

# Outline Business Case for the Central Campus Critical Care Unit

## Purpose of this Document

The purpose of this document is to explain the rationale for investing in a new Critical Care Unit located on the Central Campus at RHH.

## VERSION CONTROL

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## Table of Contents

1	EXECUTIVE SUMMARY .....	5
1.1	General.....	5
1.2	Rationale .....	5
1.3	Preferred Solution .....	5
1.4	Expected Benefits .....	6
1.5	Estimated Costs .....	6
1.6	Recommendations .....	7
2	INTRODUCTION.....	9
2.1	General.....	9
2.2	Background .....	9
3	STRATEGIC CASE .....	10
3.1	General.....	10
3.2	R Floor, RHH.....	10
3.3	N Floor, RHH.....	10
3.4	Cardiology, RHH .....	10
3.5	Health & Safety .....	10
3.6	European Working Time Directive (EWTD) .....	11
3.7	Sheffield Clinical Skills Unit, RHH .....	12
3.8	Activity Analysis.....	12
3.9	POSU (now SHDU), A Floor, RHH .....	13
3.10	Potential Size of the Proposed New Unit .....	15
3.11	Key Investment Objectives.....	18
3.12	Expected Benefits .....	18
3.13	Fit with Trust Objectives .....	18
3.14	Summary .....	19
4	ECONOMIC CASE.....	20
4.1	General.....	20
4.2	Option 1 – Continue with Current Approach .....	20
4.3	Option 2 – Use B Floor Podium West .....	20
4.4	Option 3 – Use Wards M1 & M2 .....	20
4.5	Option 4 – Use Wards Q1, Q2, Q3 & Q4 .....	21
4.6	Option 5 – Use Wards N1 & N2 .....	21
4.7	Option 6 – Use Wards K1 & K2.....	21
4.8	Evaluation Criteria .....	22
4.9	Preferred Solution .....	24
4.10	Benefit Points .....	24
4.11	Timetable.....	25

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4.12	Summary .....	25
5	FINANCIAL CASE.....	26
5.1	General.....	26
5.2	Asset Life.....	26
5.3	Outline Plan.....	26
5.4	Key Principles.....	26
5.5	Key Operational Differences .....	27
5.6	Capital Costs .....	27
5.7	Ward Refurbishment Plan .....	29
5.8	GE Patient Monitors .....	29
5.9	Further Observations On Capital Costs .....	29
5.10	Non-Recurrent Revenue Costs .....	29
5.11	Incremental Recurrent Revenue Costs .....	30
5.12	Outstanding Issue Concerning Post-Reconfiguration Budgets.....	31
5.13	Activity Levels At NGH Critical Care Unit.....	31
5.14	Incremental Cost Savings .....	32
5.15	Tariff Issues.....	33
5.16	Additional Incremental Income.....	34
5.17	Affordability.....	35
5.18	Financial Appraisal.....	35
5.19	Sensitivity Analysis.....	36
5.20	Preferred Solution .....	38
5.21	Risk Analysis .....	38
5.22	Commissioner Support.....	40
5.23	Optional Additional Investments.....	40
5.24	Summary .....	41
6	COMMERCIAL CASE .....	42
7	MANAGEMENT CASE.....	43
7.1	General.....	43
7.2	Capital Budget Holder .....	43
7.3	Project Methodology.....	43
7.4	Programme Board .....	43
7.5	Project Board.....	43
7.6	Project Lead .....	43
7.7	Project Manager (Design & Construction).....	43
7.8	Project Manager (Implementation).....	43
7.9	Project Teams .....	44
7.10	Benefits Realisation.....	44
7.11	Post-Implementation Review.....	44

7.12	Summary .....	44
8	CONCLUSION .....	45

## Figures

Figure 1 – Central Campus Critical Care Bed Summary .....	16
Figure 2 – Central Campus General Critical Care Beds .....	17
Figure 3 – Benefit Criteria .....	22
Figure 4 – Weighting of Benefit Criteria .....	23
Figure 5 – Scoring of Options .....	23
Figure 6 – Benefit Points.....	24
Figure 7 – Timetable for Preferred Solution.....	25
Figure 8 - Capital Costs For K Floor Scheme (29 beds).....	27
Figure 9 – Incremental Recurrent Revenue Costs .....	30
Figure 10 – Incremental Cost Savings.....	32
Figure 11 – Additional Incremental Income .....	34
Figure 12 – Affordability of Incremental Revenue Consequences.....	35
Figure 13 – Appraisal Summary .....	36
Figure 14 – Sensitivity Analysis .....	36
Figure 15 – Risk Analysis.....	39

## Appendices

Appendix A – Activity Table .....	47
Appendix B – Activity Run Chart.....	48
Appendix C – Outline Implementation Plan .....	49
Appendix D – Optional Additional Investment: MetaVision.....	51
Appendix E – Optional Additional Investment: Pharmacy .....	58
Appendix F – Detailed Neurosciences Incremental Revenue Costs .....	61
Appendix G – Detailed OSCCA Cost Savings.....	64
Appendix H – Detailed Support Costings.....	67
Appendix I – Project Organisational Structure .....	73

# 1 EXECUTIVE SUMMARY

## 1.1 General

- 1.1.1 This OBC explains the rationale for investing in a new Critical Care Unit at the Central Campus.
- 1.1.2 This scheme is an essential component of the Service Reconfiguration Programme. The urgency surrounding the latter means that the building works may need to be fast-tracked, whilst other aspects of the scheme continue to be refined in the months ahead.

## 1.2 Rationale

- 1.2.1 There are numerous reasons why a new critical care unit is needed at RHH.
- 1.2.2 A number of clinical services have now transferred to NGH as part of service reconfiguration. This being so, the existing critical care facility on R Floor of RHH has ceased to be viable as a stand-alone unit, because the general Level 3 critical care activity requires (on average) only 2.3 beds, assuming 85% occupancy. This is too few to be sustainable in situ.
- 1.2.3 Conversely, the Neurosciences Directorate requires an expansion in critical care capacity (N1) in order to meet its current and predicted workload. The available floorspace on N Floor at RHH cannot be extended any further without a major rebuild. Although interim arrangements have already been made, a permanent solution is necessary in order to avoid perpetuating the current situation whereby the Neurosciences Directorate is unable to accept all referrals from surrounding DGHs within the region.
- 1.2.4 A further consequence of reconfiguration is the need to ensure continued provision of appropriate facilities for patients requiring Level 2 cardiological support. Although these patients are few in number, it is essential not to lose sight of their needs.
- 1.2.5 Another driver for change is the present non-compliance with certain regulatory requirements for health & safety. There have been long-standing concerns for many years about the status of R and N Floors in terms of meeting these requirements, and therefore a new unit would facilitate improvements in these areas. Likewise, the opportunities offered by a new unit to re-design workflow would also improve compliance with EWTD.
- 1.2.6 Finally, there is a requirement to vacate R Floor in order to create the planned Sheffield Clinical Skills Unit by March 2011 at the latest. The SHA has allocated funds for this scheme, which will be lost if implementation is not achieved on schedule.

## 1.3 Preferred Solution

- 1.3.1 An option appraisal has been conducted, from which K Floor has strongly emerged as the preferred location for the new unit.
- 1.3.2 Provided that the building works are authorised to begin in February 2011, the new unit would be operational from 12 December 2011 onwards.
- 1.3.3 This timetable is important because it will bring to an end the Trust's reliance on temporary critical care arrangements at RHH, and thus ensure the continued support of key stakeholders for the service reconfiguration programme.

- 1.3.4 Given the Trust's existing directorate structure, both components of the new Central Campus Critical Care Unit (ie those belonging to OSCCA and Neurosciences respectively) will be financially and managerially separate. However, co-operation between directorates will ensure best practice for all patients and maximise the efficient use of available beds at times of operational pressure.

## 1.4 Expected Benefits

- 1.4.1 This scheme is about re-providing an existing service in a way which achieves essential improvements in the quality of service for patients.

- 1.4.2 The proposed new unit will:

- Provide adequate capacity and appropriate critical care facilities for the Central Campus.
- Allow essential expansion of Neurosciences.
- Achieve a major milestone in support of the service reconfiguration programme.
- Achieve much closer compliance with Health Building Note (HBN) 57, for example, regarding medical gas pipeline systems, infection control, estates fire code, etc.
- Enable progress towards compliance with EWTD.
- Enable the Trust to maintain recognised critical care training for both basic and advanced trainees.
- Free up space on A Floor for future developments.
- Vacate R Floor, thus facilitating the Clinical Skills Project.

## 1.5 Estimated Costs

- 1.5.1 At OBC stage, the estimated costs are as follows:

- Capital Costs: £7.7m.
- Non-Recurrent Revenue Costs: Nil.
- Incremental Recurrent Revenue Costs (including capital charges): £402k.

- 1.5.2 The latter figure is the net balance (worst case) after cost savings and additional income have been taken into account. There is currently no funding for these revenue costs. However, if capital charges (£629k) could be taken out of the equation, the scheme would be revenue-positive.

- 1.5.3 The advent of the proposed new unit coincides with forthcoming national tariff changes. Hence the STH Contracting Team has been closely involved with the preparation of this business case and will begin negotiating the contractual arrangements for critical care services (including this new unit) with commissioners in mid-November 2010. It is anticipated that these discussions will be extremely difficult in the current financial climate. They are unlikely to be concluded until March 2011 at the earliest, in which case there may be an issue about whether the Trust proceeds at risk.

- 1.5.4 In order to minimise this risk, it is recommended that the proposed new unit should open with staffing for only 26 beds but be equipped for 29 beds (which is the maximum number that the physical infrastructure is capable of accommodating).



1.5.5 Certain historical differences exist between general critical care and neurosciences which need to be addressed, as explained next. General critical care has historically been better equipped than neuro critical care. Therefore in order to enable both parties to work as a single coherent clinical unit, it is strongly recommended (in principle) that optional additional capital and revenue investments are made in order to bring the Neurosciences beds up to the same standard as the general critical care beds by equipping them with (1) the MetaVision clinical information system, and (2) an improved pharmacy service. The additional costs - which represent significant improvements in clinical quality and patient care but are currently unfunded - are shown below:

- **MetaVision.**
  - Capital Costs: £226k.
  - Non-Recurrent Revenue Costs: £67k.
  - Incremental Recurrent Revenue Costs (including capital charges): £145k.
- **Pharmacy.**
  - Capital Costs: £20k (or equivalent revenue cost, if leased).
  - Non-Recurrent Revenue Costs: Nil.
  - Incremental Recurrent Revenue Costs (including capital charges): £91k.

1.5.6 In considering these additional investments, it should be noted that the capital costs of the core critical care scheme have now been reduced to under £8m, such that sufficient headroom remains to fund the capital costs of MetaVision (£226k) if the capital budget were set at £8m, and if the Trust Board were minded to adopt this approach. However this still leaves outstanding the issue of the recurrent and non-recurrent revenue costs, and there is as yet no solution for these. The advantage of this approach is that it offers the opportunity for the Trust to equip Neurosciences with a highly desirable MetaVision capability as part of the capital scheme, whilst leaving the revenue funding for further discussion. In other words, having acquired the capability, the Trust would be able to activate it at a later date, ie once the issue of affordability has been satisfactorily resolved.

1.5.7 As regards the need for an improved pharmacy service, it is fully recognised that further work needs to be done to understand the benefits. Therefore this OBC presents what is currently known about the desired improvements, so that the foundation is laid for the future direction of travel. If a better developed case materialises over the coming months, ie one which successfully addresses the revenue costs, it would be open to the Trust to fund the capital costs (£20k) within the contingency allowance of the core critical care scheme.

1.5.8 Because of all the above difficulties, this project is considered to be of medium risk. However the building works should be allowed to proceed at once in order to avoid incurring greater risks at programme level.

## 1.6 Recommendations

1.6.1 Whilst recognising that such expenditure is problematic in the present financial climate, the Trust is asked to:

- Approve this OBC.
- Make a provisional allocation of £7.7m in the Capital Programme across FY 2010/11 and 2011/12 (or £8m if MetaVision is included).
- Note the incremental recurrent revenue costs, which are as yet unfunded.
- Authorise the start of building works as soon as possible.

- Agree that the proposed new unit should open with staffing for only 26 beds, but be equipped for 29 beds which is the maximum number that the physical infrastructure is capable of accommodating.
- Note that the STH Contracting Team has begun negotiating the contractual arrangements for the proposed new unit, but that these negotiations will not be concluded until March 2011 at the earliest.
- Support additional investments for vital service improvements, ie by providing neuro critical care with the MetaVision clinical information system and noting the need for an improved pharmacy service, in the way described in Sections 1.5.6 and 1.5.7 above.

1.6.2 There are a small number of outstanding issues (eg some budgets) which need to be resolved whilst the building works are carried out. Finally, a framework is offered at the end of this OBC as a potentially helpful way of structuring discussion about the way forward.

## **2 INTRODUCTION**

### **2.1 General**

2.1.1 This OBC explains the rationale for investing in a new Critical Care Unit at the Central Campus.

2.1.2 This scheme is an essential component of the Service Reconfiguration Programme. The urgency surrounding the latter means that the building works may need to be fast-tracked, whilst other aspects of the scheme continue to be refined in the months ahead.

### **2.2 Background**

2.2.1 The Trust has approved a Service Reconfiguration Programme which has now been largely completed, ie before winter begins with its customary disruption to services.

2.2.2 The aim of this Programme is to change the configuration of clinical services provided by the Trust such that the efficiency, productivity and quality of the services directly involved improves, that the remaining services suffer no detriment across the whole Trust, and that the size of the Estate delivering these services is reduced.

2.2.3 The programme consists of four workstreams, of which one relates to critical care at the RHH. A key theme of this programme is to reconfigure surgical services and acute medicine. For obvious reasons, it is essential that appropriate critical care facilities are provided in order to support patient care across all hospital sites once this has happened. This means that a re-organisation of critical care at the Central Campus is unavoidable.

2.2.4 A further driver in terms of timescale is the requirement to vacate R Floor at RHH in order to create the Sheffield Clinical Skills Training and Assessment Unit by March 2011 at the latest.

2.2.5 The various factors involved in this situation are explained in more detail next.

## **3 STRATEGIC CASE**

### **3.1 General**

- 3.1.1 The re-organisation of critical care at RHH will be complex, will take many months to achieve, and will require interim arrangements to ensure patient safety.
- 3.1.2 The Case for Change is explained below. It is complicated and involves a number of different drivers.

### **3.2 R Floor, RHH**

- 3.2.1 The process began with the transfer of some acute medicine and cardiology Level 2 and Level 3 activity from RHH to NGH in August 2010. This was followed by the transfer of surgical services Level 2 and Level 3 activity from RHH to NGH during October 2010.
- 3.2.2 The existing facility on R Floor of RHH has now ceased to be viable as a stand-alone critical care unit, because the general Level 3 critical care activity requires (on average) only 2.3 beds, assuming 85% occupancy.

### **3.3 N Floor, RHH**

- 3.3.1 The changes on R Floor will also have significant implications for Neurosciences. Despite having their own dedicated unit on N Floor, Neurosciences Level 3 activity routinely overflows onto R Floor, occupying (on average) just over a third of a Level 3 bed.
- 3.3.2 In anticipation of the closure of R Floor, the Trust's Capital Investment Team (CIT) has already approved a small scheme to create an additional Level 3 bed on N Floor as an interim measure. In order to achieve this, one Level 2 bed has been decommissioned. The corresponding Level 2 activity will be managed as far as possible within the overall bed complement.
- 3.3.3 This is not a sustainable arrangement in the long-term, both from the point of view of the immediate reduction in Level 2 capacity, and because it does not provide the expansion in capacity needed to meet current and predicted workload. To be explicit, this means perpetuating the current situation whereby the Neurosciences Directorate is unable to accept all referrals from surrounding DGHs within the region.

### **3.4 Cardiology, RHH**

- 3.4.1 A further consequence of reconfiguration is the need to ensure continued provision of appropriate facilities for patients requiring Level 2 cardiological support. At the time of writing, the old CCU on B Floor has closed, and cardiology patients are being cared for in SHDU on A Floor.
- 3.4.2 Although this is a safe temporary measure, it is not considered an appropriate environment for cardiology patients, and a more durable long-term solution must be found for them. Although these patients are few in number (ie about 0.5 bed activity post-reconfiguration), it is essential that we do not lose sight of their needs.

### **3.5 Health & Safety**

- 3.5.1 Another driver for change is the present non-compliance with certain regulatory requirements for health & safety. There have been long-standing concerns for many years about the status of R and N Floors in terms of meeting a wide range of regulatory requirements, such as fire prevention & evacuation, infection control, infrastructure to

support appropriate medical gas supplies, etc. Facilities on both floors are not ideal and do not meet HBN requirements, especially in terms of space per bed.

- 3.5.2 Over the years various options have been explored to re-locate the R Floor beds, but no suitable solution has ever been identified. N Floor suffers from similar design constraints, although the situation is worsened by pressures to provide more beds.

### **3.6 European Working Time Directive (EWTG)**

- 3.6.1 Related to this, both general and neuro critical care must comply with the requirements of the European Working Time Directive (EWTG). It will not be possible to achieve compliant rotas with a service fragmented across different floors at RHH, and a new central campus critical care unit will help to address these issues.

#### Current Situation

- 3.6.2 Out of hours medical cover for Critical Care at the central site is currently provided by two sectors of 8 anaesthetic trainees for Neurosciences (on N Floor) and General (on R Floor), supported by separate Consultant (Intensivist) rotas. Level 2 Critical Care patients currently housed on A Floor (SHDU) have medical cover by an F2 doctor, supported by the General Intensivists. This F2, who would not have the competencies to look after a Level 3 patient, is essential to the continuity of care currently in SHDU. Medical cover by anaesthetic staff is also required for Jessop Wing and General Theatres. To enable compliance with EWTG, this is currently covered by one full rota of 8 trainees for Jessop wing, and one half rota for general theatres (hence there are 3.5 sectors of 8 anaesthetic trainees in total at Central Campus). 'Gaps' in the provision of anaesthetic trainees to STH are frequent and have an impact on meeting EWTG. These 'gaps' translate to periods of the General Theatre rota - usually out of hours - being Consultant covered; and where Consultants are required to be in hospital at night, they become unavailable to staff rotas the following day, impacting on elective and emergency workload, and training.

#### Interim Arrangements

- 3.6.3 With the relocation of Level 3 general patients from R to A Floor, a tier of suitably competent trainees will need to be created, with a reduction in total anaesthetic trainees at Central Campus from 3.5 to 3 sectors of 8. This reduction will ensure compliance with EWTG. During the day this area will be staffed by 2 Consultant sessions (am and pm), and an F2 doctor. Out of hours, it is envisaged that the anaesthetic trainee responsible for A Floor will also provide cover for the General Theatres. This will likely necessitate increased input from Consultants covering both General and Intensive Care rotas.

#### Proposed New Unit

- 3.6.4 The co-location of general critical care with neuro critical care will allow a case mix and volume of patients which meets training requirements for Intensive Care, as well as being crucial to the recognition of the training programme for advanced training in Intensive Care medicine. Critical Care outreach and referrals during the day will be enabled as the General Intensivist will have the support of the Neuro Intensivist. It has been agreed that a dedicated K Floor anaesthetic trainee with support of a second anaesthetic trainee on A Floor can safely staff K Floor out of hours, with separate rotas for Consultant (Neuro and General Intensivist) supervision, and therefore the current F2 tier at RHH is no longer required on the Central Campus out of hours.
- 3.6.5 Compliance with EWTG will be assured, and the A Floor sector anaesthetic trainee will be able to respond more flexibly to the workload needs within the hospital as (s)he would no longer be tied to high level dependency patients on A Floor.

3.6.6 There are no additional revenue costs for medical staff. In fact, at the point when K Floor opens, there will be cost savings from the out of hours component of 5 x F2 doctors at RHH.

### **3.7 Sheffield Clinical Skills Unit, RHH**

3.7.1 There is a further driver to vacate R Floor in order to create the planned Sheffield Clinical Skills Unit by March 2011 at the latest. The SHA has allocated funds for this scheme which will be lost if implementation is not achieved on schedule.

3.7.2 It should be noted that this funding has already been carried over from FY 2009/10 to FY 2010/11, and there is now significant pressure to complete within the current financial year.

### **3.8 Activity Analysis**

3.8.1 For all these reasons, it is no longer tenable to maintain the present configuration of critical care facilities at RHH, and there is a compelling case for the creation of a new facility. It is now necessary to consider how large the new facility should be, and a thorough activity analysis has been conducted to determine this. It was carried out in 3 stages.

3.8.2 In the first stage, spreadsheets were compiled for FY 2008/09 and part-year FY 2009/10 showing all critical care activity by specialty (split between ITU and HDU). With the help of surgical services and acute medicine, this activity was then adjusted to take account of reconfiguration, ie by deducting all the critical care activity by named consultant which was due to transfer to NGH. After considering growth projections for all the specialties due to remain at RHH, it was concluded that - in general - growth was static, the main exception being Neurosciences. Taking account of this, 33 beds were required, based on a midnight count at 85% occupancy. However this figure was derived from a bottom-up approach which took each type of critical care bed in isolation, rounding up where part numbers were involved, and then adding the total together. Although this seemed a reasonable starting point, it was considered prudent to delve further and examine the variations in bed occupancy which are known to occur in practice.

3.8.3 In the second stage, a series of graphs was developed showing actual bed occupancy on a night-by-night basis (using FY 2009/10 activity adjusted for the post-reconfiguration situation). The main conclusion was that by continuing to look at each bed type in isolation, there was a risk that significant variations in bed occupancy would mislead the Trust into resourcing the upper limit, thus creating over-capacity. The only way to overcome this was to analyse the activity as a whole, with the beds being used flexibly, as done next.

3.8.4 In the third stage, the series of graphs was consolidated into a single graph combining all post-reconfiguration critical care activity. This smoothed out the variations and demonstrated that the maximum bed requirement – based on FY 2009/10 activity - would be 27 beds on a bed nights basis. This would represent 78% occupancy. The outcome is that it provides sufficient flexibility to cope with the peaks but does not take into account the current level of refusals or any growth. At 27 beds, the only margin to cope with these demands is the difference between 78% and 85% occupancy. The requirement would rise by a further four beds if day occupancy at 85% is taken into account. These four beds represent the daytime variation generated by short stay surgical patients currently cared for on SHDU, as explained in Section 3.9 below. Appendices A and B explain these findings in more detail. Although the overall number of beds required is smaller in this scenario (ie than the 33 beds originally identified in Section 3.8.2 above), this approach can be made to work if the beds are regarded as a flexible resource to be shared without ring-fencing by any single directorate.

### **3.9 POSU (now SHDU), A Floor, RHH**

3.9.1 This Section aims to explain the role of POSU and examines the extent to which its use is suitable for critical care patients. The High Dependency Unit currently situated on A Floor was first opened on 9 January 2007 as a Post-Operative Surgical Unit (POSU).

#### Current Situation

3.9.2 The concept of POSU was originally seen in the context of needing to expand critical care. The North Trent Critical Care Network (NTCCN) was aware of the increasing demand for facilities across the region. After the winter of FY 2004/05, it concluded that there would be high emergency demand in future, and POSU emerged as a solution.

3.9.3 This development was in line with the report 'Modernising Care for Patients Undergoing Major Surgery' which supported - in general terms - the notion that surgical patients prioritised poorly against other admissions to critical care (as was the experience across the region), and that a simple set of measures could reduce a number of complications following surgery.

3.9.4 It was also recognised that hospitals across the country were admitting these patients into theatre recovery areas in order to provide post operative ventilation. However, it was also recognised nationally that this practice was not properly developed, staffed or supported to allow safe conduct of post operative or general critical care.

3.9.5 The POSU development at RHH mirrored the units at St Thomas & Guy's London, Royal Liverpool University Hospitals, Leicester Royal Infirmary, and NGH. The units in STH were seen as an enabler to continue to support the Trust's elective and emergency activity.

3.9.6 In FY 2005/06 the NTCCN predicted a rise in the Level 3 (ITU) growth for RHH, thus displacing Level 2 (HDU) capacity, which would further exacerbate the problem. In the Case of Need, PAS data predicted historical surgical growth. Unmet need was recognised, gynaecology and IOG requirements were underway. Upper GI growth was emerging, increases in Bariatric and Hepato-biliary surgery in particular.

3.9.7 STH continued to experience rising weekly cancellations due to lack of critical care beds. The decision not to support Doncaster's business case for expansion led to the need to look at providing surgical patients with an appropriate environment for immediate post operative care at a higher level which would not be compromised by the emergency demands on critical care.

3.9.8 However, since POSU opened nurse staffing issues developed and continued to be problematic. The ability to cover every shift with a senior critical care nurse proved difficult as recruitment across the region suffered a shortage. Ability and confidence to admit as a result became an issue. After 5 months HDU on R floor relocated to A Floor for renovation works.

3.9.9 In December 2007 ICU and HDU relocated to A Floor due to infection. In February 2008 Neurosurgery again relocated due to infection. In August 2008 HDU on R Floor closed and moved to A Floor.

3.9.10 At that point POSU became the Surgical High Dependency Unit (SHDU), incorporating mainly surgical HDU and POSU patients in order to accommodate the clinical skills department relocation due to the Theatre Admission Unit development. Since that date SHDU also accepts medical HDU patients, and more recently Cardiology patients.

#### Interim Arrangements

3.9.11 POSU has capacity and services to support 10 x Level 2 patients. Alternative

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configurations could be 7 x Level 2 and one x Level 3, or 6 x Level 2 and 2 x Level 3 (short term and specific) patients.

- 3.9.12 After reconfiguration, it will provide critical care for both Level 2 and 3 patients as per the interim plan until the proposed new critical care unit is available.
- 3.9.13 The unit on A Floor was originally designed as a POSU, but the clinical environment and services have been modified where possible over the period of change. All bed areas can now deliver O<sub>2</sub> at a higher flow (1300 litres/minute across the unit). Extraction is a problem in the isolation room. As these modifications have been implemented, the number of bed bays has progressively reduced from the original 14 to 12 to 10. The isolation cubicles have reduced from 2 to one, due to space and the oxygen extraction issues. The recommendation by infection control for this type of unit is 2 cubicles. The pharmacy bay has needed to increase in area in order to accommodate drug preparation for higher Level 2 and 3 patient requirements.
- 3.9.14 The recommendations for patients to be nursed in an area where natural light is accessible cannot be achieved on A Floor. Therefore in the long term the unit is not acceptable to clinical staff.
- 3.9.15 The interim arrangements require further storage and relatives' accommodation to be found and clinical protocols for admission, discharge and transfers to NGH to be in place.
- 3.9.16 This interim provision at RHH on A Floor will be a refinement of the present capability. Instead of having 8 beds open for 7 nights as currently, there will be 6 beds (2 x Level 3 and 4 x Level 2) for 7 days a week. This plan will be reviewed in the weeks and months immediately after reconfiguration in line with a similar review of NGH activity.
- 3.9.17 It should be noted that if SHDU did not already exist, additional cost would have been incurred in order to finance an enabling scheme to accommodate critical care on a temporary basis.

#### Proposed New Unit

- 3.9.18 Assuming that this business case is approved, SHDU on A Floor will close completely as full provision will be in the proposed new critical care unit.
- 3.9.19 At this point the daytime variation at RHH will be managed by patients being cared for in extended recovery until a bed is available on either K Floor or their designated ward.
- 3.9.20 It is essential that all patients requiring general Level 2 and Level 3 are managed by Consultant Intensivist staff and associated junior medical teams. To ensure continued compliance of EWTD and adequate out of hours cover, the proposed new unit will allow both neuro and general junior teams to provide safe and quality service cover. Having split locations i.e. A, R and N floor with adequate cover is not sustainable in the long term, due to MMC allocations and EWTD compliance.

#### Potential for Future

- 3.9.21 The space currently occupied by SHDU will be vacated.
- 3.9.22 It is envisaged that SHDU could then be established as a care unit for the enhanced recovery programme and/or the hospital at night project in the future. It could also provide for a graduated care pathway and extended recovery. A separate business case will need to be developed for whichever course is adopted.



- 3.9.23 Importantly, any such business case will need to take into account the need for A Floor to remain a recognised decant facility for critical care in the event of an incident and/or maintenance.
- 3.9.24 Lastly, that business case will also need to reflect the need for A Floor to become the hospital's Level 2 expansion for the future.

### **3.10 Potential Size of the Proposed New Unit**

- 3.10.1 For all the above reasons, a new facility is needed on the Central Campus with about 27 beds (exact number to be confirmed later in this OBC) in order to provide sufficient capacity for current activity levels, along with a small amount of growth.

#### Terminology

- 3.10.2 In this Business Case, a distinction is made between the following terms:
- “Beds” means the number of beds which are provided and resourced but not necessarily taken into use, because of the need to maintain a small proportion to meet variation in demand, eg for emergencies.
  - “Bed nights” or “nights” means the number of beds which are actually used, ie occupancy.
  - “Bed days” means the number of beds which are occupied (or likely to be) for tariff purposes.

#### Overall Number of Beds

- 3.10.3 In total, there used to be a total of 33 critical care beds available at RHH. Interim arrangements now exist for the 25 beds which remain. The latter reflects only 2 x Level 3 and 4 x Level 2 beds remaining on A Floor and recognises that for the interim period neuro have ‘lost’ one x Level 2 (NH DU) bed as a consequence of creating a 7<sup>th</sup> Level 3 bed on N1, as shown in Figure 1 below.
- 3.10.4 However, when the proposed new unit is operational, it will have enough physical floor space to accommodate 29 beds. Hence there is an argument in favour of building a 29-bed unit in order to achieve a more comfortable level of future-proofing.
- 3.10.5 That said, the activity analysis suggests that not all these beds might be filled at the outset, and therefore it becomes appropriate to identify the most sensible number of beds to open the unit with in the first instance. Taking the most cautious view, this figure might be 26 beds, which is slightly less than the activity analysis suggests.
- 3.10.6 From the above analysis, there would appear to be 3 options. These are as follows: 26 beds (ie the more cautious figure to open the unit with), 27 beds (the maximum figure supported by the activity analysis), and 29 beds (the maximum physical capacity of the proposed new unit). In due course, Section 5 (Financial Case) will examine the costs and benefits of each.
- 3.10.7 In summary, the issues involved are perhaps made clearer by reference to the Table shown overleaf:

**Figure 1 – Central Campus Critical Care Bed Summary**

Beds	Previous Situation on N Floor (Neuro) and R Floor (OSCCA)	Interim Situation on N Floor (Neuro) and A Floor (OSCCA)	Post-Reconfiguration		
			Costed Option 1 (26 beds) 1 extra NITU	Costed Option 2 (27 beds) 1 extra NITU 1 extra NHDU	Costed Option 3 (29 beds) 1 extra NITU 3 extra NHDU
<b>Neurosciences Directorate</b>					
NITU	6 beds	7 beds	8 beds	8 beds	8 beds
NHDU	13 beds	12 beds	12 beds	13 beds	15 beds
<i>Sub-Total</i>	<i>19 beds</i>	<i>19 beds</i>	<i>20 beds</i>	<i>21 beds</i>	<i>23 beds</i>
<b>OSCCA Directorate</b>					
ITU	5 beds + 1 bed used by Neuro patients	2 beds	2 beds	2 beds	2 beds
HDU	8 beds	4 beds	4 beds	4 beds	4 beds
<i>Sub-Total</i>	<i>14 beds</i>	<i>6 beds</i>	<i>6 beds</i>	<i>6 beds</i>	<i>6 beds</i>
<b>TOTAL</b>	<b>33 beds</b>	<b>25 beds</b>	<b>26 beds</b>	<b>27 beds</b>	<b>29 beds</b>

3.10.8 From this, it can be seen that – after reconfiguration - Neurosciences will be **increasing** its beds at RHH, whilst general critical care at RHH will be **reducing** from a total of 14 beds (previous situation) to 6 beds (post-reconfiguration).

#### General Critical Care Beds

3.10.9 The situation concerning the OSCCA beds is somewhat complex and merits more detailed explanation, beginning with HDU and then covering ITU.

3.10.10 As regards its Level 2 (HDU) capability, General Critical Care used to have a total of 8 x Level 2 beds on A Floor. Four of these beds have now moved to NGH D and E Floors. The remaining four beds have stayed on A Floor at RHH. At the same time 2 x Level 3 (ITU) beds have moved down from R Floor to join A Floor. These 6 beds will provide the interim critical care capacity at RHH. It is accepted that during this period there will be occasions when patients will need to be transferred to the NGH unit, due to either the complexity of their clinical condition or capacity pressures.

3.10.11 As regards its Level 3 (ITU) capability, General Critical Care used to have a total of 6 beds on R Floor. Of these, one has been routinely used by Neuro for its overspill activity for several years. In recent years up to and including FY 2008/09, activity levels were around 270 bed nights per annum, giving an occupancy rate of about 74%. However in

FY 2009/10 and FY 2010/11 to date, the overflow activity appears to have reduced (but for no obvious reason) to around 130 bed nights and an occupancy rate of about 36%. As part of reconfiguration, the bed in question has now been 'repatriated' to Neuro. This came about because the Trust recently sponsored an £80k enabling scheme for the creation of a temporary Level 3 (ITU) neuro bed on N Floor in order to manage this workload when R Floor closes. The scheme entailed Neuro giving up one Level 2 (NHDU) bed for this purpose. The extra Level 3 activity suggests a requirement of around a third of a bed, which therefore offers some limited flexibility in managing the displaced Level 2 work. Of the five remaining ITU beds on R Floor, two have moved to A Floor, as described above. Three have moved to NGH D Floor (together with the resources associated with a fourth bed, the circumstances of which are described in more detail at Footnote 1 in Section 5).

- 3.10.12 Once the K Floor scheme is completed, the 2 x Level 3 beds and 4 x Level 2 beds on A Floor will transfer to K Floor. At this point a complexity arises. Strictly speaking, the Level 3 capacity required amounts to 2.31 beds (based on night count) or 2.74 beds (based on day count). However, for obvious reasons, OSCCA cannot open a partial bed. Therefore OSCCA's intention is to seek designation for 2 x Level 3 beds but secure commissioner support for a flexible designation within the remaining beds to allow additional Level 3 patients to be cared for, when clinically appropriate, with income guaranteed to follow. On those occasions when additional Level 3 beds are required, the associated nursing staff will be resourced from within OSCCA's overall complement across both sites.
- 3.10.13 There will need to be a discussion with commissioners about bed designation and flexibility, how this links to targets for both neuro and general critical care, and the fact that one bed has now been 'repatriated' from general critical care to neuro.
- 3.10.14 In conclusion, the process of transitioning the OSCCA beds at RHH to support reconfiguration is shown below:

**Figure 2 – Central Campus General Critical Care Beds**

RHH	Pre-Reconfiguration	Interim Period	Post-Reconfiguration
R Floor Level 3 (ITU)	6 beds	Nil	Nil
A Floor Level 2 (SHDU)	8 beds	2 x Level 3 (ITU) beds 4 x Level 2 (HDU) beds	Nil
K Floor (ITU and HDU)	Nil	Nil	2 x Level 3 (ITU) beds 4 x Level 2 (HDU) beds
<b>Total</b>	<b>14 beds</b>	<b>6 beds</b>	<b>6 beds</b>

#### Conclusion

- 3.10.15 Many readers will probably feel unable to assess this situation unless also given some understanding of the wider context of bed numbers at the NGH Critical Care Unit. Briefly, of the original 14 beds at RHH, 6 remain on K Floor, one has been 'repatriated' to neuro, and 7 have transferred to NGH. However, the situation at NGH is equally complex and would interrupt the flow of this narrative if inserted here. Instead, the key points are summarised in Section 5 (Financial Case) below.
- 3.10.16 In summary, this OBC is predicated on a total of 6 ITU and HDU beds being needed by General Critical Care at the Central Campus under most post-reconfiguration scenarios. Whilst there are cogent reasons for this figure, it does give rise to some issues which may need to be resolved. Meanwhile, the potential size of the proposed new critical care unit depends on one key variant, which is how large the increase in Neurosciences beds should be, and this will also be covered in Section 5 (Financial Case) below.

### **3.11 Key Investment Objectives**

3.11.1 The objectives of the proposed new unit are:

- To meet the anticipated future critical care facilities required at RHH post-reconfiguration until 2020.
- To rationalise critical care facilities on the RHH site and enable the amalgamation of Neurosciences Critical Care with the residual general Level 3 beds into a single unit which meets all regulatory requirements, eg physical layout, fire regulations, infection control, EWTD, etc.
- To ensure continued provision of appropriate facilities for patients requiring Level 2 cardiological support.
- To clarify the clinical protocols and arrangements to ensure the appropriate transfer of patients requiring complex Level 3 care to NGH.
- To create expansion space to accommodate further growth in demand on the central campus which is likely to result in a need for increased critical care facilities eg complex head and neck, haematology, head injuries, and cancer IOGs (other than GI).

### **3.12 Expected Benefits**

3.12.1 This scheme is about re-providing an existing service in a way which achieves improved quality of service for patients.

3.12.2 Expected benefits are:

- Achieving a major milestone in support of the service reconfiguration programme.
- Providing adequate capacity and appropriate critical care facilities for the Central Campus.
- Vacating R Floor, thus facilitating the Clinical Skills Project.
- Achieving much closer compliance with Health Building Note (HBN) 57, for example, regarding medical gas pipeline systems, infection control, estates fire code, etc.
- Allowing essential expansion of Neurosciences.
- Ensuring an acceptable level of compliance with health & safety regulations.
- Enabling progress towards compliance with EWTD.
- Enabling the Trust to maintain recognised critical care training for both basic and advanced trainees.
- Freeing up space on A Floor for future developments.

### **3.13 Fit with Trust Objectives**

3.13.1 Subject to affordability, the fit is very good. This investment will promote the Trust's strategic objectives of achieving clinical excellence, being patient-centred, and engaging staff to transform ways of working. Above all, it will enable service reconfiguration to be completed, and the Sheffield Clinical Skills Unit to open on schedule.

### **3.14 Summary**

- 3.14.1 At present there is a user expectation that the proposed new unit will be provided by 12 December 2011. In the meantime, there is an acceptance that interim arrangements for critical care will be necessary at RHH until then.
- 3.14.2 Weighing the balance of risk, the proposed interim arrangements are recognised as being far from ideal but are acceptable, provided that the new scheme is delivered on time. However, if there is any perception that the scheme may not progress as planned, it would be extremely difficult to maintain the support and commitment of key users on the Central Campus, thus prejudicing the success of service reconfiguration.
- 3.14.3 It is now necessary to consider where the proposed new unit should be located.

## **4 ECONOMIC CASE**

### **4.1 General**

4.1.1 An Option Appraisal has been carried out of potential options for siting the proposed new unit. Realistically, there are six possible options, of which the first is the baseline position against which to assess the other five. The summary below reflects the implications of each option.

### **4.2 Option 1 – Continue with Current Approach**

It is unacceptable to do nothing because this would have numerous damaging consequences for the Trust. It would prevent completion of service reconfiguration. There would be continued non-compliance with a wide range of regulatory requirements, including EWTD. There would be no capacity for expansion. The interim critical care arrangements would become permanent and therefore completely unacceptable to all users.

### **4.3 Option 2 – Use B Floor Podium West**

It is assumed that a minimum of approximately 2,000m<sup>2</sup> would have to be made available in order to create a unit of the appropriate size. This option would entail the redevelopment of the old CCU, EAU and the Minor Injuries Unit, together with partial remodelling of the Rheumatology X Ray Department. This option is disadvantaged by the lack of natural daylight. Potential issues to consider are:

- Remote from main Neurosciences Inpatient accommodation.
- Positions of structural columns and service risers likely to inhibit the layout of the unit.
- Problems with lift access to theatres and having to transport critically ill patients across the main concourse of the hospital.
- Whilst theoretically it is possible to free up the site area, it is by no means straight forward and would undoubtedly have enabling works costs associated with it.
- Difficult to relocate displaced departments.
- Represents the optimum solution as far as Firecode compliance is concerned.
- This is the only option that would allow direct ambulance access to the unit.
- Site has good construction access.
- Occupies space on ground floor that could be used for ambulatory patients.

### **4.4 Option 3 – Use Wards M1 & M2**

M floor is a mixture of neurosciences outpatients (M1) and medical inpatients (M2). Issues to consider are:

- M2 ward was recently refurbished at a capital cost of £2.2m. This investment would effectively be written off.
- Since the option appraisal was carried out, M2 has been confirmed for use as a respiratory ward.
- Neurosciences OPD would have to be relocated. This would have significant benefit to these patients, providing a suitable alternative location can be found.
- The only area within RHH able to accommodate neuro OPD would be B Floor, thereby requiring enabling schemes to the areas occupied by the old CCU and EAU.
- There is ad hoc office accommodation at the rear of M1 which would also need re-providing.
- Capital cost of this option is likely to be relatively expensive.

#### 4.5 Option 4 – Use Wards Q1, Q2, Q3 & Q4

Q Floor has been selected as it is one of the few floors with no University occupancy or specialist accommodation/equipment that would be difficult and expensive to relocate. Potential issues to consider are:

- Would require all the medical beds across the floor to be relocated to other parts of the hospital
- Would require Stroke Service to be relocated
- The use of this space would restrict other options the Trust may have post clinical reconfiguration.
- Fire officer may have issues/concerns with keeping critically ill patients on Q floor.
- Increased floor area would allow full compliance with HBN 57 and would give scope for expansion of the unit if required.
- Construction access is difficult.
- Site has good access to plant space on R Floor.

#### 4.6 Option 5 – Use Wards N1 & N2

This option would expand the existing NITU across both wards at this level with construction carried out on a phased basis. Potential issues to consider are:

- Site has optimum links to Neurosciences Inpatient accommodation (assuming current N2 can be relocated in close proximity – see bullet points below).
- There is some STH accommodation within the tower section of the building that could be redeveloped for this unit.
- N2 would need decanting to another ward to allow two-phased scheme. Future potential to move back to M1 if neuro OPD is relocated.
- Managing/maintaining the current level of activity through the phasing of the project (ie multi-location working, with N Floor capacity down to 14 beds for a period of time, which would represent an unacceptable loss of 5 beds).
- The potential to re-provide lost neuro beds is limited at a time when the interim solution for R Floor and cardiology level 2 is also required.
- This option would only require one additional ward of new space.
- Significant disruption and noise during scheme.
- Potential Infection control concerns.

#### 4.7 Option 6 – Use Wards K1 & K2

K Floor has now been freed up as a result of clinical reconfiguration, and the general surgery work previously carried out in this accommodation has transferred to NGH. Potential issues to consider are:

- Contractor would have access to all the accommodation in one phase which would significantly reduce the construction period.
- Site has good access to plant space on J Floor.
- K Floor wards are the next set of wards scheduled for refurbishment on the ward refurbishment programme, therefore there is potential to realise either a net saving or, alternatively, bring forward other RHH wards in the refurbishment programme.
- No need to decant any existing wards.
- There is a three floor gap between neuro critical care and neuro inpatients, but potential to swap wards within neurosciences and move N2 to L Floor.
- The University currently occupies certain areas of K Floor.
- Capital cost likely to be relatively lower.
- N1 becomes free for re-use/expansion.
- Design work indicates that there is space to accommodate a maximum of 29 beds.

## 4.8 Evaluation Criteria

4.8.1 Key stakeholders in the SR service have evaluated these options against the following benefit criteria:

**Figure 3 – Benefit Criteria**

Benefit Criteria	Supporting Definition
Quality of Care, Clinical Risk, and Accreditation	Meeting established clinical standards; timeliness of intervention; establishing correct diagnosis and treatment plans; providing services based on the needs of patients; promoting good practice and multi-disciplinary working; providing appropriate facilities for the needs of specific specialties; enabling good infection control practice; facilitating clinical networks; meeting statutory requirements; minimising risk to patients and staff; meeting requirements for junior doctor training and EWTD; enabling individual specialties to meet specific accreditation standards.
Physical Environment	Providing an environment which is conducive to the well being of patients and their relatives; compliance with building notes; providing adequate security for patients, staff and equipment, meeting standards for privacy and dignity; access for patients, relatives, staff, and ambulances.
Clinical and Functional Relationships	Proximity to services with critical or frequent links, eg theatres, neuro in patient accommodation; relationships with other critical care facilities.
Deliverability	Ability of the scheme to meet essential requirements; number of consequential or enabling schemes adding to complexity and cost; noise and physical disruption; potential for delays and unforeseen circumstances; ability to deliver the scheme within the required timescale.
Responsiveness to Change	Ability to respond effectively to peaks and troughs in demand across different specialties; flexibility to meet potential growth in demand; ability to work flexibly with other facilities.
Staffing	Assisting in the recruitment and retention of staff; improving the working environment; efficient use of staff time; maintaining and developing a flexible workforce.

4.8.2 A weighting exercise has been carried out as recommended in the Capital Investment Manual, and the results are as follows:



**Figure 4 – Weighting of Benefit Criteria**

Benefit Criteria	Weighting (Wt)
Quality of Care, Clinical Risk, and Accreditation	20
Physical Environment	18
Clinical and Functional Relationships	15
Deliverability	20
Responsiveness to Change	15
Staffing	12
<b>Total</b>	<b>100</b>

4.8.3 The key stakeholders discussed and agreed a score for each of the six options on the basis of 0 (very poor) to 5 (excellent), which was then multiplied by the weighting in order to arrive at a weighted score. The results of this scoring exercise are shown below:

**Figure 5 – Scoring of Options**

	Option 1 Do Nothing	Option 2 B Floor	Option 3 M Floor	Option 4 Q Floor	Option 5 N Floor	Option 6 K Floor
Benefit Criteria	Sc x wt = total	Sc x wt = total	Sc x wt = total	Sc x wt = total	Sc x wt = total	Sc x wt = total
Quality of Care, Clinical Risk, & Accreditation	1 x 20 = 20	3 x 20 = 60	4 x 20 = 80	4 x 20 = 80	4 x 20 = 80	4 x 20 = 80
Physical Environment	1 x 18 = 18	2 x 18 = 36	4 x 18 = 72	4 x 18 = 90	4 x 18 = 72	4 x 18 = 72
Clinical and Functional Relationships	1 x 15 = 15	1 x 15 = 15	4 x 15 = 60	2 x 15 = 30	4 x 15 = 60	4 x 15 = 60
Deliverability	5 x 20 = 100	1 x 20 = 20	1 x 20 = 20	1 x 20 = 20	1 x 20 = 20	4 x 20 = 80
Responsiveness to Change	1 x 15 = 15	3 x 15 = 45	3 x 15 = 45	5 x 15 = 75	4 x 15 = 60	3 x 15 = 45
Staffing	1 x 12 = 12	2 x 12 = 24	4 x 12 = 48	3 x 12 = 36	4 x 12 = 48	4 x 12 = 48
<b>Benefit Points</b>	<b>180</b>	<b>200</b>	<b>325</b>	<b>331</b>	<b>340</b>	<b>385</b>
<b>Ranking</b>	<b>6<sup>th</sup></b>	<b>5<sup>th</sup></b>	<b>4<sup>th</sup></b>	<b>3<sup>rd</sup></b>	<b>2<sup>nd</sup></b>	<b>1<sup>st</sup></b>

## 4.9 Preferred Solution

- 4.9.1 As expected, K Floor emerged as the preferred solution because it offers the major advantage of not requiring any enabling schemes and allows the building contractors unlimited access to the whole site once the surgical wards have transferred to the NGH. There are no outstanding infection control issues, as the Trust's Director of Infection Prevention and Control has been consulted throughout.
- 4.9.2 The option which was ranked second (ie N Floor) would require N2 to be relocated and have to be completed in two parts, resulting in lost capacity for neuro critical care and raising infection control issues for the period of the scheme.

## 4.10 Benefit Points

- 4.10.1 There is now a need to take the benefit points awarded to the Preferred Solution and conduct a second scoring exercise in order to assess each of the 3 costed options on the basis of the benefits resulting from their implementation on K Floor.
- 4.10.2 After being consolidated, the results of these 2 exercises are shown below:

**Figure 6 – Benefit Points**

Benefit Points Awarded by Project Team (Total out of 100)		Rationale for Benefits Points Awarded By Project Team	Points Carried Forward from Figure 5 above	Total Benefit Points	Ranking
<b>Costed Option 1 on K Floor (26 beds)</b>	65 points	Is cautious option. Goal would be to open the unit with fewer beds than the activity forecast justifies, and see how it goes. Scores well because present climate of STH opinion is risk averse.	Add 385 points already awarded for using K Floor.	<b>450 points</b>	<b>2nd</b>
<b>Costed Option 2 on K Floor (27 beds)</b>	80 points	Is clinically preferable option, as it will meet the Trust's activity needs at most times.	Add 385 points already awarded for using K Floor.	<b>465 points</b>	<b>1st</b>
<b>Costed Option 3 on K Floor (29 beds)</b>	50 points	Is maximum number of beds that K Floor can accommodate. Is probably the best course in the long run, but the running costs may make it too risky to open the unit with 29 beds, at least until we see how the activity builds.	Add 385 points already awarded for using K Floor.	<b>435 points</b>	<b>3rd</b>

- 4.10.3 Although Costed Option 2 on K Floor (27 beds) is ranked first, no attempt is made to offer a recommendation just yet. Given that affordability is likely to be crucial, it seems prudent to wait and see how the financials work out in Section 5.

#### 4.11 Timetable

- 4.11.1 The Estates Directorate (Stuart Hindmarch) has confirmed that if K Floor is approved as the location for the proposed new unit, the timetable for the building works would be as follows:

**Figure 7 – Timetable for Preferred Solution**

#	Event	Date
1	Negotiations opened for commissioner support.	Mid November 2010
2	This OBC is submitted to TEG for approval.	24 November 2010
3	Trust issues invitation to tender (ITT) for the building works.	3 December 2010
4	This OBC is submitted to Trust Board for approval.	15 December 2010
5	Tenders are received.	14 January 2011
6	Building works commence on K Floor (32 week contract).	21 February 2011
7	Building works are completed on K Floor.	11 November 2011
8	Commissioning of proposed new unit begins (4 weeks).	14 November 2011
9	Proposed new unit is operational.	12 December 2011

#### 4.12 Summary

- 4.12.1 It is recommended that the proposed new unit should be located on K Floor at RHH.
- 4.12.2 The Estates Directorate already has well advanced design plans for this scenario.
- 4.12.3 There is an issue about how many beds the unit should open with, but this is best decided in the next Section (Financial Case) as affordability will be a key factor.

## **5 FINANCIAL CASE**

### **5.1 General**

5.1.1 This Section presents the estimated capital and revenue costs of implementing the proposed new unit on K Floor.

### **5.2 Asset Life**

5.2.1 The Trust Finance Directorate has confirmed that the asset life for the Build Works will be 33 years, and that the asset life for the equipment will be 10 years.

### **5.3 Outline Plan**

5.3.1 An outline implementation plan is at Appendix C. From this, it is concluded that the new unit could be operational from 12 December 2011 onwards.

### **5.4 Key Principles**

5.4.1 Some key principles have been established about how the proposed new unit will function. These have a direct bearing on the financials and therefore are made explicit next. It is assumed that:

- Given the Trust's existing directorate structure, both components of the proposed new unit (ie those belonging to OSCCA and Neurosciences respectively) will be financially and managerially separate. However, support costs will be shared.
- Consultant staffing will remain unchanged.
- Junior medical staff will be provided on a sector basis.
- Nursing staff will remain accountable to their present management structures. The general critical care nursing staff will share a joint rota with their colleagues at NGH. The neuro critical care staff will have a separate rota. However, co-operation between directorates will ensure best practice for all patients and maximise the efficient use of available beds at times of operational pressure.
- Nurse staffing levels across both general and neuro critical care will be as per the Trust Acuity and Dependency tool, ie 6.51 nurses per Level 3 bed and 3.5 nurses per Level 2 bed. The overall level and number of beds will be flexed to meet demand and will require the continued flexible working across the Neurosurgery nursing workforce (K Floor and N Floor). Similarly, there will be a need for operational flexible working between neuro and general critical care (K Floor) and across the city (RHH and NGH general critical care).
- The current basis of income for both general and neuro critical care is local tariff. These local tariff unit costs are based upon Reference Costs in earlier years. Thus it can be assumed that from an SLR perspective both the general and neuro critical care Service Lines are broadly balanced with no recurrent deficit or surplus. Any non-recurrent deficit or surplus would solely be due to the timing issue of the Reference Costs referring to an earlier time period.
- Finally, by the time that the proposed new unit opens, the tariff will be charged on the basis of the patient's condition, ie the numbers of organs being supported. The charge to commissioners will be at local price based on the directorate which is providing the care.

## 5.5 Key Operational Differences

5.5.1 However, there are some key differences in the operational practices of the two components. These are as follows:

- **MetaVision.** The general critical care service throughout the Trust is fully equipped with the MetaVision clinical information system for data collection and patient care, whereas this system is not currently used by the Neurosciences Directorate. Appendix D suggests how commonality of standards could be achieved.
- **Pharmacy.** The general critical care service throughout the Trust is increasingly moving towards meeting national standards for pharmacy support, whereas neuro critical care still falls far short of this. Appendix E suggests how commonality of standards could be achieved.

## 5.6 Capital Costs

5.6.1 At OBC Stage, the STH Estates Directorate has estimated the capital costs to be as shown below.

5.6.2 Please note that only one set of figures is available, which is for the maximum physical capacity of 29 beds. Ideally, it would also have been preferable to see capital costings for 26 and 27 beds respectively, but this was not practicable in the time available. However it does introduce a distortion when trying to assess the entire financial picture in a fair and balanced way.

**Figure 8 - Capital Costs For K Floor Scheme (29 beds)**

	Item	Cost (incl.VAT)	Comments
<b>Works Cost</b>			
	Building Works	£1,314,000	
	Engineering Works	£2,715,262	
	Enabling Works: Univ Accommodation	£300,000	See Note 1
	Enabling Works: Plant Replacement	£528,000	
	Offices not provided on K Floor	£36,000	See Note 2
	<b>Sub-Total</b>	<b>£4,893,262</b>	
<b>External Fees</b>			
	Clerk of Works – Building	£6,000	
	Architect (AF) @ 3.6%	£129,877	
	Structural Engineer	£2,500	
	Quantity Surveyor	£30,000	
	Project Manager	£0	
	Planning Supervisor	£3,000	
	Safety Co-ordinator	£0	
	Asbestos Surveys	£5,000	
	Clerk of Works – Site Engineer	£20,000	
	Legionella Consultant	£2,000	
	Energy Consultant	£3,000	
	M&E Consultant	£85,000	
<b>Internal Fees</b>			
	Estates Capital Team	£80,000	
	<b>Sub-Total</b>	<b>£366,377</b>	

	Item	Cost (incl.VAT)	Comments
<b>Equipment</b>			
	Medical Equipment	TBC	
	Hotel Services Equipment	TBC	
	Vehicles	TBC	
	Furniture and Furnishings	TBC	
	Telephone Installation	TBC	
	IT Equipment	TBC	
	Disposal of Equipment	TBC	
	<b>Sub-Total</b>	<b>£1,800,000</b>	See Note 3
<b>Non Works Costs</b>			
<b>(External)</b>	Building Regulations	£12,000	
	Commissioning (ie removals/porterage/storage)	£25,000	
	Planning Permission	£0	
	Asbestos Removal	£30,000	
	Disposal & Site Clearance	£5,000	
	Approval & Digitising of Drawings	£1,000	
	Specialist Commissioning (eg med gas AP)	£5,000	
<b>Non Works Costs</b>	IT Services & Set Up	£20,000	
<b>(Internal)</b>	Telephone Services & Set Up	£5,000	
	Domestic/Cleaning Costs (including infection control of dust)	£10,000	
	Pharmacy (Med Gases SQP)	£2,000	
	Bio Medical Engineering	£2,000	
	Portering	£0	
	Supplies	£10,000	
	<b>Sub-Total</b>	<b>£127,000</b>	
<b>Contingency</b>	Planning contingency @ 10.22%	£500,000	
	<b>Total Project Cost</b>	<b>£7,686,639</b>	
<b>Other Costs</b>	Business Case Costs	£30,000	See Note 4
	<b>GRAND TOTAL</b>	<b>£7,716,639</b>	

**Notes:**

1. Is estimated cost of the enabling scheme to replace the floorspace on K Floor given up by the University of Sheffield. Scale of this scheme now reduced. Exact location yet to be decided.
2. Is estimated cost of generating the outstanding balance of accommodation requested by critical care. Exact location yet to be decided.
3. Covers Group 2 and Group 3 equipment. Full list is held by Paul Radford in Supplies. Is mainly furniture but also includes 29 GE monitors, 28 pendants, 23 PCs, 17 Lantronics boxes, 12 PACS monitors, telecomms equipment, network equipment (including switches), and a small number of printers.
4. Covers work carried out by Alan Abbott to develop this OBC. Assumes that no FBC will be required because so much work has been done on this scheme already. However, if an FBC were required, it could be funded from contingency.

5.6.3 All the above figures include VAT @ 20%, where applicable. However, VAT recovery has been assumed against external non-works costs (which means that the financials in Figure 8 are now slightly lower than those shown in the Estates Cost Plan).

5.6.4 Please also note that these capital costs exclude the provision of MetaVision for Neurosciences (see Appendix D) and the NHS related works required on E Floor at RHH (to be sponsored as part of the ongoing Laboratories Rationalisation Project).

## **5.7 Ward Refurbishment Plan**

- 5.7.1 Whilst appreciating that the capital costs are high, there is an offset to be taken into account.
- 5.7.2 Within the Trust's Capital Programme each year there is a ring-fenced sum for ward refurbishments. This is currently £3.5m and, in terms of RHH wards, K1 and K2 were due to be refurbished next. It would be reasonable to assume a likely cost of £1.5m per refurbishment in the FY 2011/12 programme, although one of these wards would most probably have straddled into FY 2012/13.
- 5.7.3 Therefore - without the proposed new critical care unit – the Trust would have spent a total of £3m on K1 and K2 across 2011/12 and 2012/13 anyway. This being so, Julie Wright has confirmed that - across the whole capital programme for those two years - it is reasonable to view this as a compensatory (although not cash releasing) saving of £3m.

## **5.8 GE Patient Monitors**

- 5.8.1 There is a similar offset to be taken into account with regard to equipment.
- 5.8.2 This is because both the 6 existing GE patient monitors in general critical care and the 19 patient monitors in neuro already need replacing. All the general critical care monitors and 84% of the neuro critical care monitors are over 10 years old, rendering them obsolete with manufacturers unable to guarantee maintenance.
- 5.8.3 However, none of these 25 patient monitors currently forms part of any replacement programme. Without this business case they would therefore have needed replacement in a phased way by now anyway. This would have had to include the items under 10 years old for compatibility reasons, and also because they do not meet new industry standards for safety. However, this replacement process was deferred because of (1) the advent of the K Floor scheme, and (2) the related opportunity for Neurosciences to put forward a case for MetaVision, which requires different monitors for reasons of compatibility.
- 5.8.4 In principle, it would have fallen to MEMG to fund the 25 replacement monitors (with the K Floor scheme remaining responsible for funding the new monitors needed to bring the total up to the 29 required to equip the full infrastructure). But any division of responsibility is somewhat academic, because the cost would still fall on the Trust no matter who pays. Including VAT, the unit price of a GE monitor is £20,400. Therefore it is reasonable to view this situation as a compensatory (although not cash releasing) saving of £510k.

## **5.9 Further Observations On Capital Costs**

- 5.9.1 Over past months the Project Team has taken vigorous action to review the scale of the equipment costs. This work has been successful, and these costs have now been reduced from £4.1m to £1.8m. Consequently, it seems unlikely that any further reductions can now be achieved with regard to the capital costs without disproportionate effort.
- 5.9.2 There is no capital funding earmarked for this scheme. Therefore the Trust is asked to make a provisional allocation of £7.7m in the Capital Programme across FY 2010/11 and 2011/12.

## **5.10 Non-Recurrent Revenue Costs**

- 5.10.1 There are no non-recurrent revenue costs, and it has been agreed that there are no pre-recruitment costs associated with this scheme.

- 5.10.2 There will be some training time needed for ward staff, but this is not a major issue and will be generated from within existing resources.
- 5.10.3 However, there **will** be non-recurrent revenue costs (£67k) associated with user training for MetaVision, if Appendix D is approved.

## 5.11 Incremental Recurrent Revenue Costs

- 5.11.1 These are estimated to be as follows:

**Figure 9 – Incremental Recurrent Revenue Costs**

Owner	Item	Costed Option 1 (26 beds)	Costed Option 2 (27 beds)	Costed Option 3 (29 beds)	Comments
<b>Neurosciences</b>	Staffing & non-pay costs	£402,733	£561,512	£878,793	See Note 1
<b>OSCCA</b>	Staffing & non-pay costs	£0	£0	£0	See Note 2
<b>Support</b>	Reduced University Cost Share	£9,975	£9,975	£9,975	See Note 3
	Estates/Energy Costs	£9,850	£9,850	£9,850	See Note 4
	Estates Equipment Maintenance Costs	£32,170	£32,170	£32,170	See Note 5
	Clinical Engineering (BME) equipment maintenance Costs	£75,000	£75,000	£75,000	See Note 6
	Storeroom staffing costs	£0	£0	£0	See Note 7
	IT Services costs	£18,778	£18,778	£18,778	See Note 8
	Domestic Services	£102,628	£102,628	£102,628	See Note 9
	<b>Sub-Total</b>	<b>£651,134</b>	<b>£809,913</b>	<b>£248,401</b>	
	Capital Charges	£628,952	£628,952	£628,952	See Note 10
	<b>TOTAL</b>	<b>£1,280,086</b>	<b>£1,438,865</b>	<b>£1,756,146</b>	

### Notes:

1. Cost estimate provided by Andy Lowe. Ward element completed in conjunction with Una Cunningham. See Appendix F.
2. Is Nil. Cost estimate provided by Joanna Myers. There will be no incremental revenue costs incurred by OSCCA, because the same number of beds will be moving to K Floor as currently exist in SHDU on A Floor (ie 6 beds).
3. Cost estimate provided by Jenny Rutledge. Refers to the recurrent revenue foregone as a result of taking back rooms K134/136/137 from the University. See Appendix H.
4. Cost estimate provided by Jenny Rutledge. See Appendix H.
5. Cost estimate provided by Stuart Hindmarch and Dave Marshall. Refers to the estates maintenance costs for additional items of non-medical equipment, ie beyond those already installed and currently being maintained by the Estates Directorate. Where old equipment is being replaced by new equipment, no charge is made. See Appendix H.
6. Cost estimate provided by Dave Guymer and Chris Monk. VAT is not applicable. Refers to the maintenance costs for those items of medical equipment which are a completely new requirement, bearing in mind that maintenance contracts are already in place for those existing items of medical equipment which can be transferred to K Floor. See Appendix H.
7. Is Nil. Cost estimate provided by Jacky Rawlins. See Appendix H.
8. Cost estimate provided by Carol Hudson. See Appendix H.
9. Cost estimate provided by Andy Lowe and Gillian Thirsk. See Appendix H.
10. Cost estimate provided by Jenny Rutledge. See Appendix H.

- 5.11.2 These revenue costs will be partially offset by the cost savings and additional incremental income which will be described in later Sections below.



5.11.3 It should be noted that these revenue costs do not address the concern raised by Dietetics that the dietetic support to the existing neuro beds falls short of national standards by 0.75 wte. It is assumed, however, that dietetics will receive their TIFF share of any growth.

## **5.12 Outstanding Issue Concerning Post-Reconfiguration Budgets**

5.12.1 There has been considerable discussion about the way in which the incremental recurrent revenue costings for Estates/Domestic Services have been arrived at.

5.12.2 By way of clarification, please note that the General Surgery beds and offices that were on K Floor have moved to a variety of locations across the Trust which were previously either vacant or occupied by other services. At the time of writing, this reconfiguration process has been assumed to be on a revenue neutral basis with regard to (for example) domestic services.

5.12.3 It has also been assumed that the business case for the re-use of R Floor will have - or should have - included any additional costs incurred by Estates/Domestic Services. This is because the present OBC has claimed the savings which flow from having vacated R Floor, which means that the incoming Clinical Skills Unit will have to factor these costs into its revenue plan when occupying the vacated areas.

5.12.4 Nevertheless, it is recognised that ongoing work will be required in order to unravel all the moves caused by service reconfiguration and determine whether appropriate budgets need to be adjusted as a consequence. In particular, there is merit in taking a wider Trust view of these matters, as distinct from the necessarily partisan approach of the directorates involved in developing this OBC.

## **5.13 Activity Levels At NGH Critical Care Unit**

5.13.1 Before identifying what incremental cost savings can be achieved, it is useful to understand certain underlying assumptions derived from analysis of activity at the NGH Critical Care Unit.

5.13.2 The outcome of the activity analysis is that following the closure of R Floor, the NGH Critical Care Unit will be organised to accommodate the following:

- 14 x Level 3 (ITU) beds, but flexing between 13 and 15 beds during the year<sup>1</sup>.
- 12 x Level 2 (HDU) beds open for 7 nights (10 on E Floor, 2 on D Floor), plus 8 x Level 2 beds open for 5 nights. However OSCCA will monitor the need post-reconfiguration to increase the number of beds open over the weekend (in order to accommodate fluctuations in theatre activity, because modelling has only been based on averages).
- There are currently 12 x F2 doctors supporting the POSU component of Level 2 care across the city, ie 7 at RHH and 5 at NGH. In the interim arrangements, 7 are required to remain on A Floor at RHH. However, following the closure of A Floor and opening of K Floor, the 7 x F2 doctors will no longer be required at RHH.

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<sup>1</sup> There is an assumption that - at the point of reconfiguration in November 2010 - OSCCA will have 15 ITU beds at NGH. This is as a result of transferring the 3 x ITU beds directly associated with reconfiguration (which, when added to the existing 11 x ITU beds at NGH, makes a total of 14). In addition, instead of releasing the resources associated with the 6<sup>th</sup> RHH ITU bed (which was repatriated to neuro), those resources have been transferred to NGH to pump-prime the flexible working needed to fluctuate between 13 and 15 beds. This pump-priming, and the resources associated with it, will be released in April 2011 (see Note 4 to the Table in Appendix G).

But should there be an increased need at NGH post-reconfiguration for the 8 x 5 night beds to become 8 x 7 night beds, due to changes in operating practice and length of stay, we would need to increase the 5 doctors at NGH to a minimum of 7. OSCCA will have to monitor this. Hence there will be an overall saving of the out of hours component of 5 x F2 posts.

- Post-reconfiguration there will be a comprehensive review of activity and capacity at the NGH Critical Care Unit.
- Consultant cover is within the current capability at NGH, although overall there will be a reduction of 6.25 Programmed Activities, due to the closure of R Floor.

5.13.3 Hence these are the assumptions which underpin the OSCCA cost savings shown below.

## 5.14 Incremental Cost Savings

5.14.1 These are estimated to be as follows. They remain the same irrespective of which Option is chosen as the preferred solution. For further details, please see Appendix G.

**Figure 10 – Incremental Cost Savings**

Owner	Item	Option 1 (26 beds)	Option 2 (27 beds)	Option 3 (29 beds)	Comments
<b>Neurosciences</b>	None available	£0	£0	£0	See Note 1
<b>OSCCA</b>	Initial staffing savings	£137,525	£137,525	£137,525	See Note 2
	Long term staffing savings	£236,500	£236,500	£236,500	See Note 3
	Long term Consultant savings	£75,000	£75,000	£75,000	See Note 4
	Long term F2 doctor savings	£56,805	£56,805	£56,805	See Note 5
	Non pay savings	£2,100	£2,100	£2,100	See Note 6
<b>Support</b>	None available	£0	£0	£0	See Note 7
	<b>TOTAL</b>	<b>£507,930</b>	<b>£507,930</b>	<b>£507,930</b>	

### Notes:

1. Is nil, because the number of neuro critical care beds is increased, and the floorspace occupied is also being increased. Therefore there are no cost savings.
2. Estimate provided by Joanna Myers in conjunction with Cath Bailey and Julie Whitaker. 'Initial' means on closure of R Floor. Predominantly relates to clinical support worker savings. This equates to 5.6 wte support workers, 0.5 Band 7, and 0.5 ward clerk.
3. Estimate provided by Joanna Myers. 'Long-term' means after the opening of K Floor. Is saving of one housekeeper and one ward clerk as a result of pooled resources with Neurosciences, plus staffing savings for one further Level 3 bed in April 2011, although there is still some discussion about the exact timing of the latter.
4. Relates to a reduction of 6.25 Consultant PAs due to the closure of R Floor. This comes about because the Trust has 2 consultants covering the RHH general critical care beds at present but when this reduces to 6 beds, only one consultant will be required. The transfer of beds to the NGH will be absorbed within the current Consultant complement there, thus releasing 6.25 PAs from RHH.
5. Estimate provided by Joanna Myers. Is the out of hours component of 5 x F2 doctors that is currently paid for by STH. The training component from the Deanery will remain, because the 5 posts transfer to Anaesthesia. There is no opportunity to lose these posts altogether, because they are held by doctors under training on rotation which does not end until 2014, at which point the position will be reviewed. Hence it is impossible to predict the outcome at this distance.
6. Non-pay savings are limited since patient numbers are not expected to reduce.
7. Is nil, because the domestic services savings on A and R Floors have already been reflected as an abatement to the costs shown in Figure 9.

- 5.14.2 The above table shows the cost savings that are likely to be achieved on the basis of current knowledge.

## 5.15 Tariff Issues

- 5.15.1 Before identifying the additional incremental income that can be expected from the proposed new unit, it is necessary to discuss certain issues concerning the tariff.

- 5.15.2 In recent years up to and including FY 2010-11, critical care units have been funded on the basis of the number of patient nights in each facility. This night count is based on the midnight bed state recorded on PAS. This means that a patient admitted at 11pm and discharged at 6am from a critical care unit will register one night even though they have been in the unit for only 7 hours. Conversely, a patient admitted at 3am and discharged at 9pm will not register a bed night, even though they have spent 18 hours in the facility, because they were not in bed at midnight.

- 5.15.3 For FY 2011-12 we have been notified by the DoH PbR Team that the intention is to mandate the contracting of critical care units on the basis of the Critical Care Minimum Data Set (CCMDS) priced at a local rate. This records the number of organs supported by day for patients in critical care units. In addition, the mechanism of counting days under the CCMDS is such that a day is counted if a patient has had any part of a 24 hour period in a critical care unit. For example, a patient admitted at 11pm and discharged at 6am would therefore register 2 days (as against one in the current system).

- 5.15.4 The current counting system is simple to run and administer as the data is extracted easily from PAS. In contrast, the new system requires clinical judgements being made about organs supported and requires mechanisms in place to record both this and the number of CCMDS days. Whilst there has been a requirement to record this data for some years, in some STH critical care facilities, such as the General ITU and HDU, more progress has been made in developing the recording of this data than in others. In passing, it should be noted that the data quality issue with currently collected organ supported data highlights the importance of equipping neuro critical care with MetaVision (see Appendix D) in order to ensure full reimbursement of activity, when this new payment basis is implemented. In neuro the data currently collected in relation to organs supported is manually obtained, not complete, and of dubious quality. Whilst this has not mattered historically, in the future it will be absolutely essential.

- 5.15.5 It follows that the Trust's historical CCMDS data will not in all cases be complete or correct. As such, this presents problems in applying historical CCMDS costs to assess the financial viability of any future critical care development.

- 5.15.6 Looking further ahead, Section 3.18 of the recent White Paper entitled *Liberating the NHS* states that the DoH will ".....mandate in 2011/12 national currencies for adult and neonatal critical care". The wording in the White Paper implies that in the short-term local prices will still apply, but the currency will be on the basis of number of organs supported per day. The detailed local tariffs for days of organ support that will apply in FY 2011/12 cannot yet be easily derived, and there are data quality issues with the organ supported data. In discussion with Andrew Watson (Costing and Contracting Accountant), it has been agreed that the transition to the new currency should be revenue neutral compared with the previous bed night currency.

- 5.15.7 Accordingly, it has further been agreed to calculate the additional incremental income (shown below) based on the local bed night rate that is expected to apply in FY 2011/12. This is derived from FY 2008/09 Reference Costs.

5.15.8 Finally, under the recently implemented contractual arrangement with commissioners the Trust only receives reimbursement for activity over-performance on all critical care at 20% of the local tariff rate. It is therefore essential that the activity targets are increased appropriately, including the appropriate part-year effect in FY 2011/12, to ensure that the additional income is received at the full rate.

## 5.16 Additional Incremental Income

5.16.1 No growth is anticipated in OSCCA income, because the number of general critical care beds at RHH will remain the same as now (6 beds), as will the overall number of general critical care beds across both sites (41 beds). As an aside, however, there will be a small reduction in both target and income, because OSCCA will lose the overspill of activity from neuro to R Floor which is being 'repatriated' (see Section 3.10.11 above). This will need to be negotiated with commissioners very soon as it will impact from November 2010 onwards. Projected figures for FY 2010/11 suggest that the transfer of target from general to neuro should be based on 127 x Level 3 bed nights and 17 x Level 2 bed nights.

5.16.2 In contrast, a modest growth in neuroscience critical care activity is expected for two reasons, first because of the prevailing rate of growth in neuroscience which reflects increasingly complex workload, and second because the 'overspill' of neuroscience activity into general beds will no longer occur. This additional income can be priced up as follows: In the current FY 2010/11 SLA with commissioners, the cost per bed night for NITU is £1,169 and for NHDU is £587. That said, for the reasons explained in more detail in Section 5.15 above, it is more appropriate to use the expected value for FY 2011/12 which is based on 08/09 Reference Costs. This will be the rate for additional income that is received when the new unit opens. These values are currently showing £1,418 for NITU and £678 for NHDU<sup>2</sup>.

5.16.3 With this mind, the additional incremental income for Neurosciences is estimated by Andy Lowe to be as follows:

**Figure 11 – Additional Incremental Income**

	Option 1 (26 beds)		Option 2 (27 beds)		Option 3 (29 beds)	
	1 extra NITU		1 extra NITU 1 extra NHDU		1 extra NITU 3 extra NHDU	
	NHDU	NITU	NHDU	NITU	NHDU	NITU
Gross Income assuming 85% occupancy:	Nil	£439,934	£210,349	£439,934	£631,048	£439,934
Less TIFF shares required:						
MIMP		-£3,372	-£712	-£3,372	-£2,136	-£3,372
Prof Services		-£2,014		-£2,014		-£2,014
Labs		-£4,637	-£1,037	-£4,637	-£3,110	-£4,637
OSCCA (Note 1)		-£59,342		-£59,342		-£59,342
Balance	Nil	£370,569	£208,600	£370,569	£625,802	£370,569
<b>Total Net Contribution of each Option to the Revenue Costs</b>		<b>£370,569</b>	<b>£579,169</b>		<b>£996,371</b>	

<sup>2</sup> The values in the 09/10 Reference Costs are £1,173 for NITU and £577 for NHDU. However, it would not make sense to use these values to calculate the incremental income since they would inform 2012/13 income if the current mechanism remained, but in reality it is expected that by then a National Tariff will apply.

**Notes:**

1. The OSCCA TIFF share broadly represents the input of the General Critical Care Medical Staff to the current Neuro ITU & HDU beds. Discussions around the future level of input are still ongoing, and so at this stage it is assumed that the current levels of input will continue and that the OSCCA TIFF share will remain the same.
2. The actual balance between NITU and NHDU will be reviewed and confirmed nearer to the point of commissioning, once the impact of both reconfiguration and the new stroke pathway has settled and been fully evaluated.

**5.17 Affordability**

5.17.1 The net revenue position is shown below.

**Figure 12 – Affordability of Incremental Revenue Consequences**

	<b>Option 1 (26 beds)</b>	<b>Option 2 (27 beds)</b>	<b>Option 3 (29 beds)</b>
Gross Incremental Recurrent Revenue Costs	£1,280,086	£1,438,865	£1,756,146
Cost Savings	-£507,930	-£507,930	-£507,930
Additional Incremental Income	-£370,569	-£579,169	-£996,371
<b>Total Net Incremental Revenue Cost of Each Option</b>	<b>£401,587</b>	<b>£351,766</b>	<b>£251,845</b>

5.17.2 There is clearly an affordability gap. Given that every effort must be made to improve affordability, the gross incremental revenue costs of Option 3 (£1.75m) seem too high unless the projected additional income can be assured. In this context, Appendix A has already shown that activity levels do not justify 29 beds. Consequently, those beds would be under-used, and the estimated additional incremental income would fail to materialise, thus making the gap even worse. For these reasons, Option 3 is ruled out at this point and will not be considered any further.

5.17.3 Instead, Option 2 (27 beds) will - at most times - meet the Trust's activity needs. However, it would also be possible for STH to manage with slightly less.

5.17.4 In particular, Option 1 (26 beds) would be viable for a large part of the week, although there would be insufficient NHDU capacity on some occasions. This option would be acceptable, provided that there was a willingness – as per current practice - to cope with occasional shortfalls by (1) allowing refusals, (2) cancelling electives, and/or (3) transferring patients between sites. These shortfalls would be mitigated as far as possible by having a flexible workforce and operational plan to maximise resources.

5.17.5 This initial review of affordability has concluded that Option 3 is too risky and should be ruled out. However, both Options 1 (26 beds) and 2 (27 beds) are potentially sound. Therefore they are now carried forward into the Financial Appraisal.

**5.18 Financial Appraisal**

5.18.1 A financial appraisal has been conducted, based on the 2 remaining costed options, and the results are summarised next:

**Figure 13 – Appraisal Summary**

Option Description - Base Case	Costed Option 1 (26 beds)	Costed Option 2 (27 beds)
Benefit Points	450	465
Net Present Value	3,616.3	2,403.5
NP Value per Benefit Point	8.04	5.17
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>

5.18.2 As expected, Option 2 is ranked first. However, it needs to be probed further.

## 5.19 Sensitivity Analysis

5.19.1 In order to test the robustness of the financial analysis, key variables were subjected to sensitivity analysis. These were:

- Variation in capital costs by plus or minus 10%.
- Variation in revenue costs by plus or minus 10%.
- Variation in additional income by plus or minus 10%.

5.19.2 The results are shown overleaf (where the lowest NPV is best). It is assumed that:

- There is no VAT element included within the non-pay section of *Incremental Recurrent Revenue Costs* and *Incremental Cost Savings*. Long-term savings will begin on 1 April 2011 but be fully realised from 1 January 2012 onwards. Further price increases will be in line with the NHS inflation rate.
- There may be some double-counting in Appendix H between *Reduced University Cost Share*, *Estates/Energy Costs*, and *Estates Equipment Maintenance Costs*. This needs investigation.

**Figure 14 – Sensitivity Analysis**

Option Description	Costed Option 1 (26 beds)	Costed Option 2 (27 beds)
<b>Capital Costs increase by 10%</b>		
Benefit Points	450	465
Net Present Value (NPV)	4,560.5	3,347.7
NPV per Benefit Point	10.13	7.20
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>

Option Description	Costed Option 1 (26 beds)	Costed Option 2 (27 beds)
<b>Capital Costs decrease by 10%</b>		
Benefit Points	450	465
NPV	2,672.1	1,459.3
NPV per Benefit Point	5.94	3.14
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>
<b>Revenue Costs increase by 10%</b>		
Benefit Points	450	465
NPV	3,935.8	3,109.6
NPV per Benefit Point	8.75	6.69
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>
<b>Revenue Costs decrease by 10%</b>		
Benefit Points	450	465
NPV	3,296.8	1,697.5
NPV per Benefit Point	7.33	3.65
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>
<b>Additional Income increases by 10%</b>		
Benefit Points	450	465
NPV	2,714.3	993.7
NPV per Benefit Point	6.03	2.14
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>
<b>Additional Income decreases by 10%</b>		
Benefit Points	450	465
NPV	4,518.4	3,813.4
NPV per Benefit Point	10.04	8.20
<b>Rank in Financial Appraisal</b>	<b>2</b>	<b>1</b>

5.19.3 From this, it can be seen that Option 2 (27 beds) is ranked first in all scenarios.

- 5.19.4 However, the reason for this largely lies in difficulties surrounding the financials, because there are too many fixed elements. In particular, the capital costs (and hence capital charges) have not been realistically modelled to reflect the price differential between 26 and 27 beds.
- 5.19.5 In effect, this means that sensitivity assessments are largely being made on the basis of only 2 variables. These are the additional neuro nurse staffing cost and the additional income, both of which are dependent on the number of beds in use. The overall situation could easily change in future due to better knowledge of tariff prices, more refined costings, or new policy guidance from Trust directors.
- 5.19.6 In conclusion, the case in favour of Option 2 (27 beds) is persuasive because it provides sufficient capacity to meet most activity needs. But from a financial perspective, the gross incremental revenue costs incurred (£1.43m) might be a step too far whilst so many underlying assumptions are still potentially changeable. Also, the income projection for Option 2 is based on 85% occupancy which is optimistic. Consequently, this is a very difficult judgement call, but instinctively it seems preferable to err on the side of caution.
- 5.19.7 For these reasons, there is a strong rationale for adopting Option 1 (26 beds), which would be viable for a large part of the week, although there would be insufficient NHDU capacity on some occasions. As already stated above, this option would be acceptable, provided that there was a willingness to cope with occasional shortfalls by (1) allowing refusals, (2) cancelling electives, and/or (3) transferring patients between sites.

## **5.20 Preferred Solution**

- 5.20.1 Therefore this OBC recommends that the proposed new unit should be staffed for 26 beds but equipped for 29 beds, because it is less risky and more affordable in terms of gross incremental revenue costs.
- 5.20.2 This solution is entirely compatible with the planned Build Works for the K Floor Scheme. In practice, the Estates Directorate would go ahead and install all the fixed infrastructure and equipment for the maximum physical number of 29 beds. This would ensure a well-equipped shell capable of being expanded, if the extra 3 beds are eventually required (although a separate business case would be needed to justify this at the time).
- 5.20.3 The detail of this solution would have to be approached in a careful, pragmatic and balanced way. For example, pendants would be needed for all 29 beds in order to ensure delivery of essential services, but there would be scope to modify the exact model of pendant procured for (say) the Level 2 beds in order to lower the cost. Conversely, economies of scale might mean that it is actually cheaper to place a bulk order for 29 patient monitors, although only 26 will be used by staff in the first instance.
- 5.20.4 In this way, the Trust would aim to save as much cost as possible by opening the proposed new unit by staffing only 26 beds, whilst preserving the capability to expand to 29 beds, if justified at a later date.

## **5.21 Risk Analysis**

- 5.21.1 This is a medium risk project, because of the difficulties encountered in preparing this OBC.
- 5.21.2 A Risk Analysis has been carried out, and the key points are shown overleaf:



**Figure 15 – Risk Analysis**

#	Risk	Mitigation
R1	The viability of the revenue plan may be difficult to justify.	There is financial risk because this project is about re-providing an existing service but doing so whilst achieving essential quality improvements. Consequently, there will be very little new income, and great care will need to be taken when apportioning revenue costs.
R2	The project may be impacted by the limited availability of capital.	Every effort is being made to keep the capital costs as low as possible, given the present financial climate.
R3	The constraints of physical capacity on K Floor may limit the Trust's ability to fully comply with HBN 57.	The physical constraints are well recognised, and every effort will be made to achieve the best possible level of compliance.
R4	The constraints of physical capacity on K Floor mean that there is limited scope for expansion of the unit.	At design stage, the architects have worked as creatively as possible to (1) maximise the number of bed spaces possible, and (2) concentrate on clinical priorities.
R5	The physical constraints of floor layout on K Floor mean that the design of the unit is compromised.	The architects have worked with the clinicians to ensure the optimum design within the space available, and the sickest patients will be concentrated where they can receive the best attention.
R6	Flexible and co-operative working relationships will be essential to the success of this shared unit. If this is not achieved, there will be poor bed utilisation, leading to a financial deficit.	Noted. Trust directors are aware and will be seeking assurances that these concerns have been resolved before the proposed new unit opens.
R7	There is a clinical risk arising from temporary peaks in demand, which may place extreme pressure on bed availability.	High level clinical engagement will be needed to prioritise the use of beds. Also, there will be a need for clear clinical protocols to cover when it might be appropriate to transfer patients to the NGH.
R8	The University currently occupies certain areas of the K Floor Tower. Discussions have been held, and there is agreement in principle about this space being released.	Every effort has been made to secure the accommodation required for the scheme. If there were to be any unforeseen complications compromising this agreement, it could result in a shortfall and the need to find an alternative nearby location.
R9	The noise of building work may interfere with patient care on nearby floors and cause stoppages, thus resulting in delay and additional cost.	Particular efforts will be made to ensure good communications with the occupants of J and L Floors. J1 is a decant ward, and J2 will be a medical ward. L Floor belongs to the Neurosciences Directorate and will therefore be well-disposed to appreciate the importance of this scheme.
R10	If the proposed new unit is to operate on the basis of the organ supported, then some Neuro patients will occupy OSCCA beds, and some OSCCA patients will occupy Neuro beds. This represents a longer-term financial risk.	Noted. Will be kept under close review by Financial Managers.

## 5.22 Commissioner Support

- 5.22.1 It has been agreed with the STH Contract Consortium that the implementation of the service reconfiguration changes will not result in any increase in cost for commissioners during FY 2010/11. These changes substantially relate to services which are covered by national tariff prices and will not result in a material reduction of capacity in any non-tariff services.
- 5.22.2 However, service reconfiguration does enable the re-development of critical care facilities at RHH. Therefore the Trust has notified the Consortium that it intends to bring forward a business case to replace the General Critical Care Unit and the Neuro Critical Care Unit on the RHH site. The proposal will set out the risk factors driving this development, changes to the location of beds, the intended number of beds in the new facility, and the impact on local prices for the services affected.
- 5.22.3 The Consortium has agreed to consider this business case as described in Sections 5.22.1 and 5.22.2 above. Planning and Contracting representatives from both Service Development and Finance are closely involved in the preparation of this case and will present it to the Consortium in due course.
- 5.22.4 However, an early indication of the likely response was received in a letter from Alastair Hill, Assistant Director, Contract Performance, NHS Sheffield, on 28 September 2010. The relevant extract is as follows:
- “Our one concern (about service reconfiguration) relates to the proposal to develop a new critical care unit on the RHH site. Chris Linacre’s letter to John Challenger is very explicit that a new unit will open during 2011, and I do need to restate the position on this from our perspective. We have not yet had any detailed discussions with the Trust about the proposed development. Although we will certainly consider a business case when one is put forward, we cannot offer any pre-commitment that this will be approved. In the current financial climate, anything which involves an overall increase in PCT expenditure is clearly likely to be problematic, as I am sure you will understand. In this context, it may be helpful for us to have an early discussion about how the critical care proposal and business case is taking shape.”
- 5.22.5 Accordingly, the STH Contracting Team has opened negotiations and will discuss this OBC with commissioners from mid-November 2010 onwards. However, it is unlikely that these negotiations will be concluded until March 2011 at the earliest, because they will almost certainly become subsumed into the Trust’s overall contract settlement.

## 5.23 Optional Additional Investments

- 5.23.1 There are two optional additional investments, which - strictly speaking - are new developments. These are therefore shown in Appendices, so that their costs can be clearly and discretely identified.
- 5.23.2 First, Appendix D describes how the neuro critical care beds could be brought up to the same standard as the general critical care beds by equipping them with the MetaVision Clinical Information System.
- 5.23.3 Second, Appendix E describes how neuro critical care could be brought up to the same standard of pharmacy service as general critical care by improving staffing and equipment.
- 5.23.4 Although shown as optional for accuracy of presentation, these investments are perceived by clinicians as essential in order to enable the proposed new unit to function

as a single cohesive organisation. The additional costs - which represent significant improvements in clinical quality and patient care but are currently unfunded - are shown below:

- **MetaVision.**
  - Capital Costs: £226k.
  - Non-Recurrent Revenue Costs: £67k.
  - Incremental Recurrent Revenue Costs (including capital charges): £145k.
- **Pharmacy.**
  - Capital Costs: £20k (or equivalent revenue cost, if leased).
  - Non-Recurrent Revenue Costs: Nil.
  - Incremental Recurrent Revenue Costs (including capital charges): £91k.

5.23.5 In considering these additional investments, it should be noted that the capital costs of the core critical care scheme have now been reduced to under £8m, such that sufficient headroom remains to fund the capital costs of MetaVision (£226k) if the capital budget were set at £8m, and if the Trust Board were minded to adopt this approach. However this still leaves outstanding the issue of the recurrent and non-recurrent revenue costs, and there is as yet no solution for these. The advantage of this approach is that it offers the opportunity for the Trust to equip Neurosciences with a highly desirable MetaVision capability as part of the core capital scheme, whilst leaving the revenue funding for further discussion. In other words, having acquired the capability, the Trust would be able to activate it at a later date, ie once the issue of affordability has been satisfactorily resolved.

5.23.6 As regards the need for an improved pharmacy service, it is fully recognised that further work needs to be done to understand the benefits. Therefore this OBC presents what is currently known about the desired improvements, so that the foundation is laid for the future direction of travel. If a better developed case materialises over the coming months, ie one which successfully addresses the revenue costs, it would be open to the Trust to fund the capital costs (£20k) within the contingency allowance of the core scheme.

## 5.24 Summary

5.24.1 The capital costs of the core scheme are currently estimated at £7.7m.

5.24.2 After cost savings and additional income are taken into account, the net incremental recurrent revenue costs are estimated at £402k (including capital charges). This is the worst case. If capital charges could be removed from the equation, the scheme would be revenue-positive.

5.24.3 In order to limit the Trust's financial risk, it is recommended that the proposed new unit should open with 26 beds but be equipped for 29 beds (which is the maximum number that the physical infrastructure is capable of accommodating). This would leave scope to flex in response to circumstances.

5.24.4 The 2 optional additional investments are costed separately at Appendixes D and E.

## **6 COMMERCIAL CASE**

- 6.1.1 This Section considers whether the marketplace can meet the Trust's requirement in a competitive way.
- 6.1.2 Procure 21 will not be used. Instead, the Estates Directorate has advised that procurement of the building works will take place via a mini-competition within the STH contractors panel framework agreement. This will provide a market price for the works from a contractor who has gone through a rigorous selection process and has a long term commitment to working with the Trust.
- 6.1.3 Major equipment will be purchased through STH Supplies Department to ensure that best value is achieved, and to allow financial savings to be passed directly through to the Trust.
- 6.1.4 For these reasons, it is concluded that the commercial arrangements are sound and comply with Trust SFIs.

## **7 MANAGEMENT CASE**

### **7.1 General**

7.1.1 This Section considers whether the necessary management expertise exists within the Trust to successfully deliver the project and achieve the expected benefits.

### **7.2 Capital Budget Holder**

7.2.1 The capital budget holder will be Stuart Hindmarch on behalf of Phil Brennan, Estates Director.

### **7.3 Project Methodology**

7.3.1 The project will be managed in accordance with PRINCE2 principles.

### **7.4 Programme Board**

7.4.1 The project will form part of the Service Reconfiguration Programme and be managed by the existing Programme Board. The latter is chaired by Dr Mike Richmond, supported by Chris Linacre. Accordingly, they jointly constitute the Project Owner.

### **7.5 Project Board**

7.5.1 The present Business Case Project Board chaired by Sarah Anderson will continue for the time being.

7.5.2 However, a new Project Board will be formed after approval of the business case, as shown at Appendix I. It will be chaired by Dr Graham Venables and include:

- Executive Representative: Julie Ward.
- User Representative (Neuro): Dr Stefan Jankowski, supported by Carolyn Wilkie.
- User Representative (General CC): Dr Stelios Michael, supported by Jacky Rawlins.
- Supplier Representative: Stuart Hindmarch.
- Nurse Director (Neuro): Una Cunningham.
- Nurse Director (General CC): Julie Whitaker.
- Capital Finance Representative: Sam Hardman.
- Management Accountant (Neuro): Andy Lowe.
- Management Accountant (General CC): Joanna Myers.
- Service Development Representative (if required): Sarah Anderson.

7.5.3 Roles and responsibilities are well understood. Hence they do not need restating here.

### **7.6 Project Lead**

7.6.1 The Project Lead with overall responsibility for planning, co-ordinating and implementing the K Floor scheme is Jacky Rawlins (General Manager, OSCCA).

### **7.7 Project Manager (Design & Construction)**

7.7.1 The Project Manager for Design & Construction is Dean Morton (Senior Project Manager, Estates).

### **7.8 Project Manager (Implementation)**

7.8.1 The Project Manager for all Neurosciences implementation aspects is Gill Meek (Lead Nurse, Head & Neck Services).

## **7.9 Project Teams**

- 7.9.1 Project Teams will be formed to implement this scheme. The role and composition of these Teams is likely to change, depending on the nature of the work being undertaken. Their potential members are shown at Appendix I.

## **7.10 Benefits Realisation**

- 7.10.1 An established process for benefits management already exists within the Service Reconfiguration Programme.
- 7.10.2 The role of Benefits Manager for this scheme will be shared jointly by the Nurse Directors of Neurosciences (Una Cunningham) and OSCCA (Julie Whitaker).

## **7.11 Post-Implementation Review**

- 7.11.1 An evaluation review of the project will be conducted within 6 months of implementation in order to assess whether the benefits are being delivered and what lessons can be learnt.
- 7.11.2 This review will be carried out by Julie Ward in line with the recently issued Trust Capital Planning guidance.

## **7.12 Summary**

- 7.12.1 The necessary management framework and expertise already exists to ensure delivery.

## 8 CONCLUSION

8.1.1 This OBC is about re-providing an existing service in a way which achieves essential improvements in quality and thus contributes to successful completion of the Service Reconfiguration Programme.

8.1.2 Unless the K Floor scheme goes ahead on schedule, key stakeholders will not accept the planned interim critical care arrangements being prolonged beyond what is absolutely necessary, which is until 12 December 2011. Put simply, the Trust cannot function without a Critical Care Unit on the Central Campus which is fully fit for purpose.

8.1.3 Therefore the Trust is requested to:

- Approve this OBC.
- Make a provisional allocation of £7.7m in the Capital Programme across FY 2010/11 and 2011/12 (or £8m if MetaVision is included).
- Note the incremental recurrent revenue costs, which are as yet unfunded.
- Authorise the start of building works as soon as possible.
- Agree that the proposed new unit should open with staffing for only 26 beds but be equipped for 29 beds (which is the maximum number that the physical infrastructure is capable of accommodating).
- Note that the STH Contracting Team has begun negotiating the contractual arrangements for the proposed new unit, but that these negotiations will not be concluded until March 2011 at the earliest.
- Support additional investments for vital service improvements, ie by providing neuro critical care with the MetaVision clinical information system and noting the need for an improved pharmacy service.

8.1.4 It is recognised that a medium level of risk is involved, and that some financial aspects are weaker than normally desirable at this stage, but CIT is asked to view this OBC in the context of the wider needs of the Service Reconfiguration Programme.

8.1.5 At the time of writing, there are a small number of issues which need to be resolved whilst the building works are carried out. These are:

- Resolving the outstanding issue of post-reconfiguration budgets.
- Understanding the additional revenue costs incurred by Estates and Domestic Services in relation to K Floor.
- Achieving consensus regarding MetaVision and pharmacy.

8.1.6 Finally, the following framework is offered as a potentially helpful way of structuring discussion about this OBC:

- Is it desirable that the scheme should go ahead?
- Is it affordable?

- Can we go out to tender in December 2010, assuming Trust Board approval? If not, there will have to be agreement that the interim arrangements will need to remain in place for longer than originally envisaged.
- Are we likely to get commissioner support? If not, do we proceed at risk?
- What can be done to mitigate the impending tariff changes? Are our existing data collection systems adequate?
- Is there agreement to open with 26 beds? Do we accept that the actual balance of NITU and NHDU beds will be confirmed nearer to the point of commissioning?
- Is there support for the two optional additional investments, ie MetaVision and pharmacy?
- What arrangements can be made to fund the capital charges incurred by the K Floor scheme, such that it becomes revenue-positive?
- What else can be done to improve the revenue situation?
- Is there any further action that can be taken to mitigate the risks shown in Figure 15 (Risk Analysis)?
- What timetable should be established for ensuring that progress is made on the remaining issues? How best to review, control, and consolidate progress?
- Given the amount of time and effort sunk into this OBC already, is there anything to be gained by requiring an FBC in 2011?

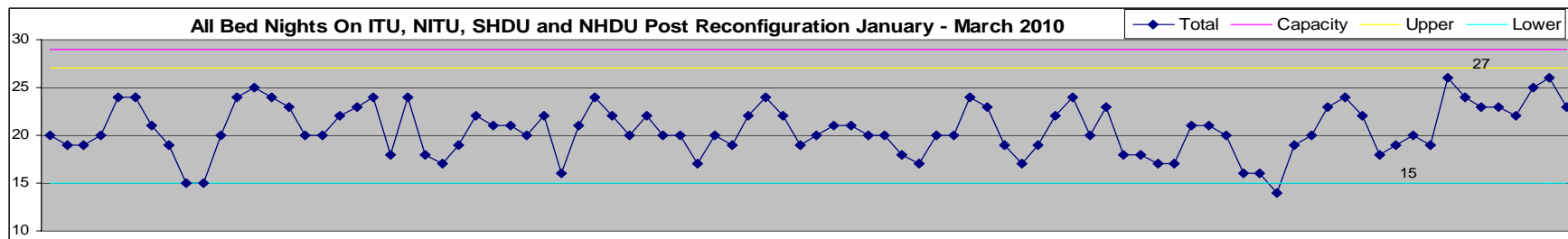
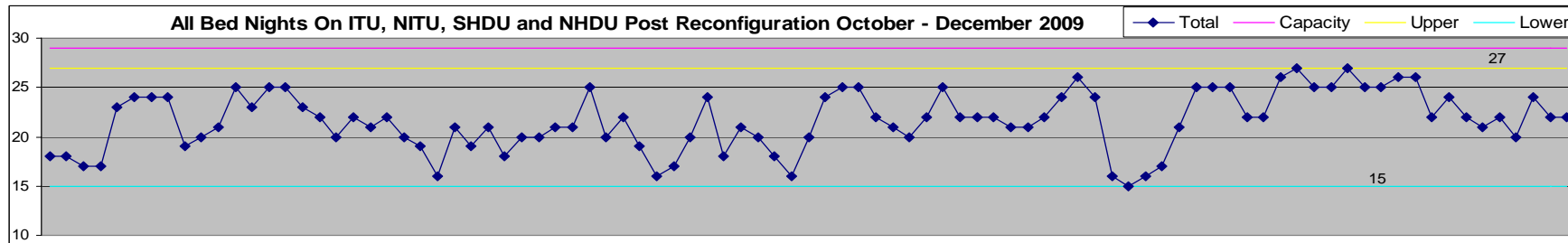
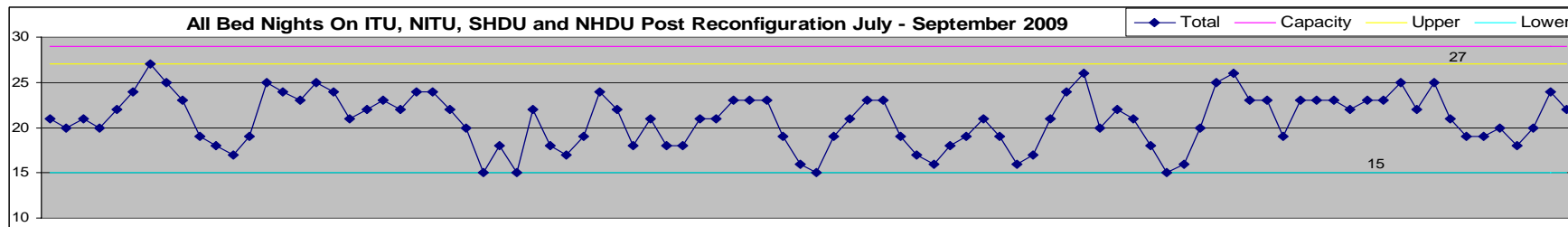
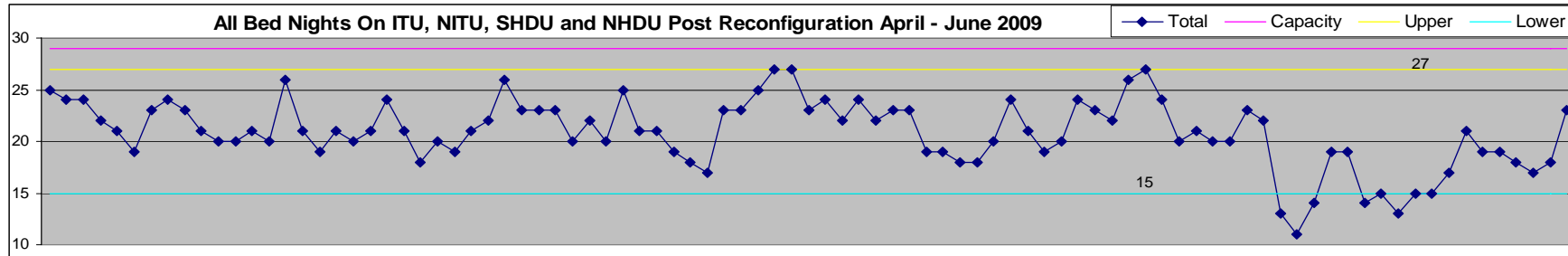


# Appendix A – Activity Table

RHH Critical Care Bed Days/Nights At 85% Occupancy – All data has been adjusted to reflect the post-reconfiguration situation. Although not shown here, data is also available (on request) as far back as FY 2004/05.

Ward	Activity 07/08				Activity 08/09				Activity 09/10 (assuming 85% occupancy)			
	Days Occupancy	Days Beds (85% occ)	Nights Occupancy	Nights Beds (85% occ)	Days Occupancy	Days Beds (85% occ)	Nights Occupancy	Nights Beds (85% occ)	Days Occupancy	Days Beds (85% occ)	Nights Occupancy	Nights Beds (85% occ)
ITU	690	2.23	607	1.96	838	2.70	717	2.31	848	2.74	699	2.25
HDU	1406	4.54	885	2.85	1433	4.62	867	2.80	460	1.48	351	1.13
NITU	2201	7.10	2169	7.00	2129	6.87	2106	6.79	1968	6.35	1706	5.50
NHDU	5352	17.26	4419	14.25	4864	15.69	3921	12.65	5476	17.66	4450	14.35
CCU-PPH	40	0.13	40	0.13	40	0.13	40	0.13	40	0.13	40	0.13
POSU									881	2.84	450	1.45
<b>Total</b>	<b>9689</b>	<b>31.25</b>	<b>8120</b>	<b>26.19</b>	<b>9304</b>	<b>30.01</b>	<b>7651</b>	<b>24.68</b>	<b>9673</b>	<b>31.20</b>	<b>7696</b>	<b>24.83</b>
Ward	Activity 09/10 (assuming 78% occupancy)				Occupancy at 85%				Occupancy % on Unit Size			
	Days Occupancy	Days Beds (78% occ)	Nights Occupancy	Nights Beds (78% occ)	Beds (when rounded up)	Bed Nights	Nights Occupancy	Night % Occupancy	Beds	Day % Occupancy	Beds	Nights % Occupancy
ITU	848	2.98	699	2.45	3	1095	699	63.84%	31	85.25	31	68.02
HDU	460	1.61	351	1.23	4	1460	841	57.60%	30	88.09	30	70.28
NITU	1968	6.91	1706	5.99	8	2920	1706	58.42%	29	91.13	29	72.71
NHDU	5476	19.21	4450	15.61	18	6570	4450	67.73%	28	94.38	28	75.3
CCU-PPH	40	0.14	40	0.14					27	97.88	27	78.09
CCU-Cardio									26	101.64	26	81.10
POSU	881	3.09	450	1.58					25	105.71	25	84.34
<b>Total</b>	<b>9673</b>	<b>33.94</b>	<b>7696</b>	<b>27</b>	<b>33</b>	<b>12045</b>	<b>7696</b>	<b>63.89%</b>	<b>24</b>	<b>110.11</b>	<b>24</b>	<b>87.85</b>
Ward	Excludes all night for refusals				Excludes only nights over bed complement				CCU Cardio Audit 11 Jan 10 - 28 Feb 10 showed current usage as one HDU bed @ 85% occupancy. However after reconfiguration Cardiology estimates a 50% reduction.			
	Assumes No Patients Over Maximum				Assumes No Patients Over Maximum							
Ward	Beds	Bed Nights	Nights Occupancy	Night % Occupancy	Beds	Bed Nights	Nights Occupancy	Night % Occupancy				
ITU	3	1095	653	59.63%	3	1095	674	61.55%				
HDU	4	1460	743	50.89%	4	1460	764	52.33%				
NITU	8	2920	1701	58.25%	8	2920	1703	58.32%				
NHDU	18	6570	4450	67.73%	18	6570	4450	67.73%				
<b>Total</b>	<b>33</b>	<b>12045</b>	<b>7547</b>	<b>62.66%</b>	<b>33</b>	<b>12045</b>	<b>7591</b>	<b>63.02%</b>				

### Appendix B – Activity Run Chart



## Appendix C – Outline Implementation Plan

The proposed plan is shown below.

**Please note that Serial Nos 1-6 have already been completed.**

#	Date	Event	Detail
1	Jan - March 2010	Design Team appointed.	<ul style="list-style-type: none"> <li>Appraisal - Stage 1</li> </ul> <p><i>Identification of Client's requirements and any possible constraints on development. Preparation of studies to enable the Client to decide whether to proceed and to select the probable procurement method.</i></p>
2	March - July 2010	Procurement strategy established.	<ul style="list-style-type: none"> <li>Strategic Brief</li> </ul> <p><i>Preparation of general outline of requirements and planning of future action on behalf of, the client with client confirming key requirements and constraints.</i></p> <ul style="list-style-type: none"> <li>Outline Proposals</li> </ul> <p><i>Determine the general approach to the layout, design and construction in order to obtain authoritative approval of the client on the outline proposals.</i></p> <ul style="list-style-type: none"> <li>Strategic Brief changed early July 2010</li> </ul>
3	August 2010	Client approves outline proposals.	<ul style="list-style-type: none"> <li>Outline Proposals</li> <li>Stage sign-off by Directorate Managers 06.08.2010</li> <li>Room Data Sheets prepared</li> </ul>
4	August 2010	Equipment procurement process established (Supplies).	<ul style="list-style-type: none"> <li>Detailed Design – Stage 2</li> </ul> <p><i>Full design of every part and component of the building by collaboration of all concerned. Complete cost checking of designs. Monitor performance against the vision and KPIs for the project.</i></p> <ul style="list-style-type: none"> <li>Budget costs prepared</li> <li>Joint Risk register established</li> <li>Room Data Sheets prepared</li> </ul>
5	September 2010	Design continues.	<ul style="list-style-type: none"> <li>Detailed Design ongoing</li> <li>Room Data Sheets signed off</li> <li>Capital Cost Plan submitted for approval</li> </ul>
6	October 2010	Design continues.	<ul style="list-style-type: none"> <li>Detailed Design continues</li> <li>Tender documents prepared</li> </ul>

#	Date	Event	Detail
7	December 2010	Tenders invited (construction)	<ul style="list-style-type: none"> <li>• Tender - Stage 3</li> </ul> <p>Tenders obtained and appraised with recommendations made to CIT to allow an appointment to be made.</p> <p>Asbestos Survey and removal</p>
8	January 2011	Contractor Appointed.	<ul style="list-style-type: none"> <li>• Mobilisation of contractor</li> </ul>
9	February 2011 onwards	Construction phase.	<ul style="list-style-type: none"> <li>• Construction – Stage 4</li> </ul> <p>Contractor programmes the work in accordance with the contract and commences work on site. The client or their representative - the architect in traditional procurement - administers the building contract up to and including practical completion (this is the point at which the contractor hands back ownership of the site and completed project to the client). Further information supplied to the contractor as and when reasonably required.</p> <ul style="list-style-type: none"> <li>• Group 1 Equipment installed</li> <li>• Medical Equipment orders placed</li> </ul>
10	March 2011	CIT reviews costs of new unit.	<ul style="list-style-type: none"> <li>• Revenue plan confirmed by all parties</li> </ul>
10	November 2011	Commissioning and handover.	<ul style="list-style-type: none"> <li>• Commissioning – Stage 5</li> <li>• System Testing</li> <li>• Group 2 &amp; 3 equipment in place</li> <li>• User Training and Induction</li> <li>• Trust final clean and inspection</li> </ul>
11	12 December 2011	Unit operational.	<ul style="list-style-type: none"> <li>• Commissioning completed</li> <li>• Unit opens</li> </ul>
12	Approx April 2012	Follow-up Evaluation.	<ul style="list-style-type: none"> <li>• Post Project Evaluation – Stage 6</li> </ul>
13	October 2012	Exit of Contractor.	<ul style="list-style-type: none"> <li>• Contractor's defect liability ends</li> </ul>

## Appendix D – Optional Additional Investment: MetaVision

### D.1. INTRODUCTION

- D.1.1. There is currently an issue because the general critical care service throughout the Trust is fully equipped with the MetaVision clinical information system (CIS) for data collection and patient care, whereas this system is not currently used by the Neurosciences Directorate.
- D.1.2. This will create an undesirable disparity when the proposed new Central Campus Critical Care Unit is created.
- D.1.3. Therefore the purpose of this Appendix is to seek funding for the procurement of MetaVision for the Neuro component of the proposed new unit, so that it is consistent with the existing general critical care areas. This entails funding MetaVision for 23 additional beds (because the 6 beds used by General Critical Care already have this equipment).

### D.2. CASE OF NEED

- D.2.1. For over the past decade, general critical care at RHH has been using the MetaVision CIS as an integral part of its care and management of patients. The system collects and collates vital signs and other clinical data in real time from monitors, ventilators, blood gas machines, laboratory results, etc. It also records medical interventions and collects activity data for audit and financial purposes.
- D.2.2. In 2007 its use was extended to the new Critical Care Unit at NGH. More recently, its contribution to the work of the service has been extended to include electronic patient notes and drug administration. For all these reasons, it has become an indispensable tool for critical care delivery within the Trust.
- D.2.3. The present difficulty is that the Neurosciences Directorate does not use MetaVision, which means that its beds in the proposed new unit would not be equipped to the same standard. Neurocritical patients have manual records. Observations are charted at intervals by their nursing staff, or transcribed from reporting systems. Cumulative data, such as volume of infused fluid over time, is calculated and charted at the same time. Critically ill patients often have a large number of data fields that require capturing. This practice is time consuming for staff, introduces risk of transcribing and calculation errors, only captures data intermittently, and delays the relay of integrated information to clinicians with consequent delays in decision making. Additional data currently manually collected includes the Critical Care Minimum Data Set, which describes levels of care for audit purposes, and is downloaded at intervals into an MS-Access database. Potential for this method of data collection to accurately code and secure income for the unit has been considered; it has proved time consuming, is generally retrospective and therefore prone to error, and very difficult to validate. Experience from this data collection has discouraged development of other important audit workstreams that are routine in General Critical Care. 'Saving Patients Lives' is an example of one such workstream, which audits the implementation of 'Care Bundles', known to reduce serious infections related to venous access devices and mechanical ventilation. Although these care bundles have been introduced into Neurocritical Care it has proved impossible to audit their implementation or impact. This seriously affects future practice development in this environment.

- D.2.4. There are a number of ways in which this inconsistency could be rectified, and these are considered next.

## D.3. OPTION APPRAISAL

### D.3.1. Option 1 – Continue with Existing Approach (ie Do Nothing)

This is the baseline against which the other options are compared. It does nothing to address the long standing aspiration of Neurosciences to acquire MetaVision for all the reasons described in Section D.2 above. Without MetaVision, there will be no seamless transfer of patient records within the unit, income will be at risk, and audit will be poor. Further, it makes no sense to build a new critical care unit without at least installing the additional MetaVision cabling needed in order to avoid future disruption. The interruption to service provision that such cabling installation would cause is why Neurosciences has previously failed to acquire MetaVision. Doing Nothing means perpetuating a situation whereby there is inequity in standards of critical care, and whereby one of the largest Neurosciences units in the UK does not have a clinical information system. Neurosciences will undoubtedly continue seeking to acquire MetaVision going forward. Hence it is short-sighted not to make provision for it now.

### D.3.2. Option 2 – Network installation only, with increased level of manual effort

This option entails installing the additional cabling, network points and ceiling runs needed to support MetaVision, but without acquiring the system itself. Instead, Neurosciences would deploy increased manual effort until such time as a comprehensive MetaVision implementation was affordable.

However, full realisation of the benefits (described below) which could potentially be achieved from a unified and consistent critical care unit **would not be realised**.

It is not feasible for Neuro to generate the additional data manually. For example, the Trust currently provides 192 data items to the North Trent Critical Care Network and the Intensive Care National Audit Research Centre (ICNARC). In the general critical care areas, this information is fully obtainable from the MetaVision CIS. Where paper records are used, only 25% of the data required is collected. Hence it would require increased resourcing of clinical, admin and clerical staff to record the additional data needed. This would be totally impractical. Current data collection for audit within Neuro Critical Care is not resourced, and time diverted from clinical management has a detrimental, but unmeasured, effect on service.

### D.3.3. Option 3 – Extend MetaVision to the Neuro Level 3 Beds

In this option the management of continuous integrated multiple data fields, and their storage, for Level 3 patients would be facilitated and some benefits realised. To ensure flexible use of the planned beds, this would extend to 10 fully licensed bedspaces potentially occupied by Level 3 patients (as explained in Note 3 to the Costs below).

But this option would not be tenable. Although Level 2 neuro patients generally require far less monitoring, there are frequent exceptions with patients stepping up and down from Level 3 care, as their conditions worsen or improve. With Metavision the data transfer and ongoing electronic records would remain seamless. If this option were employed, the process of stepping up or down - and the movement of beds to respond to clinical demand - would be severely hindered by a need to discharge or admit to electronic recording. Nursing and medical staff working flexibly across the levels would be frustrated by the differences in data collection and access to integrated information. Medical staff

(predominantly Neurosurgeons) working mainly in the Level 2 environment would be disadvantaged when reviewing Level 3 patients as they would be less familiar with the system, with consequent implications for governance. A standardised policy for discharge from Level 2 and 3 care would be frustrated.

#### D.3.4. Option 4 – Extend MetaVision to all Neuro Beds

This is the preferred solution of neuro and general critical care staff and clinicians: To extend the use of MetaVision to every bed in the proposed new unit (ie the total maximum number of beds which might ever be activated, so that the same infrastructure is available for all beds from Day 1, thus reducing the cost). This means extending MetaVision to 23 neuro beds which are not currently equipped with it. The benefits are explained below.

### D.4. BENEFITS

D.4.1. These are (*with more detail provided in italics*):

#### Clinical

- Increase in clinical time for direct care  
*Data fields currently collected in Neuro Critical Care as described above, are time consuming to chart, subject to error, intermittent rather than continuous, and difficult to integrate in a timely manner. MetaVision would release nursing time to direct patient care, and positively influence clinical decision making. Use of the system in other units including our own experience demonstrates this. Benefit to patient outcome, and length of stay are difficult to study, but could reasonably be expected.*
- Access to results  
*Timely access to laboratory results would be facilitated by Metavision, with results automatically transferred from reporting servers, and a record that they have been validated (and therefore seen and acted upon), by medical staff ensured.*
- Paperless system  
*The introduction of IPPR to the Neuro Critical Care environment has presented an increased clinical risk to patient management. These are complex patients, visited by multidisciplinary practitioners frequently throughout the day. Contemporaneous note keeping as per IPPR has made case notes bulky, difficult for intensivists and visiting practitioners to review, with attendant governance risk. MetaVision collates data contemporaneously but allows practitioners to rapidly review case note entries and plans specifically for their subspecialty. The system has been refined by practitioners in General Intensive Care at STH to this end, and is currently one of the most advanced installations available in this respect. This groundwork will allow the full benefits of a paperless system to be rapidly realised within Neuro Critical Care.*
- Improve handover practices and documentation.  
*Handover between practitioners is currently at the bedside, with a paper based prompt and record. Metavision would enable systematic handover, ensuring practitioners have accessed relevant clinical information and securing an electronic signature. This could be away from the bedside, allowing a multidisciplinary approach to ward rounds and handovers that is currently impossible with a paper based record. This has clear advantages to patient care, allowing it to continue during such rounds, and limiting the disruption and infection control issues related to such rounds. Electronic record review of Neuroscience admissions to the Northern Campus (e.g. head injury in a polytrauma patient) would facilitate clinical decision making.*
- Improve patient safety – i.e. legible medical notes, avoids paper transcription errors  
*Entries are electronically time and user stamped, facilitating retrospective review.*
- Secure information

- Legal record  
*Electronically secured, with a printed summary in the case history, agreeing with the principles of IPPR without compromising the subsequent use of the case notes.*
- Reduces drug incidents  
*This has been demonstrated within the Trust and elsewhere, and is integral to the proposals described in the Pharmacy option appraisal below.*
- Provides clinical trends  
*These can be automatically programmed to trigger within set limits, alerting staff to deterioration in condition, and facilitating the activation of treatment protocols (Alarmed/rapid identification of charges in patient allows prompt treatment, adherence to guidelines and protocol)*
- Reduces omissions in records.  
*Electronic prompts ensure complete record keeping, observation and results validation, and prevent omissions in audit data collection which can otherwise be easily overlooked.*

### Audit

- Immediate access to information
- Archived
- Audit and research data available  
*As described above, important ongoing audit, which has proved impossible to conduct with current resources, is actually facilitated by MetaVision. This has been demonstrated within General Critical Care.*
- Validation and examination of data

### Management

- Accurate data for securing income
- Drug reconciliation for payment
- Collates all nutritional input to patient
- Management information electronic and accessible to centre
- Discharge summaries to GPs
- Accurate coding, activity
- Staff appointment and retention  
*Improvement in job satisfaction secondary to the release of time for clinical care is well recognised following the introduction of a CIS, at STH and elsewhere.*
- ICNARC data collection  
*A national quality indicator for morbidity and mortality and publishes STHFT position in quality care outcomes against all other units. Neurosciences is currently unable to collate this data.*

## D.5. COSTS

- D.5.1. This Section details the costs of the additional infrastructure, hardware, software and staff support required to extend MetaVision to the Neuro beds in the proposed new unit.

### Neuro Critical Care – 23 beds

Item	Capital Costs	Non-Recurrent Revenue Costs	Incremental Recurrent Revenue Costs	Comments
Infrastructure	Nil	Nil	Nil	See Note 1
Hardware	£53,637	Nil	£5,045	See Note 2
Software	£135,000	Nil	£14,820	See Note 3



Item	Capital Costs	Non-Recurrent Revenue Costs	Incremental Recurrent Revenue Costs	Comments
Staffing	Nil	£66,637	£69,041	See Note 4
VAT @ 20%	£37,727	Nil	£3,973	See Note 5
<b>Sub-Total</b>	<b>£226,364</b>	<b>£66,637</b>	<b>£92,879</b>	
Capital Charges	N/A	N/A	£52,403	See Note 6
<b>TOTAL</b>	<b>£226,364</b>	<b>£66,637</b>	<b>£145,282</b>	

**Notes:**

1. Assumes that all networking cabling to the Comms Room on K Floor has already been covered in the Estates costs for the core scheme (as customary).
2. Capital costs cover purchase of 23 PCs which will support MetaVision, plus their associated PC monitors, keyboards, mice, mobile carts, and one MetaVision A3 printer. Assumes that the switches in the Comms Room and their revenue costs are already covered by the IT costs for the scheme. Revenue costs cover the annual charges for IT network services. Estimate provided by Carol Hudson.
3. Capital costs cover the Windows XP operating system, Microsoft Office, 4 Full MetaVision licenses @ £9,750 each (because the other 6 will be released from General Critical Care, A Floor), and 13 Lite MetaVision licenses @ £6,500 each. The total sum reflects the extra cost incurred due to the loss of the Microsoft Enterprise Wide Agreement (EWA). Revenue costs refer solely to the MetaVision software maintenance agreement (which is 12% of the capital cost of the MetaVision licenses). Estimate provided by Martin Plura. As regards MetaVision licenses, the costings are based on the following scaling:
  - **Neuro ICU (8 beds).** ICU will have 8 full MetaVision licenses, 6 of which are released by the closure of SHDU, thus only requiring 2 to be bought.
  - **Neuro HDU (15 beds).** HDU will have 2 full MetaVision licenses and 13 MetaVision Lite licenses, all of which will need to be bought. This mix of licenses will provide clinical resilience and allow the proposed new unit to increase its Level 3 capability by transferring these 2 full licenses from HDU beds to ICU beds, if necessary. This represents good VFM because it will allow the unit to expand when (for example) major incidents occur.
4. Non-recurrent revenue staffing costs relate to the backfilling needed for the Trust's implementation team who will be configuring the system and providing initial user training. There are no supplier charges for user training courses, because all implementation services (300 hours on site) are included in the license fees. Any extra days needed are charged at £500 per day plus VAT. Recurrent revenue staffing costs relate to the following costs which will be incurred by neuro critical care: (1) recharge raised by general critical care for system admin support in terms of hardware, drivers, and MetaVision upgrades (£14.5k), (2) recharge raised by general critical care for medical management support in terms of MetaVision customisation and enhancements (£6.3k), (3) recharge raised by general critical care for validation of the neuro component of the overall MetaVision system (£6k), (4) one WTE Audit Clerk (new post mid point 3 @ £20.5k) required to generate the additional audit data needed across the extra beds, and (5) backfilling of 0.6 WTE Neuro nurse needed to act as Superuser and provide ongoing user advice and training, password management, and local configuration (£21.7k). All values include on-costs. Estimate provided by Martin Plura.

5. There will undoubtedly be some scope for VAT recovery, but this should be regarded as a bonus. In any event, it will be claimed by Finance, and not Neurosciences.
6. Estimate provided by Jenny Rutledge. Figure shown is worst case in a full year, although the actual sum would taper off over time. Based on asset life of 5 years.

D.5.2. At present no funding exists for any of these costs, and so the Trust is asked to assume responsibility for them.

## D.6. RISK ANALYSIS

D.6.1. The following risk analysis has been carried out:

#	Risk	Mitigation
1	The software will need to be configured to support the specific needs of Neurosciences. Any delay in releasing key neurosciences staff for this purpose would delay implementation.	All generic information has already been built. The further development would be provided in the main by Critical Care Intensivists and Neuro Anaesthetists. The Trust's relationship with the supplier is excellent. OSCCA would support implementation with its extensive experience and knowledge of MetaVision.
2	The implications of real time data entry are immense. All staff will need extensive user training in order that all areas are covered. Clinicians will need support to ensure users continue to fully utilise the system.	General Critical Care will support the implementation and provide user expertise to train NITU staff. NITU anaesthetists are already familiar with MetaVision due to their experience in other areas of OSCCA.

## D.7. IMPLEMENTATION

D.7.1. The Trust's existing contract with MetaVision allows for the system's expansion without any requirement for initiating an OJEU procurement. This being so, implementation is expected to take no more than about 6 months.

D.7.2. A multi-disciplinary implementation team will be formed, consisting of the following: A Neurosciences Matron (Jane Coates), Neurosciences Service Manager (Carolyn Wilkie), Sheila Reynolds, Martin Axe, Martin Plura, Dr Chris Franks, Dr Richard Bourne and pharmacy staff, plus Neuro Surgeons (Mr Thomas Carroll or nominated representative), Neuro Anaesthetists (Dr Stefan Jankowski or nominated representative), and Physiotherapists.

D.7.3. Implementation of the system will involve significant changes to neuro working practices in order to maximise benefits.

## D.8. CONCLUSION

D.8.1. If this investment is not made in MetaVision, it will damage the Neuro component of the new unit in clinical, financial, audit and research terms. Patient safety and continuity of patient care will be affected. There will be a significant loss of operational flexibility and efficiency, and – importantly – there will be a potentially adverse impact on payment by commissioners.

D.8.2. For all these reasons, the Trust is asked to approve the following additional investment which is currently unfunded:

- Capital Costs: £226,364.
- Non-Recurrent Revenue Costs: £66,637.
- Recurrent Revenue Costs (including capital charges): £145,282.

## Appendix E – Optional Additional Investment: Pharmacy

### E.1. INTRODUCTION

- E.1.1. There is an opportunity offered by the build of the proposed new unit to equip it with a pharmacy environment which will improve patient care, be responsive to staff needs whilst also meeting modern financial requirements. This entails additional staffing and equipment.
- E.1.2. The purpose of this Appendix is to outline how this improvement could be achieved.

### E.2. CASE OF NEED

- E.2.1. Clinical pharmacists improve patient care and outcomes. There are currently national standards for the level and experience of clinical pharmacy services provided to critical care areas. Within the Trust, these are currently met in general critical care, but not in neuro critical care. In recent years there have been a series of increases in Level 3 and Level 2 Neurocritical care bed numbers without parallel increases in clinical pharmacy provision, thereby adversely affecting the service and patient care provided.
- E.2.2. General critical care is based on a hub-and-spoke model for pharmacy services. The pharmacy team is led by Consultant Pharmacist Dr Richard Bourne and covers the general critical care units on A Floor, R Floor, and at NGH. The clinical pharmacy service is provided by the appropriate skillmix of clinical pharmacists and medicines management technicians. The current 6 day service is in line with the OSCCA pharmacy strategy aimed at meeting the national standards, and the service has a plan to move to 7 day working in due course. The strategy addresses the full range of pharmacy activity across OSCCA, and it is being implemented as resources become available.
- E.2.3. In contrast, the majority of Neurosciences pharmacy support is increasingly directed towards neuro medicine. Whilst this benefits neuro medicine (e.g. co-ordination of approximately £2M PbR reclaims for medicines per annum and systems allowing for transfer of unlicensed and named patient drug treatments to neighbouring District General Hospitals), it is at the expense of the neuro critical care service. As a result, the latter is heavily reliant on junior pharmacy staff, pharmacists without critical care training, and/ or pharmacists with insufficient time allocated for patient care and thereby represent a clinical risk to patients and staff.
- E.2.4. This disparity has significant implications for patient care. A service evaluation conducted on neuro critical care (N1) by critical care pharmacists during July 2010 identified approximately 25 medication interventions per day with a potential for significant patient harm (246 in 55 patients in the 10 days). A median of 7 interventions were made per ITU (Level 3) patient and 2 interventions per HDU (Level 2) patient. Of these, 13% had potential for serious patient harm if the intervention had not been made. One third were medication errors highlighting prescribing and administration support requirements. Experience shows that only one third of these errors would be identified by the baseline neuro pharmacy service and therefore the inadequacies of the current service represent a significant risk to patients and the Trust. Investment in the clinical pharmacy service would reduce associated costs by reducing critical care and hospital Length of Stay (LOS); reduce adverse events; improve effective use of medicines, reduce medicine wastage, reduce staff costs associated with management of delirious patients; and reduce litigation. Consequently, if neuro critical care were brought up to the same standard as general critical

care, it is estimated that the savings related to these interventions would range between £85k and £675k recurrently *per annum*. These improvements in patient care and cost savings cannot be realised at present, due to lack of specialist clinical staff.

- E.2.5. Lastly, appropriate pharmacy staffing are imperative for the success of related developments, such as (1) extending MetaVision to the neuro beds, and (2) maximising benefits from the new pharmacy room on K Floor. This is because pharmacy staff have the necessary expertise in medicines management and a proven track record for optimising medicines related technology such as MetaVision in the Trust.

### **E.3. PROPOSAL**

- E.3.1. This proposal consists of two elements, namely, staffing and equipment. They are complementary, ie neither will succeed without the other.

#### **Staffing**

- E.3.2. The ideal would be to establish a full equitable clinical service 7 days per week which is in step with the general critical care strategy for pharmacy support. However, this would cost £152,090 recurrently, which is recognised as being unrealistic in the present financial climate.

- E.3.3. Instead, this proposal seeks the minimum additional staffing which will deliver a full equitable clinical service 5 days per week. This would incur recurrent revenue costs of £85,600.

#### **Pharmacy Equipment**

- E.3.4. There is also an opportunity to use modern technology to enhance working practices in the new pharmacy room on K Floor. There are a number of ways in which this could be done, but - whatever the exact solution chosen - the specification for such improvements ought to be aimed at delivering the following benefits:

- Improve medicine security.
- Improve patient safety.
- Full auditable trail of all medicines.
- Reduce picking errors.
- Reduce missed doses.
- Reduce part pack wastage.
- Faster first doses.
- Reduce ad-hoc orders.
- Improve staff processes.
- Savings in clinical and management time.
- Track PbR tariff-excluded drugs.
- Alerts on expiring drug stock.

- Track restricted antibiotics.
- E.3.5. The project team is currently investigating different forms of equipment which could meet the above criteria, such as IT tracking systems, barcoding, intelligent cabinets, etc.
- E.3.6. Therefore authorisation is requested to prepare a Scoping Paper which identifies the most effective pharmacy solution.
- E.3.7. At Order Of Magnitude level, the capital costs of the resultant equipment identified by the Scoping Paper are likely to be approx £20,000 (or the equivalent revenue cost, if leased), plus recurrent annual support costs of £1,400.
- E.3.8. Annual capital charges are likely to be between £4,630 for an IT tracking system (which has an asset life of 5 years) and £2,665 for an intelligent cabinet solution (which has an asset life of 10 years). Both figures show the worst case in a full year, although the actual sum would taper off over time. For the sake of simplicity, a mean figure of £3,647pa is assumed.

## **E.4. CONCLUSION**

- E.4.1. Clinical pharmacy improvements are needed in order to provide an equitable service for neuro critical care. These will deliver the national standards, significantly improve patient care & outcomes, and lead to proven financial benefits.
- E.4.2. Therefore the Trust is asked to approve the following additional investment, which is currently unfunded:
- Capital Costs: £20,000 (or the equivalent revenue cost, if leased).
  - Non-Recurrent Revenue Costs: Nil.
  - Recurrent Revenue Costs: £90,647 (comprised of £85,600 for staff, £1,400 for annual equipment support, and £3,647 for capital charges).

## Appendix F – Detailed Neurosciences Incremental Revenue Costs

- F.1.1. This Appendix explains the Neurosciences incremental recurrent staffing & non-pay costs in more detail.
- F.1.2. These costings have been estimated by Andy Lowe and are shown overleaf.

**NEURO INCREMENTAL REVENUE COSTS**

	OPTION 1 26 beds in total 1 Extra NITU		OPTION 2 27 beds in total 1 Extra NITU 1 Extra NHDU		OPTION 3 29 beds in total 1 Extra NITU 3 Extra NHDU	
	WTE	£	WTE	£	WTE	£
<b><u>Total Incremental Requirement for extra Critical Care beds,</u></b>						
Nurse Band 6	3.26	£148,428	4.31	£196,445	6.41	£292,478
Nurse Band 5	1.95	£68,160	3.71	£129,409	7.22	£251,908
Nurse Band 2	1.30	£29,555	2.00	£45,491	3.41	£77,362
WTE Sub-Total	6.51		10.02		17.04	
<b><u>Neuro Share of Increased Shared Costs</u></b>						
Ward Clerk/Receptionist (Band 2)	1.57	£29,830	1.57	£29,830	1.57	£29,830
Housekeeper (Band 1)	1.00	£17,200	1.00	£17,200	1.00	£17,200
Technician (Band 6)	1.00	£41,600	1.00	£41,600	1.00	£41,600
<b><u>Additional Ward Clinical Non Pay Costs</u></b>		£30,737		£61,474		£122,947
<b><u>Pharmacy Staff Costs (minimum service as now)</u></b>		£28,521		£28,521		£28,521
<b><u>Staff Uniforms</u></b>		£659		£794		£1,014
<b><u>Occupational Health</u></b>		£1,000		£1,205		£1,540
<b><u>Laundry</u></b>		£600		£1,200		£2,400
<b><u>Clinical Waste Management</u></b>		£500		£1,000		£2,000
<b><u>Training/Study Leave</u></b>		£1,943		£2,343		£2,993
<b><u>HR</u></b>		£1,000		£2,000		£4,000



<b><u>Financial Management</u></b>	£3,000	£3,000	£3,000
<b><u>TOTALS</u></b>	<u>£402,733</u>	<u>£561,512</u>	<u>£878,793</u>

**Assumptions:**

1. Cost of stereo beds on N1 is covered by N2 staff, so there are no nursing costs of providing these once N1 staff move to K Floor.
2. The 4 general beds remaining on N1 need 4 wte, ie 4 qualified at Band 5. There are no excess costs included for the diseconomies of scale of this separate cohort of beds. It is assumed that beds can be paired up with other beds to avoid any diseconomies of maintaining cover.
3. The increase in bed numbers, and in particular the NITU/NH DU split of the growth, as stated under each option heading.
4. All at 2010/11 pay and prices levels.
5. All costs exclude the impact of MetaVision implementation and of bringing Pharmacy input in neuro critical care up to the same standard as general critical care.
6. Domestic costs relate to the cost of cleaning the new area on K Floor, less the cost released from no longer cleaning the relevant areas on N Floor and R Floor.
7. The additional Housekeeper and Ward Receptionist/Clerk costs only relate to the neuro share of these extra costs.
8. Assumes equal weighting of ward non-pay costs between NITU and NH DU costs.
9. Advice has been received that no additional medical staff or other admin staff are required as a result of this expansion.
10. Since the move of CSSD from OSCCA to COO, CSSD no longer automatically receives TiFF income. This is being challenged. If it is not corrected by the time of the expansion, then costs will need including. This can be adjusted at FBC stage, if required.
11. The additional Financial Management requirement is associated with recharge arrangements, and the need to separate costs between the 2 Directorates.
12. Management costs are not increased, and the assumption is that managers just cover a bigger area of responsibility.
13. The nurse wte figures include the impact of 1.0 wte post reduction for 2010/11 P&E.

## Appendix G – Detailed OSCCA Cost Savings

- G.1.1. This Appendix explains the OSCCA cost savings in more detail.
- G.1.2. These savings have been estimated by Joanna Myers and are shown overleaf.
- G.1.3. They remain the same irrespective of which Option is chosen as the preferred solution.

**GENERAL CRITICAL CARE COST SAVINGS**

	<b><u>OPTION 1</u></b> <b><u>26 beds in total</u></b>		<b><u>OPTION 2</u></b> <b><u>27 beds in total</u></b>		<b><u>OPTION 3</u></b> <b><u>29 beds in total</u></b>	
	<b><u>WTE</u></b>	<b><u>£</u></b>	<b><u>WTE</u></b>	<b><u>£</u></b>	<b><u>WTE</u></b>	<b><u>£</u></b>
<b><u>Total Incremental savings for General Critical Care beds based on an existing establishment (100% occupancy model).</u></b>						
<b><u>Medical Staff savings</u></b>						
Consultant Grade - 6.25 PA's	0.63	£75,000	0.63	£75,000	0.63	£75,000
F2 Doctors on-call savings	5.00	£56,800	5.00	£56,800	5.00	£56,800
<b><u>Nurse Staff savings</u></b>						
Nurse Band 7	0.50	£23,100	0.50	£23,100	0.50	£23,100
Nurse Band 6	1.60	£65,000	1.60	£65,000	1.60	£65,000
Nurse Band 5	4.00	£133,230	4.00	£133,230	4.00	£133,230
Nurse Band 2	5.60	£104,100	5.60	£104,100	5.60	£104,100
<b><u>OSCCA savings from pooled resources on K Floor</u></b>						
Ward Clerk/Receptionist (Band 2)	1.50	£31,000	1.50	£31,000	1.50	£31,000
Housekeeper (Band 1)	1.00	£17,600	1.00	£17,600	1.00	£17,600
<b><u>Non-pay costs</u></b>						
Staff uniforms		£500		£500		£500
Training/Study Leave		£1,600		£1,600		£1,600
<b>TOTALS</b>		<b>£507,930</b>		<b>£507,930</b>		<b>£507,930</b>

**Assumptions:**

1. Establishment based on the 100% occupancy model currently adopted within General Critical Care.
2. All at 2010/11 pay and prices level.
3. Ward-based non-pay costs will remain constant since patient numbers are not expected to reduce.
4. Assumes reduction of one further Level 3 bed in April 2011, although there is still some discussion about the exact timing.
5. Assumes release of 6.25 Consultant PAs and on-call savings of 5 x F2 doctors and on opening of K Floor, due to economies of scale across both sites.

## Appendix H – Detailed Support Costings

### H.1. INTRODUCTION

H.1.1. This Appendix explains the revenue costings in more detail.

H.1.2. In each case, they apply to the entire (ie combined) unit.

### H.2. REDUCED UNIVERSITY COST SHARE

H.2.1. There is a need to take account of the recurrent revenue foregone as a result of taking back Tower Block Rooms K134/136/137 from the University. These costs have been estimated by Jenny Rutledge as follows:

	Gross Internal Area (m <sup>2</sup> )	Cost
University occupation of Rooms K134/136/137	94.23	
Estates costs foregone (incl.gas, electric, maintenance, etc)		£7,641
Hotel Services costs foregone (incl. domestics, portering, security, etc)		£2,046
Telecomms costs foregone		£288
Note: Capital charge has been abated by the donated element.	<b>Total Income currently received from the University of Sheffield</b>	<b>£9,975</b>

### H.3. ESTATES/ENERGY COSTS

H.3.1. These costs (which include gas, electricity, building maintenance, capital charges, etc) have been estimated by Jenny Rutledge as follows:

	Gross Internal Area (m <sup>2</sup> )	Cost
Costs for proposed new unit on K Floor	1,762.42	£200,813
Less costs for existing Ward N1	881.21	-£100,406
Less costs for existing Critical Care on R Floor	704.76	-£80,301
Less costs for SHDU on A Floor	90.00	-£10,255
	<b>Total Increase for moving to K Floor</b>	<b>£9,850</b>

## H.4. ESTATES EQUIPMENT MAINTENANCE COSTS

H.4.1. The proposed new unit will of course make intensive use of advanced medical and other equipment, all of which will require annual maintenance contracts.

H.4.2. The Estates Directorate has estimated the likely cost of these to be as follows:

Item	Quantity	Total Cost
Macerator	3	£300
Water Coolers	3	£1,080
Lanson Tube transport station (or similar)	2	£340
Kitchen fridge	1	£50
Avantec pharmacy dispensing units	5	TBC
Bed Pan Washers	0	£0
Ice Maker	2	£300
Lift	0	£0
BMS points (per 100)	10	£100
CCTV	12	£1,200
Fire Alarm	60	£0
Patient Hoist	33	£3,300
Vacuum Plant	0	£0
Access Control	20	£1,000
Medical Gases	232	£0
Lightning Protection	0	£0
Medical Gas AVSU and outlets	29	£5,800
Cooling Plant	1	£6,000
Tube Transport	2	£160
Automatic Doors	0	£0
Drugs Fridges	4	£200
Nurse Call System (per bed)	29	£1,740
Dishwasher	1	£100
Gas boilers	0	£0
Emergency lighting system	60	£0
Fire doors (extra)	2	£0
HEPA filters (per filter)	10	£500
Ventilation Plant	2	£10,000
POU water filters	0	£0
	<b>TOTAL COST</b>	<b>£32,170</b>

## H.5. CLINICAL ENGINEERING (BME) EQUIPMENT MAINTENANCE COSTS

H.5.1. The proposed new unit will make intensive use of advanced medical and other equipment, all of which require annual maintenance contracts. However, the principle adopted in this OBC has been to consider maintenance costs for only those items of medical equipment which are a completely new requirement, bearing in mind that maintenance contracts are already in place for those existing items of medical equipment which can be transferred to K Floor.

H.5.2. There has been insufficient time to estimate the total cost of these contracts in detail. However, Clinical Engineering (Dave Guymer and Chris Monk) estimates that an indicative cost of £75k would be appropriate. VAT is not applicable. This cost is based on the following items (at minimum) falling within the remit of BME:

- Scoop hoists
- Tilt tables
- Thermometers
- Tympanic thermometers
- Humiders with leads
- GE monitors
- GE monitor trolleys
- Suction Controllers Double High
- Suction Controllers Double Low
- O<sub>2</sub> Double Flowmeters
- Air Flowmeters
- Air Flowmeter + suction
- PACS monitors
- PACS monitor trolleys
- Docking Trolleys for ventilators
- O<sub>2</sub> Cylinders & fittings for bed
- Caridine Hi Flo Whisper Star 2 O<sub>2</sub> Generators.

H.5.3. In this context, there has also been some reference made to the following items, although their status is not confirmed at the time of writing:

- Alaris GP pumps
- Alaris syringe drivers
- Feed pumps.

## **H.6. STOREROOM STAFFING COSTS**

H.6.1. For stock management purposes, there is agreement that the whole floor of K Floor will be managed through the MAT MAN system which is currently the system in place in Neurosciences. This involves a total top-up service from the Trust Supplies department via C Floor.

H.6.2. Storage space for consumables has been identified in the proposed new unit, one area for General ITU and one for Neuro, because the consumable requirements are different. The shelving system has been agreed with Supplies, and Dave Marshall has included this in his capital costings.

H.6.3. Following a discussion between Jacky Rawlins and Darren Carnell on 4 October 2010, the revenue costs will be nil. The workload will be absorbed into current numbers.

## **H.7. IT SERVICES COSTS**

H.7.1. The following Table provides a detailed breakdown of the IT requirements which were subsumed into the Estates capital costings, apart from the exclusion(s) stated in H.7.2 below. Any queries should be addressed to Carol Hudson on Ext 13603 or Anne Smith on Ext 66426.

<u>Network Equipment</u>	<u>Quantity</u>	<u>Cost ex VAT</u>
<b>Network Connections for MetaVision PCs</b>		
Cisco 2960-S network switch	8	£25,000.00
Stack Module	8	£5,300.00
0.5m stack cable	6	£270.00
1m stack cable	2	£175.00
1Gb SX SFP	16	£3,000.00
62.5 Multimode LC-ST duplex 3m grey	16	£70.00
APC UPS SUA3000RMXL12U	1	£1,300.00
Battery pack SUM48RMXLBP2U	1	£570.00
AP9630 SNMP card	1	£180.00
		<b>£35,865.00</b>
<b>Network Connections for non-MetaVision PCs</b>		
Cisco 2960-S network switch	4	£12,200.00
Stack Module	4	£2,700.00
1m stack cable	2	£175.00
0.5m stack cable	2	£100.00
1Gb SX SFP	8	£1,500.00
62.5 Multimode LC-ST duplex 3m grey	8	£35.00
APC UPS SUA3000RMXL12U	1	£1,300.00
Battery pack SUM48RMXLBP2U	1	£570.00
AP9630 SNMP card	1	£180.00
		<b>£18,760.00</b>
<b>Network Equipment for GE equipment</b>		
Cisco 2960-G network switch	3	<b>£9,200.00</b>
		<b>Sub Total Network Equipment £63,825.00</b>
<b>Non-MetaVision PCs / Printers</b>		
Standard PCs	23	£10,700.00
Ghost License	23	£145.00
Software	23	£11,500.00
19" PACs Monitors	12	£6,000.00
OCM printer	1	£420.00
Label Printer with Jet Direct	1	£550.00
PrintersHP Laserjet P2015	4	£750.00
		<b>Sub Total PCs/Printers £30,065.00</b>
		<b>Total IT Equipment Costs – Capital £93,890.00</b>
		<b>Revenue Consequences £18,778.00</b>



H.7.2. For the avoidance of misunderstanding, please note that:

- This Table excludes the cost of providing MetaVision for Neurosciences, which is shown separately in Appendix D.
- However, even if Appendix D is not approved, it is assumed that the Trust will still wish to go ahead and provide the cabling and switches to support MetaVision for Neurosciences anyway, ie as part of the capital cost of the scheme, so that the infrastructure is in place for the future. This will benefit the Trust in both clinical and financial terms by avoiding unnecessary disruption of the critical care unit, should funding for MetaVision should become affordable at a later date.
- As regards the recurrent revenue costs, these amount to £18,778 (see Table above) plus potentially £5,045 (see Appendix D.5, Note 2), thus making a total of £23,823 in incremental annual income for IT Services.

## H.8. DOMESTIC SERVICES COSTS

H.8.1. These have been estimated by Andy Lowe and are shown below.

### Hours required to clean K Floor in total:

Band 1	7.00am	3.00pm	7days	210	£2,239
Band 1	7.00am	1.00pm	7 days	42	£448
Band 1	2.00pm	8.00pm	7 days	42	£448
Band 1	4.30pm	8.30pm	7 days	49	£522
					£3,657

### Less: Hours for reduction on ward N1

Band 1	7.00am	3.00pm	7 days	52.5	£560
					£560

### Less: Hours for space released on R Floor

Band 1	7.00am	3.00pm	7 days	52.5	£560
Band 1	4.30pm	8.00pm	7 days	24.5	£261
					£821

### Less: Hours for space released on SHDU (A Floor)

Band 1			7 days	77	£822
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<b>Total Weekly cost</b>	<u>£1,454</u>
<b>Total Annual cost</b>	<u>£75,811</u>
<b>Total Annual cost (incl relief)</b>	<u>£94,763</u>
<b>Non Pay:</b> At 8.3% of pay costs	£7,865
<b>Grand Total</b>	<b>£102,628</b>

## **H.9. CAPITAL CHARGES**

- H.9.1. These have been estimated by Jenny Rutledge on the basis of a start date of 12 December 2011, and an asset life of 33 years for building works and 10 years for equipment.
- H.9.2. The worst case charge is £628,952 in a full year from FY 2012-13 onwards, but this would taper down over time.
- H.9.3. The part-year figure for FY 2011-12 is £243,065.

## Appendix I – Project Organisational Structure

