

Trust Board Committee Meeting: Wednesday 12th November 2014
TB2014.124

Title	Replacement of John Radcliffe Radiology Level 2 Fluoroscopy Equipment
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Status	A paper for decision
History	<p>Proposal supported by Radiology Directorate – November 2013</p> <p>Proposal supported by Clinical Support Services Divisional Management Executive – October 2014</p> <p>Proposal reviewed by the Business Planning Group – 13/10/14</p> <p>Proposal supported by the Trust Management Executive – 23/10/14</p>

Board Leads	Mr Paul Brennan, Director of Clinical Services			
Key purpose	Strategy	Assurance	Policy	Performance

Summary

1	<p>The purpose of this case is to secure agreement to capital and revenue investment to replace the fluoroscopy equipment in use in room 2313 on the John Radcliffe Hospital site, with a modern multi-purpose flat plate technology fluoroscopy unit in an appropriately sized room, allowing general anaesthetic and endoscopic retrograde cholangiopancreatography (ERCP) to be carried out. This room would treat approximately 2000 patients per annum.</p> <p>This fluoroscopy unit is a fundamental diagnostic tool for acute surgical patients e.g. fistulography, bowel obstruction, and for routine upper and lower gastrointestinal imaging, e.g. barium swallows, proctograms for pelvic floor dysfunction, and the ERCP day cases.</p>
2	<p>The current equipment is 11 years old. Royal College of Radiologist guidelines recommend replacement after 7-10 years use. The age of the equipment is resulting in an unacceptable image quality and scarcity of spare parts. The existing machine is cumbersome and newer models would improve the room ergonomics making it easier and safer for both patients and staff to use.</p>
3	<p>The financial implications of this proposal are capital investment of £1,400k - £432k to purchase a flat plate technology multi-purpose fluoroscopy unit and equipment and £968K for enabling work to allow its installation in a larger room. Funding has been identified within the Capital Programme. Additional capital charges of c. £159k per annum will be incurred from 2015/16. Maintenance costs will increase from £14k to £53k per annum from 2016/17. This will be funded from the John Radcliffe Radiology non-pay budget.</p>

Recommendation

The Trust Board is asked to approve:

- Replacement of the fluoroscopy equipment in room 2313, Level 2 Radiology at the John Radcliffe Hospital, with a flat plate technology multi-purpose fluoroscopy unit
- Capital expenditure of £1,400k (£1,158k in 2014/15 and £242k in 2015/16)
- Annual additional revenue costs of c. £159k per annum for capital charges from 2015/16 and an increase in maintenance costs of £39k per annum from 2016/17.

Replacement of John Radcliffe Radiology Level 2 Fluoroscopy Equipment

Trust Management Executive Reference	TME2014.270
Appendices	Appendix 1 – Radiation Physics and Protection – Equipment Performance Summary Reports (Assessments completed in July 2011, August 2012 and May 2013) Appendix 2 – Financial Analysis
Background papers	Endoscopy Risk Register
Action/decision required from TME	Support for the : <ul style="list-style-type: none"> • Replacement of the fluoroscopy equipment in room 2313, Level 2 Radiology at the JR, with a flat plate technology multi-purpose fluoroscopy unit in a bespoke room. • Capital expenditure of £1,400k (£1,158k in 2014/15 and £242k in 2015/16) • Annual additional revenue costs of c. £159k per annum for capital charges from 2015/16 and an increase in maintenance costs of £39k per annum from 2016/17
Strategic Objectives that the case will help deliver	SO1 - To be a patient-centred organisation, providing high quality, compassionate care with integrity and respect for patients and staff – “delivering compassionate excellence” SO 2 - To be a well-governed organisation with high standards of assurance, responsive to members and stakeholders in transforming services to meet future needs - “a well-governed and adaptable organisation” Meeting the needs of the Patient Safety Strategy, July 2008 Meeting the needs of the ‘Risk Management Strategy,’ August 2012 Meeting the needs of the ‘Quality Strategy,’ September 2013
Proposed date that revenue spend will begin:	April 2016
Proposed date that capital spend will	November 2014

begin:	
Conclusion of Equality Analysis	This is an existing service and so there would be no adverse impact.
Review Date	June 2015
Acronyms and abbreviations used	JRH – John Radcliffe Hospital ERCP – Endoscopic Retrograde Cholangiopancreatography GA - General anaesthetic IR – Interventional Radiology MDA - Medical Devices Agency OCCG – Oxford Clinical Commissioning Group RTT – Referral To Treatment RCR - Royal College of Radiologists TVVN – Thames Valley Vascular Network
Author	Ms Debbie Tolley, JR Radiology Clinical Unit Operations Manager
Lead Finance Manager	Ms Doreen Carter, Senior Finance Business Partner
Lead Estates Manager	Mr Geoff Wakeling, Project Manager

1. Strategic Context and Case for Change

1.1. Overview

- 1.1.1. The fluoroscopy unit in room 2313 is a fundamental diagnostic tool. It is required at the John Radcliffe Hospital (JRH) site to meet the needs of acute surgical and other inpatients that cannot be moved to another site, and to support other services based at the JRH, such as endoscopy. Some of the main diagnostic functions are; fistulography, bowel obstruction, routine upper and lower gastrointestinal (GI) imaging e.g. barium swallows, proctograms for pelvic floor dysfunction, and for the Endoscopy Service endoscopic retrograde cholangiopancreatography (ERCP) day cases. ERCP is only carried out at the JRH. Equipment is transferred from Endoscopy to Fluoroscopy to carry out four lists per week. Of these four lists, two lists are used to accommodate patients who need an anaesthetic to undergo their ERCP.
- 1.1.2. The equipment images between 6-12 patients per day (imaging can take between 20 minutes to 1 hour). Historically the unit has accommodated 1,805 patients per annum (Radiology Information System baseline data for 2013/14). This activity consisted of 550 ERCP patients, 55 emergency patients, 250 inpatients/day-case patients and 950 outpatients. Due to issues with the equipment and size of the unit (described in subsequent paragraphs), it has been necessary to relocate approximately 250 ERCP patients to Interventional Radiology (Oasis) for their procedure.
- 1.1.3. This case is not expected to provide an increased throughput of patients.
- 1.1.4. This case seeks approval for capital and revenue investment to replace the current fluoroscopy equipment with a modern multi-purpose c-arm fluoroscopy unit with flat plate technology, and reconfigure the current room to accommodate both the new equipment and the staff and equipment required to deliver the ERCP service.

1.2. Issues with the Current Fluoroscopy Equipment and Accommodation

- 1.2.1. The life expectancy of fluoroscopy equipment is 7-10 years. The current equipment is 11 years old which has resulted in a number of related issues. These necessitate its replacement.
- 1.2.2. **Image Quality:** The last 3 years Equipment Performance Summary Reports (Appendix 1) show that Medical Physics have recommended that the machine be replaced every year. The image quality is poor (at or below the Medical Devices Agency (MDA) standard of 1995) and at some magnifications unacceptable. There is a significant risk that a misdiagnosis or missed pathology could occur as a result. This could have a detrimental impact on the subsequent clinical management of the patient. For visualisation of oesophageal or biliary stents a static image needs to be acquired and then viewed on PACS whilst the patient is still on the table. This increases the examination time and the radiation dose to the patient.
- 1.2.3. **Equipment Age and Reliability:** The equipment suppliers guarantee to maintain the equipment for 7 years following production. Spare parts are no longer guaranteed to be replaced. The inability to guarantee maintenance and repair of the fluoroscopy equipment creates potential for an irretrievable

breakdown. This would severely affect the delivery of the fluoroscopy service at the JRH and delay diagnosis and subsequent clinical management of the patient's condition. It will also have a detrimental impact on the endoscopy ERCP service that uses fluoroscopy and endoscopy together to diagnose and treat problems of the bile and pancreatic ducts on day case patients.

- 1.2.4. **Suitability of Current Accommodation – size of room 2313:** The current room is considered unsafe by the Endoscopy Service (Endoscopy Risk Register, available as a background paper). The current room size and configuration does not support access to the patient and maintain their safety, particularly when patients are sedated, requiring a general anaesthetic (GA), critically ill or elderly and infirm. This has resulted in the need to move two lists per week to the Interventional Radiology room (Oasis) on Level 1 (as already mentioned).
- 1.2.5. The need to relocate this work has had a number of consequences :
- The Interventional Radiology (IR) service supports the Trust as the hub of the Thames Valley Vascular Network, (TVVN). The service provides 24/7 interventional radiology to TVVN and the Major Trauma Centre. This service is at full capacity and has over the last 6 months breached the 18 weeks referral to treatment target (RTT) for vascular interventional radiological procedures.
 - In 2013-14, 157 excess RTT breaches were attributed to Radiology, (value £7,065 at £45 each).
 - In the first quarter of 2014-15, there have been 21 excess RTT breaches (value £4,200 at £200 each). These are mainly due to a lack of capacity in IR, the 250 GA-ERCP patients compounds this problem. Therefore it is important that the GA-ERCP cases currently carried out in this room are moved back to fluoroscopy room 2313.
- 1.2.6. Replacement of the current equipment with a modern multi-purpose c-arm fluoroscopy unit with flat plate technology, in an appropriately sized and configured room will address the potential risks associated with the current service, namely:
- Improved image quality – removing the risks associated with image quality and the age of the equipment.
 - Allows easy and complete access to the patient to facilitate care and imaging of the elderly, infirm, anaesthetised and critically ill patients and during emergency events.
 - Current difficulties in sourcing replacement parts for the equipment with the potential for significant unplanned down time will be mitigated.

2. Objectives and Benefit Criteria

- 2.1. The Radiology Service has identified the following aims for this service development :
- 2.1.1. Replace current equipment with a multi-purpose, flat plate technology fluoroscopy unit, minimising the risks of unplanned equipment downtime or irretrievable breakdown.
 - 2.1.2. Improve the diagnostic quality of fluoroscopy imaging.
 - 2.1.3. Maintain patient safety, particularly when they are sedated, critically ill or elderly and infirm, by using equipment and a room which allows enough space to safely access the patient, with the full team of staff required.
 - 2.1.4. Provide capacity to ensure local and national access standards are achieved e.g. 4 hour emergency access, 6 week diagnostic target, 24/7 inpatient access, 18 week RTT (for ERCP).

3. Options

- 3.1. The following options are considered :
- 3.1.1. **Option 1** – Do nothing – Continue to use current equipment.
 - 3.1.2. **Option 2** – Relocate work from room 2313 to other facilities in the Trust – This option would eliminate the requirement to replace the equipment and provide a larger room, with work being displaced to:
 - JR-IR suite (Room 11 and Oasis)
 - the Churchill Fluoroscopy Unit
 - Children’s Hospital Fluoroscopy at the JR
 - 3.1.3. Achieving this would require the four ERCP sessions and inpatient fluoroscopy (total 800 patients per year) to move to JR-IR suite (Room 11 and Oasis). Subsequently eight sessions of existing JR-IR day cases would need to be moved to the Churchill IR. Capacity for 384 patients has been identified, which is insufficient to accommodate this group of patients. Some of the patients require vascular support which is not readily available at the Churchill. In addition approximately 950 outpatients would need to be relocated to other fluoroscopy units across the trust, predominantly at the Churchill site. It has not been possible to identify sufficient capacity for this group.
 - 3.1.4. As there is insufficient capacity to accommodate the displaced work, this option is not considered any further.
 - 3.1.5. **Option 3** – Replace the current fluoroscopy equipment with new technology - Scoping showed that the existing room is not large enough for the replacement equipment. Therefore this option is not considered further.
 - 3.1.6. **Option 4** – Install a replacement multi-purpose flat plate technology fluoroscopy unit in a larger room.

4. Option Appraisal using Benefit Criteria

	OPTION 1 Do Nothing	OPTION 4 Replace the fluoroscopy equipment in room 2313 (with an increase in room size)
Replace aged equipment	X	√
Improve safety by better access to the patient on the fluoroscopy table	X	√
Improve diagnostic quality of fluoroscopy images	X	√
Achieve local & national access standards	X	√

- 4.1. Option 1 would have no additional cost. However from 2012-14, £3k has been spent on repairs, outside of the £11k maintenance contract. In 2013-14 157 excess RTT breaches were attributed to radiology (value £7.1k). In the first quarter of 14-15, there have been 21 excess RTT breaches at a value of £4.2k. The existing clinical and operational risks would remain compromising the safety of patients.
- 4.2. Option 4 - This option would cost £1,400k capital in order to replace and carry out the necessary building works required to provide a fluoroscopy service with the latest imaging technology and design ergonomics. Capital charges will increase by c. £159k per annum and maintenance costs will increase from £14k to £53k.

5. Recommended option and how it meets the case for change

- 5.1. Option 4 meets the requirements of the current case for change i.e. to address and mitigate the existing clinical and operational risks associated with the current equipment and replace it with a product that is fit for purpose.

6. Financial Analysis of Preferred Option

6.1. Revenue Costs

- 6.1.1. The replacement of the current equipment is not expected to have an impact on patient numbers.
- 6.1.2. The maintenance costs after the 1 year warranty will increase over current levels by £39k, to £53k per annum as flat plate technology equipment is more expensive to maintain than the current equipment. This cost will not be incurred until April 2016 as there is a 1 year manufacturer's warranty following installation. There will be an additional maintenance charge from clinical engineering for £23k per annum.

6.1.3. There is the potential to reduce expenditure through the avoidance of fines relating to RTT performance in Interventional Radiology due to competing need for space (£4.2k per quarter). However a reduction in fines has not been incorporated into the financial analysis as this cannot always be attributed to one problem in the pathway.

6.2. Capital Costs

6.2.1. Capital investment totalling £1,400k will be required (with an equipment cost of £432k (inclusive of VAT) and enabling works of £968k). Provision has been made within the Capital Programme for this investment.

6.3. Cost of Capital

6.3.1. Based upon £1,400k capital expenditure; depreciation and capital charges will be £11k (part year), £159k (full year) falling to £151k by 2018/19.

6.4. Income

6.4.1. No additional income will be generated as this is an equipment replacement case.

6.5. Contribution

6.5.1. There will be a non-recurrent increase in contribution of £14k in 2015/16 as maintenance costs will not be incurred in the first year after installation.

7. Market Assessment (including commissioner discussions)

7.1. The John Radcliffe Hospital is an acute and emergency care hospital and provides tertiary referral services for patients with upper and lower GI problems. It is required to care for patients with complex clinical conditions. Fluoroscopy is a fundamental diagnostic tool for acute surgical patients, e.g. fistulography, bowel obstruction, and for routine upper and lower GI imaging, e.g. barium swallows, proctograms for pelvic floor dysfunction, and the endoscopy ERCP day cases, therefore it is essential the Trust continues to provide this service at the JR. Replacement of the room will not have an impact on commissioning.

8. Benefits Realisation

8.1. The table below shows the quantifiable benefits of the proposal and the plan for achieving them.

Benefit	Performance Measure	Current Value	Target Value	Target Date
Reduced clinical and operational risks associated with an appropriately designed and located facility	Current risk for patient access during sedation and GA procedures	GA cases can no longer be performed in the room due risk.	All GA cases can be performed in room 2313.	May 2015
Reduce workload in Interventional Radiology room by bringing back GA	Breaches reduced in Interventional room – as ERCP	15 week wait for patients to undergo a procedure in	0 breaches due to ERCP cases in Interventional	May 2015

Benefit	Performance Measure	Current Value	Target Value	Target Date
cases to room 2313.	and GA case load referred to room 2313.	the Interventional Radiology room in last 6 months.	Radiology at JR.	
Improved diagnostic image quality	Comparison of image quality with current multi-purpose flat plate technology fluoroscopy facilities within Radiology Directorate	Current image quality below MDA standard of 1995.	Image quality is up to date and of required standard for carrying out relevant procedures.	May 2015

9. Management of Risks of Implementation of Proposal

9.1. The table below lists the risks that would remain if the proposal is agreed and the plan to manage them.

Risk	Impact (I)	Likelihood (L)	Total (IxL)	Mitigating Action	Residual Risk	Contingency plan to address risk
Completing project to anticipated timescale	3	3	9	Regular project team meetings, with review of progress against plan. Corrective action taken to address slippage.	6	Contingency not really required as continuity is maintained (see below)
Maintaining service continuity	4	4	16	Work will be displaced temporarily to Rm 2315. Once Rm 2313 is replaced work can be relocated. Minimal disruption is anticipated.	2	Non identified
Completing project within allocated budget	2	2	4	Contingency within Estates budget for addressing unforeseen building issues. Estates project management. Preliminary exploration work.	2	None identified

10. Implementation Plan

10.1. Estates Project Lead to co-ordinate meetings and planning process with Siemens Healthcare and service users. Dr Suzie Anthony, Clinical Director for Radiology will be the Project Lead for the service supported by Debbie Tolley, Clinical Unit Operations Manager.

Action	Timeline
Business Case approved by CSS DME	October 2014
Business Case approved by TME	23 rd October 2014
Business Case approved by the Trust Board	12 th November 2014
Pre-installation works start on site	December 2014
Works completed on site	March 2105
Commissioning completed	April 2015
Room brought into operational use	May 2015

10.2. The impact and intended effect of this project will be reviewed and reported on 6 months following completion of the scheme.

11. Conclusion

11.1. The existing aged equipment requires replacement. Option 4 of this proposal would deliver equipment in accommodation that is fit for purpose and as a result will reduce the clinical and operational risks that exist with the current equipment.

12. Recommendations

12.1. The Trust Board is asked to approve option 4. This will result in the replacement of the fluoroscopy equipment in room 2313 with a product that is fit for purpose and mitigates the risks that exist with the current equipment and environment. This will require :

- Capital expenditure of £1,400k
- Annual additional revenue costs of c. £159k per annum for capital charges from 2015/16 and an increase in maintenance costs of £39k per annum from 2016/17.

Paul Brennan, Director of Clinical Services
Professor Fergus Gleeson, Divisional Director, CSS
Dr Suzie Anthony, Clinical Director, Radiology
Debbie Tolley, JR Radiology Clinical Unit Operations Manager

October 2014

DIAGNOSTIC RADIOLOGY - EQUIPMENT PERFORMANCE SURVEY REPORT

REPORT NO: JRXR/13051

REPORT DATE: 23-May-13

HOSPITAL: JR
 DEPARTMENT: Radiology
 SYSTEM NAME & ID: Siemens Sireskop
 GENERATOR: serial no. 04614
 FLUORO X-RAY TUBE: Optitop
 RAD X-RAY TUBE: Optitop
 REASON FOR VISIT: Re-test after reported poor quality images
 DATE OF VISIT: 22/05/2013
 TESTS PERFORMED BY: JL/JKB
 SURVEY DETECTOR(S) USED: Barracuda
 PREVIOUS RELEVANT REPORTS: Aug-12 JRXR/12088
 Nov-12 JRXR/12128
 REPORT SENT TO: Gayle Barton, Carol Pickering, Debbie Tolley

1. Summary of Measurements Performed

Fluoroscopy & Fluorography

Entrance skin doserates
 II/FP Input doserates (automatic control)
 Display monitor setup
 Image noise levels
 Contrast-detail imaging performance
 Limiting resolution
 Uniformity of focus
 Field size and distortion

NT
C1
A
C2
C2
C3
NT
NT

Code as follows: A – Acceptable result, R – Recommendation given below, NT - Not tested/required at this visit

Summary of Comments and Recommendations	Action by
C1: Image intensifier input doserates and doses have been adjusted back to baseline levels.	NA
C2: Contrast sensitivity as measured using Leeds test objects TO10 and N3 remains poor for pulsed fluoroscopy modes, in spite of engineers adjustments in 16 Nov 2012.	NA
C3: Measurements of high contrast resolution have improved as a result of engineers adjustments.	NA

Please return this form within Four weeks of receipt.

3. Conclusions

Image quality on this system is largely unchanged compared to previous measures in August during the 2012 annual quality checks and last November: following the engineers adjustments to return input doses to specification levels whilst trying to improve image quality. **Contrast sensitivity for fluoroscopy remains poor compared to a "modern system in average adjustment"** and as stated in previous reports **the unit should be considered for replacement in line with recommendations in HSE PM77 on ageing equipment.** Given the nature of reported image quality problems prior to the visit, the clinical case-mix for this system should be reviewed so that examination imaging requirements do not exceed the imaging capability of the system. For **large patients** contrast sensitivity **maybe** improved by implementing the dose escalation regime given below.

Dose Escalation Regime for large patients: 8pps to 12.5 pps to continuous fluoroscopy (during which the Cu skin sparing filter is removed), to F3 mode continuous fluoroscopy (which is double the dose of F1).

Corrective Actions Undertaken

Signed _____	Radiation Protection Supervisor
Comments _____	Date _____

Corrective Actions Acknowledged

Signed _____	Radiation Protection Adviser
Comments _____	Date _____

DIAGNOSTIC RADIOLOGY - EQUIPMENT PERFORMANCE SURVEY REPORT

REPORT N JRXR/12088

REPORT DATE: #####

HOSPITAL: JR
 DEPARTMENT: Radiology Level 2
 SYSTEM NAME & ID: Siemens Sireskop
 GENERATOR: serial 04614
 FLUORO X-RAY TUBE:
 RAD X-RAY TUBE: Optitop
 REASON FOR VISIT: Annual Performance Measurements
 DATE OF VISIT: 9.8.12
 TESTS PERFORMED BY: JL/JKB
 SURVEY DETECTOR(S) USED: Barracuda
 PREVIOUS RELEVANT REPORT: JRXR/XR/06911 (Nov 2011)
 REPORT SENT TO: Donna Horwood/ D.Tolley

1. Summary of Measurements Performed

General Radiation Safety

Environment survey
 X-ray beam limitation & alignment
 X-ray tube leakage
 Operation of controls & warning devices
 DAP meter calibration

NT
 A
 A
 A
 A

Tube and Generator

kVp accuracy
 Variation of output with kV, mAs
 Accuracy and repeatability of timer
 Total filtration
 Focal spot size

A
 A
 A
 A
 NT

Automatic Exposure Control Performance

Repeatability
 Consistency between chambers
 Reproducibility - kV
 Reproducibility - Phantom Thickness
 Operation of Guard Timer

A
 A
 C3
 A
 A

Fluoroscopy & Fluorography

Entrance skin doserates
 II/FP Input doserates (automatic control)
 Display monitor setup
 Image noise levels
 Contrast-detail imaging performance
 Limiting resolution
 Uniformity of focus
 Field size and distortion

A
 C1
 A
 C2
 C2
 C2
 NT

Code as follows: A – Acceptable result, R – Recommendation given below, NT - Not tested/required at this visit

Summary of Comments and Recommendations	Action by
C1: Image intensifier input dose-rates have increased compared to previous measurements and for the 30 and 17cm fields, are at the IPEM 91 tolerance limit of 25%.	
C2: As stated last year, under normal operating conditions, image quality on this intensifier system is poorer than for a system in average adjustment. Low contrast sensitivity is poor for pulsed fluoroscopy and high contrast resolution has deteriorated compared to previous measures. It is unlikely that any improvement is possible	
C3: The notice regarding AEC offset usage should still be adhered to.	

Please return this form within Four weeks of receipt.

3. Conclusions

Given the poor level of image quality for this system and the fact that dose-rates are increasing (in line with an ageing intensifier), this system should be considered for replacement. This was proposed in last years report and is in line with HSE PM77 recommendations on ageing equipment. Also, as previously noted F3 fluoroscopy mode gives twice the dose-rate of F1 and F2 and should not be used.

Signed _____
 Comments _____

Radiation Protection Supervisor
 Date

Corrective Actions Acknowledged

Signed _____
 Comments _____

Radiation Protection Adviser
 Date

DIAGNOSTIC RADIOLOGY - EQUIPMENT PERFORMANCE SURVEY REPORT

REPORT NO: JRXR/XR/06911

REPORT DATE: 17/11/11

HOSPITAL: JR
DEPARTMENT: Radiology level 2

SYSTEM NAME & ID: Siemens Sireskop
GENERATOR: serial 04614
FLUORO X-RAY TUBE:
RAD X-RAY TUBE: Optitop

REASON FOR VISIT: Annual Performance Measurements
DATE OF VISIT: 14.7.11
TESTS PERFORMED BY: SM/JKB
SURVEY DETECTOR(S) USED: Unfors
PREVIOUS RELEVANT REPORTS:

REPORT SENT TO: Gayle Barton

1. Summary of Measurements Performed

General Radiation Safety

Environment survey A
X-ray beam limitation & alignment A
X-ray tube leakage A
Operation of controls & warning devices A
DAP meter calibration A

Tube and Generator

kVp accuracy A
Variation of output with kV, mAs A
Accuracy and repeatability of timer A
Total filtration A
Focal spot size A

Automatic Exposure Control Performance

Repeatability A
Consistency between chambers A
Reproducibility - kV A
Reproducibility - Phantom Thickness A
Operation of Guard Timer A

Fluoroscopy & Fluorography

Entrance skin doserates A
II/FP Input doserates (automatic control) A
Display monitor setup A
Image noise levels C1
Contrast-detail imaging performance C1
Limiting resolution C1
Uniformity of focus A
Field size and distortion A

Code as follows: A – Acceptable result, R – Recommendation given below, NT - Not tested/required at this visit

2. Recommendations

Under normal operating conditions, image quality on this intensifier system is poorer than for a system in average adjustment. Low contrast sensitivity is poor for pulsed fluoroscopy and high contrast resolution has deteriorated compared to previous measures. It is unlikely that any improvement is possible. Also, the accuracy of the DAP Meter for the under-couch tube exceeds the tolerance limit of 20%. The engineer should check and adjust at the next visit.

3. Conclusions

Given the poor level of image quality for this system it should be considered for replacement in line with HSE PM77 recommendations on ageing equipment. Also, as previously noted F3 fluoroscopy mode gives twice the dose-rate of F1 and F2 and should not be used.

Signed: _____

If there are any queries please contact:

(Tel. 01865 235331)

	Baseline/budget						Proposal														
	2014/15		2015/16		2016/17		2017/18		2018/19		2014/15		2015/16		2016/17		2017/18		2018/19		
	WTE	WTE	WTE	WTE	WTE	WTE	WTE	WTE	WTE	WTE	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	£000s	
A. Direct revenue costs																					
Staff (specify grade & wte)																					
Consultants																					
Sub total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Junior Medical																					
Sub total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Nursing																					
Sub total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Scientific & Therapeutic																					
Sub total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Other Clinical																					
Sub total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Non Clinical																					
Reception staff band 2																					
Sub total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Total Staff	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Non-Staff (inc VAT)																					
Maintenance Costs											14	14	0	53	53	53					
Equipment consumables																					
Total non staff											14	14	0	53	53	53					
Total Direct Revenue costs	A										14	14	0	53	53	53					
B. Indirect revenue costs																					
Staff (specify grade & wte)																					
Radiological Sciences																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Pharmacy																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Therapies																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Laboratory Medicine																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Theatres/Anaesthetics																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Critical Care																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Others																					
Sub total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Total Staff	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0	0	0	0	0
Non Staff																					
Radiological Sciences																					
Pharmacy																					
Laboratory Medicine																					
Theatres/Anaesthetics																					
Critical Care																					
Equipment servicing																					
Revenue set up costs (e.g. IT, Furniture, fittings etc)																					
Outpatient costs																					
Facilities Costs (e.g. catering, linen)																					
Others																					
Total non staff											0	0	0	0	0	0	0	0	0	0	0
Total Indirect Revenue costs	B										0	0	0	0	0	0	0	0	0	0	0
C. Capital Expenditure																					
Equipment													432								
Refurbishment (including contingency)												726	242								
C. Capital Expenditure	C										0	1,158	242	0	0	0	0	0	0	0	0
D. Capital Charge & Depreciation	D											11	159	159	155	151					
E. Contribution to Corporate Overheads @ 15%	E										2	4	24	32	31	31					
F. TOTAL REVENUE COST	F										16	29	182	244	239	234					

Activity & Income

G. Activity (specify HRGs)	Baseline/ budget	Proposal				
	2014/15	2014/15	2015/16	2016/17	2017/18	2018/19
A & E attendances						
Emergency HRGs						
Subtotal emergency	0	0	0	0	0	0
Elective HRGs						
Subtotal elective	0	0	0	0	0	0
Day Case HRGs						
Subtotal daycase	0	0	0	0	0	0
Outpatient new						
Outpatient follow-up						
Subtotal outpatient	0	0	0	0	0	0
Other						
Other						

H. Income	£000s	£000s	£000s	£000s	£000s	£000s
A & E attendances						
Emergency HRGs						
Elective HRGs						
Day Case HRGs						
Outpatient new						
Outpatient follow-up						
Other						
Other						
Subtotal NHS/PCT	0	0	0	0	0	0
Private Patient						
R&D						
Other non NHS clinical						
Charitable Funds						
Other						
Total Income	0	0	0	0	0	0

Analysis of income by PCT

The following table is to indicate changes to current PCT income flows. If future years will alter significantly from this please make clear reference in your business case narrative.

2014/15						
Source of Income	Activity					Other
	A&E	Emergency	Elective	Day case	OP- New/Fup	
Commissioner						
Sub total NHS/PCT	0	0	0	0	0	0
Private Patient						
R&D						
Other non NHS clinical						
Charitable Funds						
Other						
Total	0	0	0	0	0	0

2013/14						
Source of Income	Income					Other
	A&E	Emergency	Elective	Day case	OP- New/Fup	
	£000s	£000s	£000s	£000s	£000s	£000s
Commissioner						
Sub total NHS/PCT	0	0	0	0	0	0
Private Patient						
R&D						
Other non NHS clinical						
Charitable Funds						
Other						
Total	0	0	0	0	0	0

Business Case:

JR Fluoroscopy Replacement

SUMMARY

	Baseline/ budget		Proposal				Baseline/ budget		Proposal				
	2014/15	2014/15	2015/16	2016/17	2017/18	2018/19	2014/15	2014/15	2015/16	2016/17	2017/18	2018/19	
	WTE	WTE	WTE	WTE	WTE	WTE	£000s	£000s	£000s	£000s	£000s	£000s	
A. Direct revenue costs													
Staff													
Consultants		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Junior Medical		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Nursing		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Scientific & Therapeutic		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Other Clinical		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Non Clinical		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Total Staff		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Non-Staff							14	14	0	53	53	53	53
Subtotal Direct costs	A	0.00	0.00	0.00	0.00	0.00	14	14	0	53	53	53	53
B. Indirect revenue costs													
Staff													
Radiological Sciences		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Pharmacy		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Therapies		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Laboratory Medicine		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Theatres/Anaesthetics		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Critical Care		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Others		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Total Staff		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
Non Staff							0	0	0	0	0	0	0
Subtotal Indirect costs	B	0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0	0
C. Capital Expenditure	C						0	1,158	242	0	0	0	0
D. Capital Charge & Depreciation	D						0	11	159	159	155	151	151
E. Contribution to Corporate Overheads @ 15%	E						2	4	24	32	31	31	31
F. TOTAL REVENUE COST	F						16	29	182	244	239	234	234
H. Income													
Total PCT							0	0	0	0	0	0	0
Private Patient							0	0	0	0	0	0	0
R&D							0	0	0	0	0	0	0
Other non NHS clinical							0	0	0	0	0	0	0
Charitable Funds							0	0	0	0	0	0	0
Other							0	0	0	0	0	0	0
Total Income	H						0	0	0	0	0	0	0
SURPLUS (DEFICIT)							-16	-29	-182	-244	-239	-234	-234

Business Case:

JR Fluoroscopy Replacement

INCREMENTAL SUMMARY

		Baseline/ budget					Proposal						
		2014/15 WTE	2014/15 WTE	2015/16 WTE	2016/17 WTE	2017/18 WTE	2018/19 WTE	2014/15 £000s	2014/15 £000s	2015/16 £000s	2016/17 £000s	2017/18 £000s	2018/19 £000s
A. Direct revenue costs													
Staff													
Consultants			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Junior Medical			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Nursing			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Scientific & Therapeutic			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Other Clinical			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Non Clinical			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Total Staff			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Non-Staff								0	-14	53	0	0	0
Subtotal Direct costs	A		0.00	0.00	0.00	0.00	0.00	0	-14	53	0	0	0
B. Indirect revenue costs													
Staff													
Radiological Sciences			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Pharmacy			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Therapies			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Laboratory Medicine			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Theatres/Anaesthetics			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Critical Care			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Others			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Total Staff			0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
Non Staff								0	0	0	0	0	0
Subtotal Indirect costs	B		0.00	0.00	0.00	0.00	0.00	0	0	0	0	0	0
C. Capital Expenditure	C							1,158	-916	-242	0	0	0
D. Capital Charge & Depreciation	D							11	147	0	-4	-4	-4
E. Contribution to Corporate Overheads @ 15%	E							2	20	8	-1	-1	-1
F. TOTAL REVENUE COST	F							13	153	61	(5)	(5)	(5)
H. Income													
Total PCT								0	0	0	0	0	0
Private Patient								0	0	0	0	0	0
R&D								0	0	0	0	0	0
Other non NHS clinical								0	0	0	0	0	0
Charitable Funds								0	0	0	0	0	0
Other								0	0	0	0	0	0
Total Income	H							0	0	0	0	0	0
SURPLUS (DEFICIT)								-13	-153	-61	5	5	5