financial year ended 31 March 1993 and in respect of any subsequent financial year shall comprise;

- (a) a foreword;
- (b) a net expenditure account;
- (c) a balance sheet;
- (d) a cash flow statement; and
- (e) (1993/94 onwards) a statement of recognized gains and losses;

including in each case such notes as may be necessary for the purposes referred to in the following paragraphs.

2. The Met. Office shall observe all relevant accounting and disclosure requirements given in *Government Accounting* and in the Treasury booklet *Trading Accounts; a Guide for Government Departments and Non-Departmental Public Bodies* (the *Trading Accounts* booklet) as amended or augmented from time to time.

3. The statement of accounts referred to above shall give a true and fair view of the income and expenditure, state of affairs and cash flow of The Met. Office. Subject to the foregoing requirement, the statement of accounts shall also, without limiting the information given and as described in Schedule 1 of this Direction, meet:

- (a) the accounting and disclosure requirements of the Companies Act;
- (b) best commercial accounting practice including accounting standards issued or adopted by the Accounting Standards Board, with the exception of the requirement contained in FRS 3 for the inclusion of a note showing historical cost profits and losses;

- (c) any disclosure and accounting requirements which the Treasury may issue from time to time in respect of accounts which are required to give a true and fair view; and
- (d) any additional disclosure requirements contained in *The Fees and Charges Guide*, in particular those relating to the need for segmental information for different services provided,

insofar as these are appropriate to The Met. Office and are in force for the financial period for which the statement of accounts is to be prepared.

4. Additional disclosure requirements are set out in Schedule 2 of this Direction.

5. The Net Expenditure Account and Balance Sheet shall be prepared under the historical cost convention modified by the inclusion of:

- (a) fixed assets at their value to the business by reference to current costs; and
- (b) stocks valued at the lower of cost, or net current replacement cost if materially different, and net realizable value.

Signed: TJ Burr
Treasury Officer of Accounts
1 July 1993

Schedule 1

Application of the Companies Act's Requirements

1. The disclosure exemptions permitted by the Companies Act in force for the financial period for which the statement of accounts is to be prepared shall not apply to The Met. Office unless specifically approved by the Treasury.
2. The foreword shall contain the information required by the Companies Act to be disclosed in the Directors' Report, to the extent that such requirements are appropriate to The Met. Office.
3. The profit and loss formats prescribed in Schedule 4 of the Companies Act shall not apply to The Met. Office's Net Expenditure Account which shall be in the form set out in the annex to this direction. Minor changes may be introduced subject to Treasury agreement.
4. In preparing its Balance Sheet, The Met. Office shall adopt format 1 prescribed in Schedule 4 to the Companies Act to the extent that such requirements are appropriate to The Met. Office. Regard should be had to the examples in Annex C of the *Trading Accounts* booklet, in particular the need to strike the Balance Sheet totals at 'total assets less current liabilities'.
5. The foreword and Balance Sheet shall be signed and dated by the Chief Executive.
6. The Met. Office prepares its accounts under the modified historical cost convention, but is exempted from providing the additional information required by paragraph 33(3) of Schedule 4 to the Companies Act.

Schedule 2

Additional Disclosure Requirements

1. The foreword shall state that the accounts have been prepared in accordance with a direction given by the Treasury in pursuance of section 5(1) of the Exchequer and Audit Departments Act 1921.
2. The foreword shall include a brief history of The Met. Office and its statutory background. Regard should be had to Annexes B and C of the *Trading Accounts* booklet.
3. The notes to the accounts shall include details of key corporate financial targets set by the Secretary of State for Defence for the year being reported on and performance achieved against those targets (when targets based on full cost accrual accounts have been set).
4. The Accounts Direction (but not the annex) shall be reproduced as an appendix to the accounts.

APPENDICES

CHARTER STANDARD FOR THE PUBLIC 1996/97

We aim to serve the public by providing the following services.

Up-to-date weather information and forecasts

We will provide weather information and forecasts through

radio and television,
newspapers, and
telephone and facsimile services.

Our performance standards are based on the accuracy of the 24-hour national forecasts broadcast at 1755 on BBC Radio 4, and a satisfaction score for our general public forecasts on BBC Television and Radio 4. The targets and our achievements against them in 1995/96 were:

	Target	Achievement
Accuracy	84.0%	84.5%
Satisfaction score	80%	84%

The targets remain unchanged for 1996/97.

Weather warnings

We will issue warnings of severe weather through

radio and television, and
emergency organizations such as the police and fire services.

We will also provide warnings of adverse road conditions

to the police, and
to local and national radio.

Our performance standard for these warning services is based on the satisfaction expressed by members of emergency organizations. For the first time in three years the target score of 80% was exceeded in 1995/96 with 82% achieved. The target remains at 80% for 1996/97.

We will provide gale warnings and marine forecasts for radio.

Our performance standards for these marine services are based on targets set for the accuracy of gale warnings. For the first time in many years neither target was achieved. This was mainly due to a difficult December and highlights the problems in forecasting for extremes. The target for success rate remains the same for 1996/97, but that for false-alarm rate has been tightened further to 17%. Both success rates and false-alarm rates are monitored, and the targets and achievements for 1995/96 are given below.

	Target	Achievement
Success rate	81%	78%
False-alarm rate	18%	20%

Advice in emergencies

We will provide warnings of coastal flooding to the Environmental Agency and the police.

Our performance standards are agreed each year with the Ministry of Agriculture, Fisheries and Food, the government department responsible for coastal flood protection and warning. Our targets are related to timeliness of issue, identification of major surges and the minimization of false alarms. All four targets were achieved in the eight months ending 30 April 1996 (few significant surges occur during the summer months). The most important target is to issue warnings to the Environmental Agency, and police forces concerned, a minimum of 12 hours in advance of a major surge. The most significant surge occurred 19–20 February 1996 and accounted for almost half the warnings issued.

We will provide weather advice for the statutory authorities in environmental pollution emergencies.

These emergencies may arise, for example, from the accidental release of toxic chemicals into the atmosphere. Our performance standard is based on the response time in providing the emergency services with specialized weather information. The newly introduced target for 1995/96 was to provide this within 30 minutes on 85% of occasions. However, in this first year a figure of only 81% was achieved. As we are committed to improving our performance for this vital service, we have increased our target in 1996/97 to 87%.

Weather and climate information

We will maintain the National Meteorological Library and Archive at Bracknell (which you may visit free of charge).

We will develop low-cost publications containing basic weather and climate information for schools and the general public.

We measure our performance by the high demand for our services. During 1995 loans to the general public and outside libraries increased by nearly 25% whilst our education section answered around 6000 enquiries.

Measuring how we are doing

Monitoring our forecasts

We continually monitor our performance. For instance we compare the forecast with what is observed and measure its accuracy. Forecasts have been steadily improving over the years and this is reflected in the performance targets set for our forecasts on radio and television and for our gale warnings.

Public surveys

We use independent consultants to make regular surveys. We welcome your comments and will react positively to them. Satisfaction scores are calculated using a scale of 1 (very dissatisfied) to 5 (very satisfied). The average value, scaled to lie between 0 and 100, is the percentage satisfaction score.

Performance targets

We have a number of performance targets in addition to those set out here. These are reviewed each year with standards set for quality of service, accuracy and increases in efficiency. We are also committed to introducing independent evaluation of performance against key corporate targets.

Finding out more

You can contact your nearest Weather Centre, or the Enquiries Officer at Bracknell.

We will be pleased to answer any questions you may have on our services, and you can ask for a brochure describing them and The Met. Office. You can also find out about our services from programme magazines, newspapers, and in telephone directories under 'Weather'. We want to hear your views and learn if you are satisfied with our services.

Should you have a complaint.

Please telephone the Enquiries Officer or, better still, write in. We aim to respond to a complaint within five working days of its receipt, or at least provide you with an acknowledgement and an estimate of when a full reply may be expected.

The Enquiries Officer, The Met. Office, London Road, Bracknell, Berkshire RG12 2SZ
Tel: 01344 420242

Weather Centres

Aberdeen	01224 210574	Leeds	0113 245 1990
Belfast	01849 422339	London	0171 242 3663
Birmingham	0121 717 0570	Manchester	0161 477 1060
Bristol	0117 927 9298	Newcastle	0191 232 6453
Cardiff	01222 397020	Norwich	01603 660779
Glasgow	0141 248 3451	Southampton	01703 228844

Most Weather Centres are open 24 hours a day, 7 days a week.
A few are closed overnight but an answerphone service is then provided.

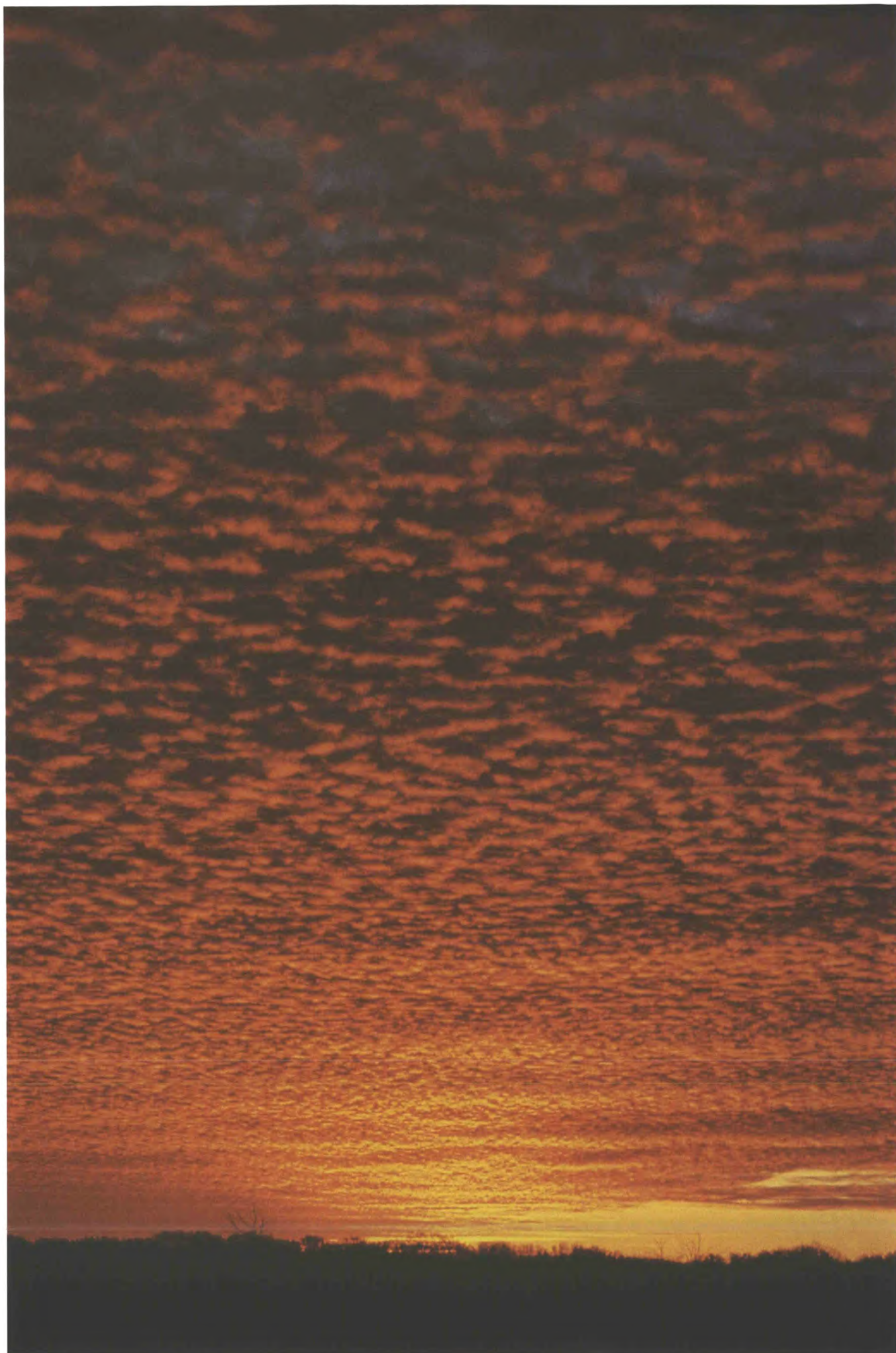
Past weather and climate information can be obtained from our Bracknell Headquarters or
Belfast Climate Office 01232 328457
Scottish Climate Office 0141 303 0110

These offices are open during normal working hours.

Information on our Library and Archive, including the loan of weather books, videos, slides, etc.,
can be obtained from the National Meteorological Library,
London Road, Bracknell, Berkshire RG12 2SZ
Tel: 01344 854841

Improving Service





Notes

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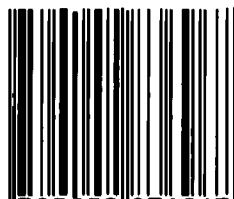
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