

Health and Safety Executive Board Paper

Meeting Date:	5 th May 2004	Open Gov. Status:	Open
Type of Paper:		Paper File Ref:	Above the Line
Exemptions:	No		

HSE BOARD PAPER

FUTURE SCIENCE AND TECHNOLOGY RESOURCE REQUIREMENTS

A Paper by Paul Davies

Advisor(s): Brian Fullam, Moira Wilson and Julian Delic

Cleared by Justin McCracken on 21/04/2004

ISSUE

1. The science and technology staff resource needed to deliver the new HSC/E strategy.

This is an early paper seeking a high level steer from the Board on the direction of change in the provision of S&T resource needed to support the delivery of HSC/E's Strategy. Further work, involving input from the Directorates and Strategic Programme Directors, will be needed to implement options and identify and manage the associated business risks

TIMING

2. Prompt decisions are needed to allow work to be done to ensure optimal use of S&T resources to implement the HSC/E strategy. The decisions will also inform the OST audit of HSE's S&I functions starting in June.

RECOMMENDATION

3. The board agrees or amends the actions summarised in Annex 1, gives its views on the principle of pooling topic specialist resource and gives a steer on the arrangements for future delivery of Corporate Topic Group functions (Para 31).

BACKGROUND

4. The original objective of the Science and Technology (S&T) Review was to establish – in broad terms – the resources needed by HSE for the next 5-10 years and to identify options to move to that position.

5. The subsequent development of thinking behind the emerging HSC/E Strategy to 2010, and in particular the principle of delivering the Strategy through a small number of Strategic Programmes, made it appropriate to broaden the scope of the review. This increased its value because it allowed more radical ways of resourcing S&T needs to be considered. However it also made the review more difficult because both the new arrangements for programme working and the content of some of the Strategic Programmes are fairly embryonic.

6. A workshop was held in March for SCS members from all directorates representing the users and suppliers of S&T resource, including HSL. There were also inputs from RPD from representatives of PEF, PD and BSD. The workshop considered a range of key issues relating to HSE's future S&T needs in the context of extensive information about current S&T resources and ways of working. The workshop strongly reinforced the view that S&T input is critical to the successful delivery of the HSC/E strategy. The key messages from the workshop are summarised in Annex 2.

HSC/E STRATEGY AND ALLOCATION OF S&T RESOURCES

7. There are approximately 1000 S&T specialists¹ in HSE (including HSL), which is 24% of HSE's total staff. They cover a wide variety of disciplines including scientific, engineering, medical and industry specialisms (Annex 4 - Diagram 2). Virtually all specialists are in the Operating Directorates (OD), COSAS and HSL (Annex 4 – Diagram 1). The table in Annex 3 describes the S&T outputs, customers and deliverers.

8. Some disciplines are dispersed across a number of directorates working independently to achieve specific divisional objectives, some of which may contribute to strategic programmes. The directorate focus and to some extent directorate cultures discourage flexible use of this resource to meet the priority needs of strategic programmes.

9. From an S&T perspective HSE can be defined by a broad “business model” of two business groups and core consisting of: the Major Hazards Programme; the other Strategic Programmes; and Core (Annex 5) consisting of two elements Proactive and Mandatory. Mandatory Core, the work that HSE has to do to meet its statutory obligations e.g. running statutory schemes, accident and incident investigation, underpins the strategic programmes. Proactive core consists of cross cutting work supporting HSE's business e.g. horizon scanning, knowledge management, development of guidance and standards.

10. The broad business model was agreed at the workshop as a pragmatic way of describing different S&T needs and different ways of working. This model, together

¹ *These are individuals who actively use their scientific, engineering and medical skills in their work for HSE. It includes most staff on premium pay, and staff who have scientific engineering or health specialisms, which do not attract premium pay.*

with a broad picture of the current allocation of S&T resource and a possible future model are shown in Annex 5. The workshop agreed that the current allocation of S&T resource to proactive core was reasonable and it agreed the need to provide additional S&T resource into Strategic Programmes.

ECONOMY IN THE USE OF S&T RESOURCE

Argument

11. The central question is whether the current amount of S&T resource is too much, too little or about right. Currently:

- Over 70% of in-house S&T resources staff are involved in frontline delivery
- 57% of the S&T resource is the prime deliverer of the Major Hazard Strategic Programme (mainly safety)
- 12% of S&T resource delivers mandatory core work (HSL is significantly higher at 40%)
- 11% of S&T resource delivers proactive core work

12. At approximately 25% of the HSE's total there is no case for any increase in S&T resource but this proportion needs to be maintained if HSC/E is to deliver its strategic priorities and programmes. However in the face of substantial future budget pressure there is a need to find ways of reducing the total amount of S&T resource over the SR2004 period by:

- Bearing down on the amount of cross-cutting and sector based proactive core work (e.g. methodology and standards development work);
- Reducing the S&T input needed to achieve the same impact and meet statutory obligations (this will require process re-engineering).

In the medium term, losses through retirement of 20% of S&T resource provide an opportunity to reduce total numbers should budgetary pressures require this, but could critically expose some sectors or groups e.g. NSD, EMAS, FOD SGs.

Options and actions

13. In principle it is possible to reduce the amount of proactive core S&T resource (level 3 – CTGs, HSL and S&T programme money) without serious effects in the short to medium term and to redirect the released resources to work that contribute directly to the delivery of the Strategic Programmes. However this will reduce our capacity to do longer term horizon scanning, methodology development and generic standard setting. It is also likely to lead to a reduction in demands on HSL resource, which may not easily be redirected to front line delivery. Similarly some sector S&T resource (level2) could be released for front line assessment and inspection work by

reducing the resources put into sector standards development and guidance. This may have a more immediate impact on the Strategic Programmes.

Action targets

- i) Reduce CTG proactive core work up to 20% by April 2005 and redirect resource to delivery of strategic programmes. This reduction, which amounts to 10 staff years, is an overall target across the CTGs. Changes in each CTG would be agreed between the Chief Scientist and the Director of the CTG's Home Directorate**
- ii) Directors to review plans for work on sector standards and guidance with a view to reducing the S&T resources involved in this work (a mixture of admin and programme expenditure) by 20% in 2005/6. The baseline will be the 2003/4 (August 2003) level.**
- iii) All proactive core work to be done under a formal customer-contractor relationship, where the customer is either a Strategic Programme Director (SPD) or the Chief Scientist (CS).**

14. In the major hazards directorates (MHD) some reductions in the number of S&T topic specialist inspectors (and also sector specialist inspectors) could be achieved by improving the business model by:

- a. Reviewing and re-engineering the assessment and inspection processes to optimise the requirement for specialist inspector input (e.g. by greater codification of specialist knowledge and advice).
- b. Changing the role HSE plays in providing public assurance

Action Target

- iv) A study is done to identify what is required to provide the necessary level of public assurance for the major hazard sectors, the role HSE should play in this and the S&T resource required to fulfil this role. This review would be completed by October 2004 and led by the MH SPD.**
- v) A second study would use the outcomes to review the breadth and depth of specialist involvement in the assessment and inspection processes of the MHD. Review to be completed by April 2005.**

15. FOD (and hence the non major hazards strategic programmes) already has a high non-specialist to specialist inspector ratio (7:1). Therefore further process re-engineering and codification of specialist knowledge is unlikely to lead to a significant reduction in the demands for specialist inspector support. About half of FOD's

specialist inspector resource is consumed in investigating serious incidences and cases of ill health (mandatory core). The indications from the “new model FOD” pilot are that introduction of the model will not yield any reduction in demand.

16. The LA partnership programme will probably lead to a significant increase in demand for S&T specialist inspector support to the LAs, as much of this will need to be provided by the RSG. Overall the demands on FOD’s specialist inspector resource will increase. Meeting all these demands within existing FOD resource levels would not be achievable, even with process improvement. However, it is questionable whether HSE should agree to meet all of these additional costs. A more realistic alternative is for FOD to meet a proportion of the demand from existing resources, an efficiency saving, and for the LAs to pay for the remainder by funding additional posts or buying in support from HSL.

17. Although no overall right mix has been determined, a clear need was identified for FOD to increase its human factors specialists (see HSE board paper B/04/004) to deliver all Strategic Programmes. To achieve this within existing resource levels FOD will have to adjust its specialist mix to increase its human factors expertise and reduce posts in other specialisms.

Action target

- vi) FOD and the non-major hazard strategic programmes to maintain current S&T resource levels over the SR2004 period.

EFFICIENT ORGANISATION AND USE OF S&T RESOURCE

18. There are two main constraints on achieving a more flexible and efficient use of S&T resource:

- Diversity in business models and directorate cultures;
- Organisational complexity.

Diversity in business models and directorate cultures

19. Broadly speaking there are two types of specialist inspector in HSE:

- **Sector specialists** e.g. rail, mines, explosives and offshore inspectors.
- **Topic specialists** e.g. doctors, civil engineers and mechanical engineers. Within this group there is a further subdivision between **broad topic specialists** (e.g. process safety) and **deep topic specialists** (e.g. marine architects and wells engineers).

20. In principal the most efficient (but arguably not the most effective) use of specialist inspectors would come from:

- a. Creating large pools of broad topic specialists who deliver their input into each of the ODs and strategic programmes on a customer – contractor basis;
- b. Reducing the number of deep topic specialists to the minimum to cope with the base-load of work (or perhaps even less than the base load) and entering into strategic partnerships with external contractors to provide additional specialist input on demand;
- c. Distinguishing more clearly between the competencies required by deep topic specialists, broad topic specialists, sector specialists and general inspectors so that specialists are only required to do the work that needs their specialist knowledge, skills and experience.

21. The main barriers to achieving improvements in efficiency via these routes are:

- a. Each OD largely operates as a separate self-contained business, which recruits, develops and deploys specialist staff solely to meet their business needs – often based on meeting peak demand;
- b. Each OD has substantially different cultures, business processes and ways of doing things - even where they are undertaking broadly similar functions e.g. permissioning in the MHD;
- c. The need for broad topic experts to be familiar with the environment as well as the technology and technical standards applicable in different industry sectors (e.g. pressure vessels in the nuclear industry compared to those in the chemical industry);
- d. The availability, effectiveness and cost of external contractors providing deep specialist expertise. Also the high management and overhead costs of familiarising external experts with HSE's processes. Consensus exists across HSE that external contractors are of limited use in formal enforcement because of their lack of competence on the requirements of evidence.
- e. Premium pay and the need to maintain income levels;
- f. Geography – need to be located in reasonable travelling distance of duty holders. But it is possible to have geographically dispersed pools.

Options and actions

22. For the foreseeable future it is reasonable to conclude – from an S&T perspective – that we will retain two separate business groups:

- a. MHDs - major hazards strategic programme;
- b. FOD/LAs - the non-major hazard strategic programmes.

23. FOD already operates largely as per the arrangements described in Para 15. The regional support groups (RSG) provide the entire specialist occupational health inspector input needed by the major hazard directorates (except HID). The RSG process safety specialists also do work for HID – CID where the technical issues are frequently more challenging and provide them with better opportunities to maintain and develop their expertise.

24. A move to pooling S&T resource would involve radical restructuring. It is therefore not feasible to move quickly to a position where all broad topic specialists are organised into common pools, which serve the level 1, 2 and 3 needs of all the directorates and strategic programmes. However this could be regarded as an aspirational goal with an intermediate stage with two pools reflecting the business model. The following actions could be taken to work towards this goal:

Actions

- vii) A cross directorate project led by the Chief Scientist to specify the competencies (knowledge, skills and experience) needed by sector specialists, broad topic specialists and deep topic specialists (October 2004).**
- viii) A project is undertaken under the auspices of OMF to review and re-engineer the business processes in MHD so that they are as similar as possible, and to ensure that deep topic, broad topic and sector specialists undertake work that only they can do.**
- ix) Agree to the objective of having all topic specialists organised in common pools by April 2007.**
- x) A review identifying models for proposed organisational pools. In parallel pilot studies should be undertaken over the next 12 months to test the feasibility of the broad topic specialist pool model. Possible candidates are:**
 - HID pooling one or more of its broad topic specialisms (e.g. fire and explosion, control and instrumentation) and providing resources from that pool to all of its divisions. The process safety specialists in FOD RSG should transfer to HID which should then take responsibility for providing all process safety support to FOD and the non major hazard programmes (August 2004);

- As above where the customers for the resource pool to be extended to include one or more divisions in FOD, a division in NSD and a division in RI. The candidate broad topic specialism should be relatively narrow e.g. control and instrumentation.
- The human factors team being set up in HID should serve all the operating directorates. HF specialists in NSD and RI should transfer to this group (August 2004).
- All Occupational Hygiene support to be provided by FOD by August 2004. The specialist team in HID should transfer to FOD;
- Creating topic pools in noise and vibration, and radiation.
- As the Major Hazard Strategic Programme develops cross cutting issues these should be selected for implementation in all the MHDs by single project teams.

25. The peaks and troughs of workflow and the risks that there may be no long term need for particular types of deep topic expertise suggest we should reduce our reliance on this mode of resource provision and buy more of this type of expertise in on demand. However, the incentive to do so is small and this change will only happen if it is imposed.

Action

- xi) For a trial period of up to 2 years each MHD should purchase external expertise as an alternative to filling any vacancies arising in their deep topic specialists. (Trial to commence April 2005)**

Organisational complexity

Argument

26. Annex 5 outlines the principal customers and providers for the three main types of S&T “outputs”. The table illustrates the complexity of current arrangements, which can lead to overlaps and duplication through a lack of clarity about who is doing what and for what purpose. Currently these inefficiencies are mitigated by consultation across the organisation – much of it informal.

27. Arguably the organisation of S&T would be simplified and made more efficient by dispensing with the CTGs or by bringing them together and making the delivery of their proactive core functions part of the responsibility of single command.

28. It would be imprudent to stop all the corporate S&T work done by the CTGs. Also these groups act as advisors to SPDs (at least in the non-major hazard programmes) on the contribution that S&T can make to the programme objectives

and assist the SPD in negotiations to provide these contributions. These functions need to continue.

29. Another cause of complexity/confusion leading to inefficiency is lack of clarity within HSE between the roles of HSE's "in-house" specialists and that of the scientists at HSL. This has been compounded by the use of HSL to fulfil quasi-specialist inspector functions when there have been difficulties in recruiting specialist inspectors.

30. The other substantial area of overlap and duplication is the boundary between work done to produce crosscutting or generic good practice standards (level 3 CTG work) and work on sector targeted standards/guidance on the same issue (level 2 work). For example there is considerable overlap between HSE's general guidance of cranes and recent guidance on the safe operation of cranes offshore.

Options and actions

31. There are four main options for rationalising the organisation of the CTG crosscutting proactive core functions:

- i) **Maintain the status quo: There is no single model for a CTG and most deliver a varying and interdependent mix of level 1, 2 and 3 work; ranging from delivery only of a statutory scheme through to most work being delivery at level 1 and 2 straight into priority programmes.**

Advantages

- The diversity of approach would be maintained
- Maintains a critical mass of specialists in some disciplines e.g. noise and vibration, radiation
- ODD's maintain the link to CTGs, which is particularly important when the total cadre of specialists in a topic group is small (critical mass) or when trying to develop a new topic group e.g. human factors.
- Minimal change and therefore minimal disruption and cost
- Maintains flexibility – staff in CTG deliver level 1,2,3 work according to demands.
- Maintains the continuity of earlier decisions by the Board and permits a more evolutionary approach to change in the CTGs.

Disadvantages

- CTGs can be slow to respond to change.
- Regrouping or redistribution of resources is more difficult to manage.

ii) Transfer the function to HSL. (The delivery of sector and front-line functions and statutory schemes would remain in operational directorates)

Advantages

- Simplicity – all level 3 work done in one part of the organisation;
- Able to capitalise on HSL's marketing culture and experience;
- Equity of access to both policy and operations groups;
- Efficiency gains by broadening the skill base of HSL staff so that they are better equipped to make regulatory judgements;
- Utilise available space in the new building at Buxton;
- Eases the management of critical mass in smaller disciplines.

Disadvantages

- Alters the role of HSL and moves it further away from being a “bench-research” based organisation (implications for the review of HSL's constitution). There was no support in the SCS workshop for altering HSL's role;
- Changes the nature of the intelligent customer that is available to policy group. It will no longer be able to provide the same blend of technical and regulatory expertise as current CTGs;
- Budgetary complexities to sort out;
- Some CTGs (e.g. Biological Agents) have substantial primary inspection and enforcement functions with strong internal synergies between level 1, 2 and 3 work. All of these functions would probably need to transfer to HSL;
- Breaks the link with ODD which was a key reason for locating CTGs where they are now;
- PTE costs.
- Need to find operational owners for statutory schemes and staff delivering level 1 and 2 work.
- Will generate conflicts of interest between customer (CTG) and supplier (HSL) role for level 3 work and commissioned research. Will require redevelopment of current customer contractor relationship between HSE and HSL.

iii) Consolidate the functions in CoSAS (The delivery of sector and front-line functions and statutory schemes would remain in operational directorates)

Advantages

- Little disruption and cost;
- Central focus for level 3 work with CoSAS managing the re-allocation to HSL as appropriate;

Disadvantages

- Difficult for Chief Scientist to exercise (self) challenge role on the need for level 3 work to be done;
- Weakens links with D/Ds, which is particularly important when the total cadre of specialists in a topic group is small (critical mass) or when trying to develop a new topic group e.g. human factors.
- Need to find operational owners for statutory schemes and staff delivering level 1 and 2 work

- iv) **Consolidate the functions into topic pools (see Para 27 and 30 below): Which would take responsibility for managing the provision of levels 1, 2 and 3 S&T input across all of HSE, including acting as the technical customer for work done by HSL.**

Advantages

- Minimise S&T interfaces and provide a one-stop shop for all S&T customers
- Easier to provide flexible delivery and management of a single resource pool

Disadvantages

- The pools do not yet exist
- Would need to change organisational culture so that these pools become providers of resource, with programmes bidding/buying the resource from the pools
- The organisation would need to develop structures to encompass the pools. Control of the resources would move away from operating directorates.
- Systems and arrangements would need to be developed to support more flexible movement across the organisation and more flexible use of staff

32. Option (iv) (consolidation into topic pools) is unlikely to be feasible in the short term except for small groups, which are already at critical mass e.g. noise and vibration and radiation. Option (iii) (location in CoSAS) causes little disruption and is

the lowest risk option that preserves the opportunity to move to option (iv) in due course. But it may not achieve the simplicity and improvement in efficiency obtainable through option (ii) (transfer to HSL). Option (i) (no change) carries with it the least cost and disruption but is also the least likely to achieve the transfer of resource to the delivery of strategic programmes.

Action

- xii) The Board is invited to comment on these options and provide a steer on which one should be pursued and how quickly.**

- xiii) If the Board choose options (ii) or (iii) the Chief Scientist should prepare a “specification note” describing and distinguishing the work that HSL should do and that which should be done by in-house specialists. Deviations from this specification should only be allowed in exceptional circumstances and with the agreement of the Chief Scientist, the Chief Executive of HSL and the Chief Finance Officer. (July 2004)**

- xiv) The Chief Scientist should prepare a protocol for making decisions about the allocation of S&T resources for the production of generic or sector specific good practice standards/guidance (July 2004).**

CONSULTATION

33. There has been consultation with HSE board members, the Chief Executive of HSL and the heads of the CTG's. There has been no other consultation with members of the S&T community. The Trades Unions have been given a confidential briefing, Once the Board has made its decision the S&T community need to be informed as a matter of urgency and should then be involved in developing and delivering the resulting programme of change.

PRESENTATION

34. This study is of considerable interest to the internal S&T community. Trade Unions have asked to discuss the outcomes of this meeting. A note summarising the key messages emerging from the workshop has been circulated. Early communication from the HSE board is desirable and it is recommended that a message be issued which builds on the earlier note issued after the SCS workshop and incorporates the conclusions of today's discussions. This would be followed by a series of meetings with S&T staff where the decisions will be presented. The agreed strategy to meet HSE's future S&T resource requirements will be published as an integral part of the new HSC/E Science and Innovation Strategy.