

**THE GEOLOGICAL SOCIETY  
THE ROYAL ASTRONOMICAL SOCIETY**

**SUBMISSION TO MIGRATION ADVISORY COMMITTEE: REVIEW OF THE  
SHORTAGE OCCUPATION LISTS FOR THE UK AND SCOTLAND AND CREATIVE  
OCCUPATIONS**

1. This submission has been produced jointly by the Geological Society of London and the Royal Astronomical Society:
  - i. The Geological Society of London (GSL) is the national learned and professional body for geoscience, with over 10,500 Fellows (members) worldwide. The Fellowship encompasses those working in industry, academia and government, with a wide range of perspectives and views on policy-relevant geoscience, and the Society is a leading communicator of this science to government bodies and other non-technical audiences.
  - ii. The Royal Astronomical Society (RAS) encourages and promotes the study of astronomy, solar-system science, geophysics and closely related branches of science. The Society represents the interests of professionals working in these fields nationally and internationally. Its more than 3500 Fellows, a third based overseas, include scientific researchers in universities, observatories and laboratories as well as historians of astronomy and others.
  - iii. The RAS and GSL jointly support the British Geophysical Association (BGA), which represents geophysicists in the UK.
2. We note that the Science Council will also make a submission to the Migration Advisory Committee's (MAC) review. Our organisations contributed to the development of that submission, and strongly support its conclusions. Our comments below should be read as supplementary to those of the Science Council. We have also discussed these issues with the Ground Forum, which brings together Learned Societies and Trade Associations representing construction-related ground engineering disciplines, spanning the geoscience and engineering sectors. The Ground Forum will make its own detailed submission in respect of these specialisms, which is consistent with ours.
3. GSL commissioned a report, delivered in June 2012, on geoscience skills needs of UK industry. We are submitting this report, including the compendium of

evidence gathered during interviews with employers, alongside these remarks. It includes a great deal of evidence relevant to the questions raised in the MAC's call for evidence. We also contacted several employers to discuss the present submission. We understand that some intend to respond to the review themselves. Comments sent to us by one company (ION GX Technology) are attached at the end of this document.

4. The call for evidence refers several times to the likely business impacts of decisions about the Shortage Occupation List (SOL). As national learned and professional bodies, our principal concerns are the likely national economic and social impacts of science skills and workforce policy, rather than solely impacts on individual companies. We are committed to playing our part, with others in our communities, in meeting these national strategic needs. But we cannot do so alone. In common with other scientific bodies, we have consistently raised with government the need to take a joined-up approach to multiple education reforms currently underway, announcements about industrial policy, and decision-making about immigration pathways. We are concerned that such a joined-up approach has not been adopted, and that this may have serious unintended consequences for the supply of trained scientists and engineers required to meet national economic and societal needs. In particular, the proposed removal of shortage occupations from the list after a fixed period (especially if this were as short as two years), predicated on the assumption that other measures will have been taken to mitigate shortage, is flawed in the absence of concerted government action to ensure the supply of sufficient trained scientists from the UK.
5. The range of data requested by the MAC, and the breadth of specialisms and types of employer within our sectors, makes it impossible for us to gather and present detailed data across the board. The June 2012 geoscience skills report commissioned by GSL in itself represented a considerable investment of time and money. We hope that the MAC has worked closely and directly with employers to understand their needs. We would be pleased to discuss with the MAC how further evidence might be gathered, and to suggest individuals and employers who might usefully be consulted.
6. The use of specific job titles to define particular areas of shortage within the Standard Occupational Classification (SOC) is understandable, but is liable to cause some confusion. There is a degree of duplication among some of the geoscience specialisms currently identified on the SOL. Furthermore, the level of specification is highly variable. For example, 'Geoscientists' are included alongside 'Hydrogeologists' and 'Engineering geomorphologists', presumably

because these have all been reported to the MAC as job titles which are sometimes associated with particular occupations where shortage is experienced. But 'geoscientist' is in fact a very broad term which includes all geologists, geophysicists, geochemists, hydrogeologists, engineering geologists, etc. In addition, some obvious job titles which are synonymous with those listed are currently omitted – for example, 'Engineering geologists'. We are not proposing that any of the job titles currently listed be removed. But the SOC does not appear to be fit for the purpose of identifying shortage occupations, because it is insufficiently granular. For as long as this remains the case, the list of specific job titles identified is likely to be somewhat arbitrary, depending on which employers, individuals and representative bodies have successfully put forward suggestions. We urge the MAC to take a thorough look at the way in which occupations are defined at a detailed level.

## **Skill**

7. In many geoscience specialisms, a taught applied MSc degree is effectively a prerequisite for entry to the profession. A three-year BSc or a four-year MSci/MGeol, regarded as a general education in geology/geoscience, is followed by a year of vocational training in a specialism such as petroleum geology, geophysics, hydrogeology, or engineering geology. This provides the essential basic specialist training on which companies can build when taking on new recruits. In some sectors, such as hydrocarbons, there are very limited opportunities for those with a BSc, MSci or MGeol only; most companies take postgraduate qualifications as their minimum entry level. In other specialisms (including geophysics, hydrogeology and engineering geology), opportunities for those without a separate MSc are also very limited and can be virtually non-existent. Our impression from conversations with those in other disciplines is that this requirement for a post-graduate degree (MSc) is especially strong in geoscience compared with most other scientific sectors.
8. It is important to note that four-year integrated undergraduate Masters degrees (such as MSci or MGeol) are not equivalent to an undergraduate degree plus a stand-alone taught applied MSc – and most importantly are not regarded as such in industry – because they do not provide the same vocational training. However, these programmes can provide students with the opportunity to acquire a broader general education in geoscience or to study an area in greater intellectual depth. They are also regarded as a good training for those wishing to go on to postgraduate research. Graduates entering geoscience specialisms in

industry therefore do so after at least four and often five years of university education.

9. In some sectors, Chartered Geologist status (or in some cases Chartered Engineer or Chartered Scientist status) is a prerequisite for professional progression and for recognition as a competent person. This typically requires at least five years of postgraduate experience and professional development.
10. The GSL report on geoscience skills needs includes evidence of industry's requirement for MSc graduates, and for those who are Chartered.
11. The BGA has just commissioned an update of its 2006 report on geophysics in higher education, a conclusion of which was that there was an inadequate supply of suitably qualified school sixth-formers into quantitative geoscience degrees to graduate as geophysicists. A small but concerted effort to address this has started with the advent, for example, of the Schools Seismology Project, but even with an immediate positive impact, projects of this kind will take up to seven years to bear fruit in terms of entry to the workforce. Whilst this shortage remains, UK industry will not be able to rely on a good domestic supply of qualified geophysicists and until then it will be essential for companies in this sector to continue to be able to recruit from further afield.

## **Shortage**

12. There are demonstrable shortages in a variety of geoscience specialisms, as shown by the GSL report on geoscience skills needs, especially of individuals with more than ten years' experience. The pattern of shortages is not straightforward, and the reasons for these shortages are complex. The report includes evidence for shortage of experienced geophysicists and geochemists in the oil and gas sector, engineering geologists and geotechnical engineers, and hydrogeologists. It should be noted that the report was not comprehensive, as it was not feasible to include all sectors of UK industry in which geoscientists are employed, so it may not have identified all areas of serious shortage.
13. There is widespread concern in industry that the future supply of MSc graduates is threatened by the withdrawal of government funding for MSc studentships, the increase in undergraduate student fees (meaning that those who might enter MSc programmes would do so with much greater levels of existing debt than previously), and the fact that Masters students do not have access to the student loan system or any other affordable source of credit. As noted by the Higher

Education Commission's recent report on Postgraduate Education, this is likely to have a serious negative impact on access to MSc courses among all but the most well-off students. Furthermore, many MSc programmes (and even some departments) face the threat of closure. This is of particular concern in the geoscience sector, where taught applied Masters courses are particularly valued.

### **Sensible**

14. As noted above, our organisations have highlighted the need to ensure that suitable pre-employment training (undergraduate and postgraduate degree programmes) is sustained, and have been active in communicating this need to government. We have also pointed out above that training at and after university takes many years.
15. We recognise that the present consultation refers to the SOL, not to intra-company transfers. However, it is important that these aspects of immigration policy are not looked at in isolation. International oil companies, many of which are major employers in the UK, rely on mobility of skilled and senior personnel, according to the needs of current projects worldwide. Anecdotal evidence indicates that current UK immigration regulations are impeding this mobility. This will make global companies more likely to move existing operations outside the UK, and to invest in new projects overseas rather than in the UK, reducing employment opportunities for UK citizens.

### **Sunset clause**

16. We support the comments made by the Science Council regarding the proposed sunset clause. Although some mitigating actions can be taken by employers, others depend on government. The particular need for MSc graduates in many geoscience sectors, and the length of time taken to train fully qualified professionals, makes a cut-off period of two years especially problematic. Even if government takes action now to ensure sustained or increased supply of MSc graduates, it will take several years for the benefit to be felt in the labour market. In the absence of joined-up skills planning across government – through the DfE, BIS and delivery departments such as DECC, whose future work programmes will require many highly trained science and engineering specialists – the arbitrary removal from the SOL of occupations in which there are demonstrable shortages is a short-sighted approach which is likely to be deleterious to national economic and societal needs.

## **Concluding remarks**

17. We would be pleased to discuss further any of the issues raised in this submission.

## **Further information**

Geophysics in the UK (2006)

[https://www.ras.org.uk/images/stories/ras\\_pdfs/Geophysics%20Education%20in%20the%20UK%20%2812b%29.pdf](https://www.ras.org.uk/images/stories/ras_pdfs/Geophysics%20Education%20in%20the%20UK%20%2812b%29.pdf)

Geoscience skills needs of UK industry (2012) (prepared for the Geological Society of London by TBR – copy attached).

30 November 2012

***Annex: comments from Dr Ian Jones, ION GX Technology:***

To whom it may concern

RE: employment of non-EU nationals in the geoscience service industry.

ION GX Technology is one of the main service providers for high-fidelity complex imaging worldwide, our products (3D digital images of the Earth's subsurface) being used by oil company geologists to locate hydrocarbon reserves.

We routinely recruit new graduates, primarily with MSc and PhD degrees from those UK universities (primarily Leeds, Imperial, and Southampton), who produce highly qualified graduates specialising in our field, as well as from some other EU universities.

Given the lack of strategic guidance in the UK for high school curricula to encourage students to become more numerate and follow a technical science and engineering career path, we routinely face the problem of being unable to find a sufficient number of high quality graduates each year (over the past years, GXT alone has typically recruited between 6-10 new hires each year for our London data-processing centre).

With these observations in-mind, we would encourage the UK Government to consider relaxing the restrictions on employment opportunities for highly qualified graduates, specifically those with MSc's and PhD's in the geosciences.

Regards

Dr. Ian F. Jones

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ION - GXT Imaging Solutions

*(version on headed paper also supplied as a PDF)*