Executive Summary

- The Met Office is a leading science, technology, engineering and maths (STEM) organisation, with our science-based forecasts and warnings helping the public and others to protect life and property.
- Like many STEM organisations, we experience challenges in recruitment in an increasingly competitive market both locally and nationally. This is particularly apparent in our recruitment of technologists where the skills required for these roles are applicable across many sectors.
- At the same time, the specialist nature of our work in many areas can also present separate challenges in recruiting experienced staff.
- To address these challenges and develop the skills we require in staff we are increasingly turning to training schemes. Some schemes are more established than others, but all have seen benefits to both the staff involved and the organisation as a whole and are continually reviewed.
- In addition the Met Office encourages STEM students through undergraduate prizes at our academic partner universities and sponsors a number of PhD candidates through schemes such as the national CASE studentship scheme.
- To help raise awareness and increase the wider STEM skills base the Met Office also has a wide ranging and award winning STEM outreach programme which engages with both students and the professional development of teachers.

Introduction

1. The Met Office is the UK’s National Meteorological Service, a Public Sector Research Establishment and an Executive Agency of the Department for Business, Energy and Industrial Strategy. We are responsible for monitoring and predicting the weather and providing the National Severe Weather Warning Service (NSWWS) for the public, civil contingencies and emergency responders. In addition we host the Met Office Hadley Centre for Climate Science and Services, which delivers policy relevant climate advice to the UK government.

2. Science, technology, engineering and mathematics are at the core of what we do as an organisation and as such we are an employer with roles that cover the full range of subjects STEM encompasses. Based largely in the South West of England, with a smaller number of staff at offices around the country and overseas, some of the challenges we face in recruitment can be seen in a regional context and some in the broader national context. Challenges around recruitment can also be compounded by the greater flexibility of private sector organisations around remuneration. One area where we continue to see strong interest and applications is at early career stages. Therefore we are increasingly looking to training schemes as a way to harness this interest and address the challenges that we are finding in more experienced posts through development of an internal talent pipeline. Examples of these schemes, and the wider measures we are taking to help close the STEM skills gap are set out below.

Technology

3. The Met Office has a long and rich history in technology and it underpins all aspects of our work. Essential services such as the Public Weather Service, National Severe Weather Warnings Service, Civil Contingencies Services, aviation and defence services cannot be delivered without advanced and highly resilient IT infrastructure and capabilities running 24/7. Despite the international reputation and public
service application of our technology we face strong competition in the recruitment of staff in this area. The challenge has increased in recent years as many technology areas (such as HPC, large-scale storage and networks, Big Data and analytics) that were once the preserve of specialists now have mainstream demand, thus increasing competition for those skills. We see this both on a national level, but also increasingly on a local level as the number of high value opportunities in the region increases. These challenges have been particularly acute when recruiting experienced senior IT practitioners and technologists. To address this we have looked to recruit more junior staff through trainee schemes which include technical training, formal qualifications and work on softer skills and leadership. We hope this approach will foster loyalty to the organisation and enable us to grow our own technology leaders of the future.

4. Within the Technology area there are currently two separate trainee schemes. One, the industrial placement, is targeted at university students who are required to undertake a placement in industry as part of their degree course. Following an application process we take between 4 and 8 students per year and place them in a technology team for the duration of their time with us. At the end of this time we assess whether they would be suitable to return to us for a permanent position on completion of their studies. Of our eight 2016 industrial placement students, 6 were offered a conditional offer to return to the Met Office in July 2017. On returning to the Met Office these students then undertake 12 months as Graduate Trainees giving them the foundation knowledge required to become IT Practitioners.

5. The second technology based programme is the IT Trainee Scheme, which is targeted at those who display aptitude and enthusiasm, but may not hold advanced qualifications. There is no age limit on this scheme and the entry requirements are 2 A-Levels, one of which must be in maths or science. The intake is between 4 and 8 people per year and the scheme lasts for a total of 2 years. Within this period the trainees undertake 6 rotations of 4 months each – the last rotation is to undertake a project – across Technology. Presentations are required at mid-point and end of placement to help develop the trainee’s wider skills. On completion of the scheme staff remain with the Met Office and have been found to progress fairly rapidly to more senior roles. This scheme is currently under review as we look to retain the best practice, whilst also incorporating the potential for a cross Met Office learning opportunity.

Engineering

6. The Met Office provides 24/7 engineering support across a diverse range of meteorological monitoring infrastructure. At the centre of this operational capability is a range of specialist engineers who deliver work streams including the development, testing, integration and maintenance of specialist equipment. The specialist scope of our observations work means these engineering skills are challenging to find in the market and recruitment campaigns have historically yielded few engineers with applicable skill sets. Additionally we have found that where we have been able to recruit, these roles often attract candidates with a particular background and we are keen to ensure we have the widest catchment of potential candidates.

7. To address this and offer opportunities to enhance and develop the local skills base,
the Met Office has introduced a trial observations engineer apprenticeship programme. This involves using in-house knowledge, skills and experience to provide the specialist meteorological skill sets with underpinning knowledge of engineering supplied by local education partners. This model will allow the Met Office to foster loyalty to the organisation that should minimise staff churn and enhance stability in engineering teams. The approach will also facilitate passing on the bespoke knowledge held by our senior engineers ensuring business continuity through the spread of knowledge. In the future we are also looking to integrate the apprenticeship against the Institution of Engineering and Technology competencies to ensure that the learners can gain an appropriate level of professional accreditation upon the completion of training.

8. The initial cohort of apprentices was recruited in 2016 with the intention to run the scheme on a two year cycle. While a range of applicants were assessed, the apprentices successful in the initial cohort were under the age of 19 and therefore training costs are accessed from national Government funding by the training provider. The apprenticeship levy changes in 2017 will, it is hoped, further streamline this process and provide a range of learning and development opportunities for current and future staff.

9. With regard to evaluation, one additional aspect we have noted from our experience with training schemes is that while they may be targeted to address a specific skills gap, there is a risk that prospective candidates wish to use the opportunity as an initial step towards a post in a different area internally, potentially leading to a re-emergence of the original skills gap after a short period. This is one of the challenges of designing schemes so as to attract those with the skills – and the desire – to work in the specific area for a sustained period of time.

Science and Maths
10. Most of our scientific staff are employed in either our Science or Operational Meteorology professions, which each employ approximately 550 staff. Both of these professions are built of roles at different levels and have a wide range of jobs across the breadth of activities in which the Met Office works.

11. In the case of Operational Meteorology, the skills and experience required to become a qualified forecaster are highly specialised which can present a recruitment challenge, particularly given the comparatively small number of dedicated meteorology and forecasting degree courses. To ensure sufficient supply of skilled staff, the Met Office recruits from a wide range of related scientific disciplines including physics, maths and physical geography and further develops the specialist skills of new recruits in-house. The overall training programme lasts for just over a year and is a combination of an in-depth, in-house forecasting training course, supervised workplace experience and Level 5 vocational assessments. This training provides the recruits with the skills required to become an effective meteorologist and conforms to internationally recognised standards set by the World Meteorological Organisation (WMO). Demand for this course depends upon internal requirements, but in recent years has seen up to 40 trainees a year recruited.

12. The costs of this type of training range from the support of our in-house College to the amount of time qualified operational meteorologists spend supervising the
workplace experience of the trainees to those associated with ensuring our assessors meet the standards required by the external verifier. We see this as an investment in the future of our staff, but we do require trainees to work within operational meteorology for a set period of time on qualification to ensure that we see value for money from this investment.

13. In terms of the Science Profession, the Met Office Academic Partnership (MOAP) was launched in 2010 to strengthen links and collaborative working with colleagues in academia and create a cluster of weather and climate science research excellence. In addition, it allows us to actively raise awareness of careers in the Met Office with students at the participating universities of Exeter, Leeds, Reading and Oxford. This is done, in part, through providing small monetary prizes per year to each university for students and projects they select (for example ‘Best Dissertation’). This prize is accompanied by a certificate signed by the Met Office Chief Scientist.

14. More widely the Met Office raises awareness through its sponsorship of Industrial Cooperative Awards in Science and Technology (CASE studentships – formerly known as Collaborative Awards in Science and Engineering). The largest proportion of these lie within the Science Programme, which currently has 70 active CASE studentships who are at varying stages of their PhD. Since 2003 this programme has sponsored approximately 190 students and of these approximately 9% have gone on to become Met Office employees in the Science Programme. Whilst studentships currently originate from science project proposals which do not necessarily focus on specific skills gaps, we may consider this approach in the future.

STEM Outreach Programme

15. In addition to the specific work outlined above in recruitment and retention of skilled staff, the Met Office works with young people across the country to build interest in STEM careers and widen the pool of interested candidates in our schemes. This is done through our wide-ranging programme of outreach. The Met Office now has over 250 STEM Ambassadors, with around 180 of these based at our Exeter HQ, the rest are located at our Frontline stations around the UK and overseas. Staff volunteer their time and all activities undertaken feed into a corporate business performance measure thus empowering every member of staff to take part in STEM outreach activities as part of their role.

16. The aim of our programme is to engage young people in Met Office science and technology (and STEM more generally), encourage interest in STEM careers, raise awareness of the varied work of the Met Office and to share our science. The STEM programme focuses on reaching out to under-18s but we also work with teachers as part of their continuous professional development, particularly in the subjects of climate science and computer science. Many of our wider activities attract highly diverse audiences in terms of age, gender, social background and science capital. As well as the sorts of activities you might expect from a science institution – for example hands-on workshops, school visits, science festivals and careers days – some of the more innovative examples of activities delivered as part of our award-winning programme are presented below:

- **Met Office Science Camp**: A unique and popular opportunity for students aged 11-13 to camp out at one of the UK’s premier science and technology
organisations and get hands-on with our science\textsuperscript{i}. These events are always over-subscribed.

- **WOW Schools**: A project to help inspire and educate a new generation of scientists and, uniquely, use the data collected by schools to improve weather forecasts and warnings across the UK\textsuperscript{ii}.

- **Astro Challenge**: Led by the Unlimited Space Agency (UNSA), the project coincided with British European Space Agency astronaut and patron of UNSA, Tim Peake's mission to the International Space Station. The Astro Science Challenge was made up of six 'missions', each led by different institutions, including the UK Space Agency and the Royal Observatory. The Met Office's mission was based around forecasting space weather events, such as solar flares\textsuperscript{iii}.

- **Soapbox Science**: For the first time the Met Office took part in Soapbox Science in 2016. This is a novel public outreach platform for promoting women scientists and the science they do. Around 50% of Met Office STEM Ambassadors are women, and Soapbox Science gives us an opportunity to tackle some of the issues around gender balance in STEM.

### The Future

17. Many of these initiatives are in their early stages of implementation, but we are already seeing positive impacts across the Office. For these schemes to continue to deliver the skills and experience we require as an organisation, we will need to look both at the immediate gaps we face but also at the next generation and the potential skills gaps of the future. We also need to ensure that those taking part feel their skills are being appropriately used and developed. This will be addressed, in part, by ensuring regular evaluation of our skills gaps and training programmes and seeking feedback from participants to refine and develop the training solutions.

18. Whilst trainee schemes have proven to be successful in terms of the feasibility of approach and standard of skills generated, it is important to recognise that for each organisation they do require additional resources to manage and run to the required standard – while still delivering core functions. There may be opportunity to consider economies of scale whereby organisations successfully running schemes could, with appropriate funding, expand these to develop skills which are in demand in the wider economy beyond their own operations.

19. We welcome the Committee’s focus on this particular challenge facing STEM employers and look forward to its insights in this area.

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\textsuperscript{i} \url{http://www.metoffice.gov.uk/about-us/who/sustainability/community/schools/science-camps}

\textsuperscript{ii} \url{http://www.metoffice.gov.uk/learning/weather-for-schools}

\textsuperscript{iii} \url{http://unspaceagency.com/mission/the-astro-challenge/}