

Mammographer's guide to the NCCPM Equipment and Fault Website

NCCPM

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1. INTRODUCTION

The National Coordinating Centre for the Physics of Mammography (NCCPM) has developed a system for entering equipment faults for mammography equipment in the NHS Breast Screening Programme. The system is entirely online and is designed to:

- Enable easy addition of new faults
- Provide a log of equipment within each screening unit
- Allow NCCPM to analyse trends in faults occurring with mammography equipment in order to advise the NHSBSP

It is the responsibility of each centre to ensure that the equipment records, faults, and staff names and contacts are kept up to date.

2. USERS

New users can be added to the database by the administrator(s) for each screening unit. Note it is very important to ensure that the email address for the user is correct as the username and temporary password will automatically be sent to this address.

New users will receive an email containing their login details with which they can access the online fault database at: <https://medphys.royalsurrey.nhs.uk/faults/login/>. If the user does not receive the email within an hour (they should check their spam folder) then please let us know at rsc-tr.nccpm@nhs.net so that we can investigate further.

If a user has forgotten their password they should click the *Forgot your password?* button (Figure 1). The system will generate a random password and automatically email this to the registered email account.

If the user does not receive the email within an hour (they should check their spam folder) then please let NCCPM know at rsc-tr.nccpm@nhs.net so that we can investigate further.

Note that if a user enters the wrong password three times in a row then their user account will be locked. Users will need to contact NCCPM (rsc-tr.nccpm@nhs.net) to unlock an account.

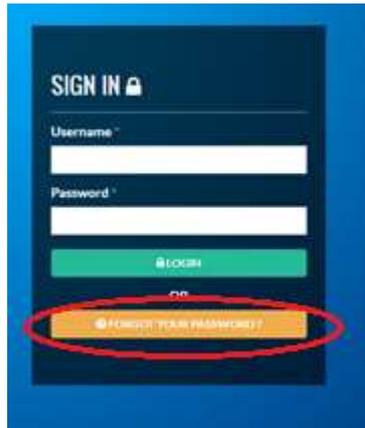


Figure 1: A link is available on the login page for forgotten passwords.

It is the responsibility of the centre administrator(s) for each screening unit to disable user accounts when staff leave and to ensure that new staff are added as required. If the centre admin is leaving or retiring then they should inform NCCPM (rsc-tr.nccpm@nhs.net), ideally with the details of their replacement (even if temporary).

3. FAULT MANAGEMENT

a. Adding a new fault

Adding a new fault to the online database is a straightforward process described below along with screenshots for demonstration. <https://medphys.royalsurrey.nhs.uk/faults/login/>.

Once you have logged in, you will be taken to the home page. First, click on the *Faults* option on the left hand side of the home page.

Once you have clicked on *Faults*, two further options will appear, *All Faults*, and *Add New Fault*. Select *Add New Fault*, as shown in Figure 2.

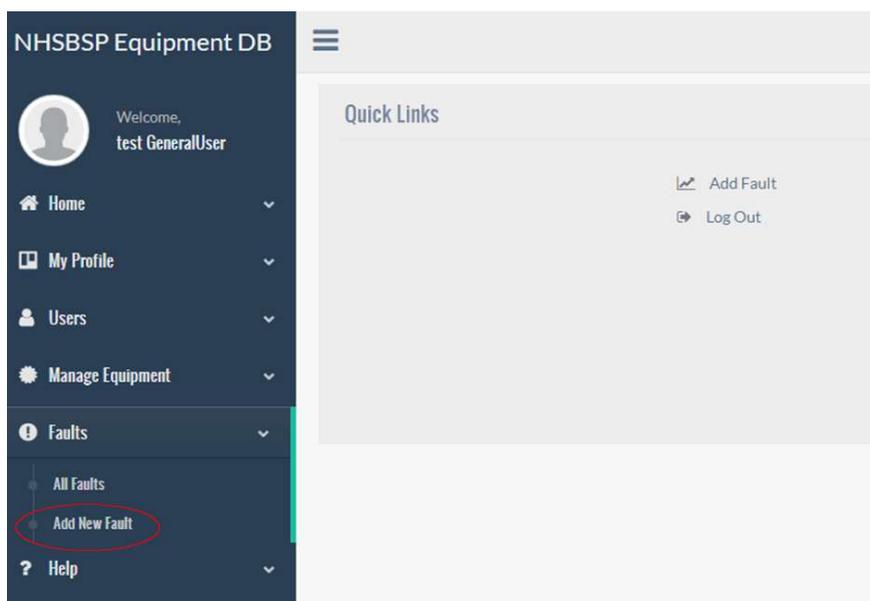


Figure 2: Options under Faults.

The website will now present you with a form to be filled out with details of the fault, as shown in Figure 3. You are required to fill in the centre at which the fault occurred, the type of equipment and the equipment on which the fault occurred. Note that all types of equipment available anywhere in the UK will appear on the equipment type drop down menu, but only equipment available at your site will appear in the equipment drop down menu.

Next, information about the fault is required. You will need to enter information about the type of fault, when it occurred, and a description of what happened. Following this, details of any action which was taken regarding the fault should be entered. Details regarding the severity of the fault and its clinical impact are also required.

The screenshot shows the 'Add New Fault' form in the NHSBSP Equipment DB. The form is organized into several sections:

- Centre with Fault:** Includes dropdowns for 'Centre' and 'Equipment Type', and text inputs for 'Your Full Name' and 'Equipment'. There is also a checkbox for 'Show decommissioned equipment'.
- Fault:** Includes dropdowns for 'Fault Type' and 'Date of Fault', and a text input for 'Current Servicing Agency'. A note states: 'If incorrect this field can be updated in the equipment area.'
- Action:** Includes a text input for 'Service Call No', a large text area for 'Please detail action taken', and dropdowns for 'Fault corrected by user?', 'To fix at next service visit?', and 'Engineer called out?'. There is also a question: 'Has an adverse incident report been sent to MHRA or appropriate devolved administration?' with radio button options for 'Yes' and 'No'.
- Fault Severity:** Includes a dropdown for 'Equipment Status', input fields for 'Total equipment downtime (days)', 'Total screening downtime (days)', 'Number of repeat images', 'Number of cancelled women', and 'Number of technical recalls'. It also includes three satisfaction questions with radio button options: 'Are you satisfied with response of the servicing organisation?', 'Are you satisfied with the performance of the service engineer?', and 'Are you generally satisfied with the reliability/performance of the equipment?'.

At the bottom of the form, there are two buttons: 'SUBMIT FAULT' and 'RESET FORM'.

Figure 3: New fault form.

Once you are happy that you have entered the details correctly, click on *Submit Fault*. Alternatively, to re-start filling in the form from blank, click on *Reset Form*.

b. Viewing, modifying and/or printing a fault

After a fault has been entered, you may wish to view it, modify it or print it out for your own records. From the options on the left hand side of the screen click on *Faults*, then *All Faults*. This will

bring up a list of all the faults for your centre which are currently stored in the online database. These faults can be ordered according to fault type, date etc. In order to see the most recently entered fault at the top of the list, double click on the button highlighted in Figure 4 below. It is also possible to filter the faults using the drop down menus at the top of the page. Centre Admins are also able to export the list of faults to an excel file using the *EXPORT REPORT* button shown in figure 4.

The screenshot shows the NHSBSP Equipment DB interface. On the left is a dark blue sidebar with navigation options: Home, My Profile, Users, Centres, Manage Equipment, and Faults (selected). The main area has a header with 'Welcome, test CentreAdmin' and a user profile icon. Below the header is a 'Region/Centre Filters' section with dropdown menus for Region, Sub-region, and Centre. Further down are filters for Equipment Type, Manufacturer, Equipment, Fault Type, and Approval Status. A table of faults is displayed with columns for ID, Centre, Equipment Type, Equipment, Fault Type, Date of Fault, and Actions. The 'EXPORT REPORT' button is circled in red and labeled 'Only visible for Centre admin'. The table shows three entries for faults at Holby Breast Screening.

ID	Centre	Equipment Type	Equipment	Fault Type	Date of Fault	Actions
58029	Holby Breast Screening	van/trailer	CSC DX-50 12312321 2021 123456 1223456	faulty electrical supply	08/02/21	View Edit
58028	Holby Breast Screening	x-ray set	Instrumentarium Performa 123456 2009 Room 1 Screen Unit	image quality	01/03/21	View Edit
58027	Holby Breast Screening	x-ray set	Instrumentarium Performa 123456 2009 Room 1 Screen Unit	compression fault	14/09/20	View Edit

Figure 4: A list of all the faults for your centre currently on the database which can be filtered to find the fault you are interested in. Note that recent faults or equipment changes that you have made may not be present as they must be approved centrally before going live.

Viewing a fault and/or printing a fault

When you can see the fault you would like to view or print listed on the page, click on the corresponding *View* button on the right hand side of the page (there will be a *View* button for each fault currently displayed as shown in figure 4). The full fault information for the selected fault will be displayed. Click on the *Print fault report* button and a print friendly copy will open. This can be printed using your web browser's print option (usually accessible via the keyboard shortcut Ctrl+p).

Welcome, test CentreAdmin

Home

My Profile

Users

Centres

Manage Equipment

Faults

- All Faults
- Add New Fault

Help

View Fault

PREVIOUS PAGE

Only visible for Centre Admin

PRINT FAULT REPORT

EXPORT FAULT REPORT

Fault Report

Centre Information							
Screening Centre	Holby Breast Screening	Breast Screening Service	Holby Breast Screening	SubRegion	Upper Middle	Centre Code:	HOL
Equipment Information							
Equipment Type	van/trailer	Model	DX-50	Equipment ID No.	10000806801	Manufacturer	CSC
Equipment Name	CSC DX-50 12312321 2021 123456 1223456			Installation Date (Year)	2021	Servicing Agency	MIS
Fault Information							
Type of Fault	faulty electrical supply	Fault ID	58029	Date of Submission	Feb 08, 2021	Fault Description	bang
Fault Action Taken							
Fault Corrected by User?	Yes	To Fix at next service visit	No	Engineer called out	No	Service Call Number	434
Corrective Action Taken	fixed			Adverse Incident Report Sent to MHRA or Appropriate Devolved Administration?	No		
Fault Severity							
Equipment Status:	Equipment temporarily out of use	Total Equipment Downtime (Days):	0	Total Screening Downtime (Days):	0	Number of repeat films:	0
Number of Cancelled Women:	0	Number of Technical Recalls:	0				
Satisfaction							
Are you satisfied With the Response of the Servicing Organisation:	N/A		Are you satisfied with the Performance of the Service Engineer:	N/A			
Are you generally satisfied with the reliability/performance of this equipment?	Yes						
User Details							
Name:	Wilma Rontgen						

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Figure 5: Once you have selected a fault to view, it is possible to print it for your records.

Modifying a fault

It is important that when more information about a fault becomes available (e.g. the extent of the consequences become apparent or the root cause is discovered) the fault is amended to include this information.

Centre Admin users will have the option to edit faults. When they can see the fault they would like to modify or update listed on the page, they should click on the corresponding *Edit* button on the right hand side of the page (there will be an *Edit* button for each fault currently displayed). They can then edit the fault as required to update with additional information or to correct a mistake. They must press the *UPDATE FAULT* button at the bottom of the page once they are finished or the changes will not be saved to the database.

4. ADDING AND MANAGING EQUIPMENT

Centre Admin users are responsible for keeping the equipment associated with their centres on the database up to date and accurate. If you are Centre Admin for your centre, please log in and check that the information about the equipment at your centre is accurate, including models, serial numbers and servicing agents.

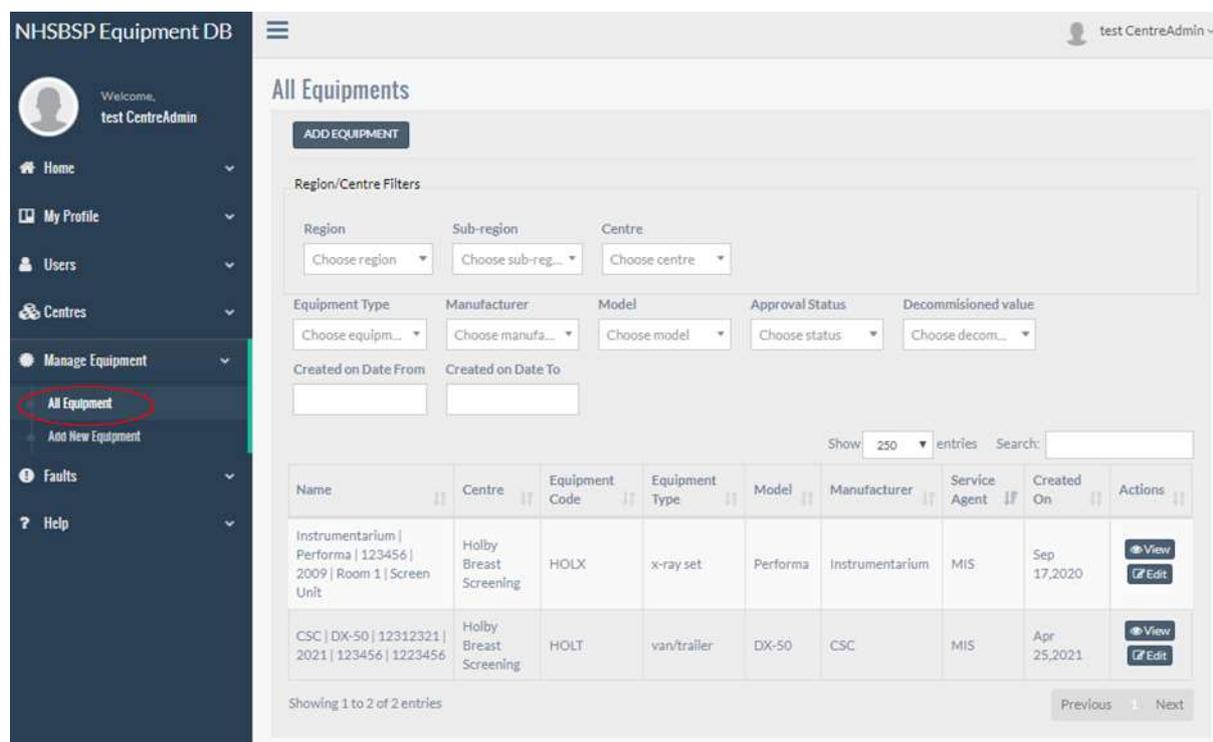
To view the equipment at your centre, click on *Manage Equipment* on the menu on the left hand side of the page, and then click on *All Equipment*. This will show all the equipment at the centres your profile is linked to (figure 6). It is possible to order the equipment by type, model, manufacturer etc. You can then view or edit each piece of equipment using the buttons on the right hand side of the screen. In this way you can make sure that the information is accurate and update if required.

If the equipment is no longer in use, you can select “Yes” on the “Decommissioned” option. Please note that once you have done this, you will no longer be able to add faults to that equipment.

If you need to add new equipment, click on *Manage Equipment, Add New Equipment*. You will then be presented with a form which looks like the one in Figure 7. At the moment, you will only be able to add new equipment where the model type and manufacturer is currently in use elsewhere in the NHSBSP. If you cannot find the combination of equipment type, manufacturer and model that you require, please contact NCCPM (rsc-tr.nccpm@nhs.net or 01483 408310) for further assistance.

Once you have added new equipment, this may be checked by NCCPM before you can add faults and therefore it may take a day or so to appear.

Physics staff can also add on equipment to the database, in those cases the superintendent radiographer will receive email notification.



The screenshot displays the NHSBSP Equipment DB interface. On the left, a dark sidebar contains navigation options: Home, My Profile, Users, Centres, Manage Equipment (with 'All Equipment' circled in red), Add New Equipment, Faults, and Help. The main content area is titled 'All Equipments' and features an 'ADD EQUIPMENT' button. Below this are 'Region/Centre Filters' with dropdowns for Region, Sub-region, and Centre. Further down are filters for Equipment Type, Manufacturer, Model, Approval Status, and Decommissioned value, each with a 'Choose...' dropdown. There are also input fields for 'Created on Date From' and 'Created on Date To'. A search bar and a 'Show 250 entries' indicator are present. The main table lists equipment with columns for Name, Centre, Equipment Code, Equipment Type, Model, Manufacturer, Service Agent, Created On, and Actions. Two entries are visible:

Name	Centre	Equipment Code	Equipment Type	Model	Manufacturer	Service Agent	Created On	Actions
Instrumentarium Performa 123456 2009 Room 1 Screen Unit	Holby Breast Screening	HOLX	x-ray set	Performa	Instrumentarium	MIS	Sep 17, 2020	View Edit
CSC DX-50 12312321 2021 123456 1223456	Holby Breast Screening	HOLT	van/trailer	DX-50	CSC	MIS	Apr 25, 2021	View Edit

At the bottom, it shows 'Showing 1 to 2 of 2 entries' and navigation buttons for 'Previous' and 'Next'.

Figure 6: Navigating to view equipment at your centre.

NHSBSP Equipment DB test CentreAdmin

Welcome, test CentreAdmin

- Home
- My Profile
- Users
- Centres
- Manage Equipment**
 - All Equipment
 - Add New Equipment
- Faults
- Help

Edit Equipment

Centre *

Equipment Type *

Manufacturer *

Model *

Supplier *

Service Agent

Local ID

Location

Serial Number

Year Manufactured Year Installed Year Decommissioned

Comment

Equipment mainly used for *

For x-ray sets only:

Decommissioned Yes No

Spare Yes No

Tomo

Approved Yes No

UPDATE EQUIPMENT

Figure 7: When editing or adding equipment, ensure to fill in as much information as possible.

Some actions on the database are restricted; if you need to remove equipment added in error, add faults to equipment which is now decommissioned, or delete a fault, please contact NCCPM (rsc-tr.nccpm@nhs.net or 01483 408310).

5. HANDY HINTS

The following are some useful tips on filling in the online fault database in order to help us obtain the most accurate information possible:

- Please write in full sentences and give relevant details. For example, if the engineer resolved a problem, please include what the root cause was. The root cause of the problem should be entered as the fault type. For example, if an error code occurred and the engineer had to attend to replace the PC, this should be recorded as Software/PC fault, not error code.
- Please don't enter two or more faults on one fault entry page (e.g. "line artefact and the collimation was out"). These should be entered as separate faults.
- Faults with stereo attachments or biopsy devices should be entered as relating to the attachment, and not to the corresponding X-ray set.
- If a fault relates to the mobile van itself, please don't enter it as relating to the X-ray set, and vice versa. See Fault Types below for more details.
- If the engineer and/or servicing organisation were not contacted in relation to the fault, please leave the check boxes as N/A. However; it is still important to record whether you are satisfied with the reliability and performance of the equipment itself.
- Please do not enter people's names, just use their job role (e.g. the engineer, the superintendent radiographer, etc).

6. FAULT TYPES

The table on pages 11 to 13 contains the different fault types which are available on the online fault reporting system. The different types of equipment which these can be linked to are listed, as well as a description of the fault itself to provide an indication of the circumstances in which it should be used.

7. FEEDBACK

NCCPM are very interested in any feedback you can provide as a user of the online database so that improvements can be made. Please take the time to fill in the feedback form at the end of this document (page 14) and return it to: rsc-tr.nccpm@nhs.net.

Fault type	Relevant equipment	Further details
artefact	Prone table, Ultrasound, X-ray set, specimen cabinet	Marks on image, could be pixels, scratches, image processing or X-ray filter problems.
beam alignment/collimation	Stereo attachment for DR, X-ray set	Beam over- or undercovered image - but does not include light bulb blown (which is LBD fault).
biopsy device fault	Biopsy device, Biopsy device/specimen cabinet, X-ray set	Faulty biopsy device, e.g. Bard Magnum, Achieve disposable (not the stereo assembly).
CESM fault	X-ray set	Fault with Contrast Enhanced Spectral Mammography equipment.
compression fault	X-ray set	Compression problems including footswitch control, force/CBT indication, Siemens OPCOMP system.
cracked/broken paddle	Stereo attachment for DR, X-ray set	As it says (not broken bucky shoulders, which is mechanical/drives, and not broken face guard, which is mechanical/drives).
detector temperature problem	X-ray set	
digital detector failure	X-ray set	This should only be used when the digital detector is actually replaced.
display monitor fault	Reporting workstation, Viewing monitor, Review workstation, X-ray set	A fault with the monitor used to display images/worklists etc.
display/buzzer fault	X-ray set	Faulty display except on monitors. Buzzer sounding when it shouldn't.
early termination	X-ray set	Flash exposure caused by AEC problem
error code	All equipment	Error code displayed, reason unknown. If the root cause of the error is known, that should be entered as the fault type.
faulty electrical supply	Van/trailer, X-ray set	Problems with mains supply to room or van, or with the generator on a van.
faulty QA data	Prone table, Stereo attachment for DR, X-ray set	Unexpected changes in QC data (mammographer QA or physics testing).
fluid leak	Electrical generator, Prone table, Stereo digital, Van/trailer, X-ray set	Includes oil from X-ray tubes and coolant from other parts of system.
grid fault	x-ray set, prone table	Problems with the grid
illuminator fault	Illuminator	All faults on film viewers (not LBDs).

Fault type	Relevant equipment	Further details
Image quality degraded	Biopsy device/specimen cabinet, Prone table, Specimen cabinet, X-ray set,ultrasound	Losses in image quality for various reasons, not obviously anything else (eg processing).
image transfer problem	Biopsy device/specimen cabinet, Data transfer device, Mini-PACS, Prone table, Reporting workstation, Review workstation, Specimen cabinet, X-ray set, ultrasound	
kV error	X-ray set, prone table	
LBD fault	Prone table, X-ray set	Bulb needs replacing/light doesn't come on (not alignment problems).
loss of images	X-ray set, prone table, Mini-PACS	Exposure(s) made and images(s) acquired but not saved on x-ray system
low output	Prone table, X-ray set	
machine electrical fault	Prone table, Reporting workstation, Stereo attachment for DR, Ultrasound, X-ray set, specimen cabinet	Any device not working due to electrical problems (eg overheating, fuse blown, faulty boards).
mechanical/drives	All equipment	Motor drives faulty, also any mechanical/movement problems and broken parts (except paddles).
mini-PACS fault	Mini-PACS	
noisy	Stereo digital, X-ray set, prone table, ultrasound	Unusual noises from X-ray tubes, other devices (excluding buzzers).
non-exposure	Biopsy device/specimen cabinet, Prone table, Specimen cabinet, Stereo digital, X-ray set	X-ray system detects a fault and prevents exposure.
non-functioning	Biopsy device/specimen cabinet, Specimen cabinet, Stereo attachment for DR, X-ray set, prone table, ultrasound	Broad category for device not working, if no other category fits better.
non-termination	Biopsy device/specimen cabinet, Specimen cabinet, X-ray set, prone table	Exposure does not terminate and operator has to stop it.
operator error	All equipment	Where, upon investigation, there is no actual fault with the equipment e.g. user has tried to do something with the gantry in the wrong position. Please only report these if you feel that there is a design flaw or the steps users must follow are not clear.
other	All equipment	As a last resort - if no other category fits

Fault type	Relevant equipment	Further details
overheating	X-ray set, ultrasound	
printer fault	film printer, ultrasound	
reporting workstation fault	Reporting workstation, Review workstation	e.g. Keyboard broken, mouse broken, touch screen broken, finger print sensor broken, barcode reader broken etc.
software/PC problem	Biopsy device/specimen cabinet, Data transfer device, Laptop, Prone table, Reporting workstation, Review workstation, Specimen cabinet, Stereo attachment for DR, Ultrasound, X-ray set	e.g. corrupt database, broken PC, software freezing, computer crashing, errors cleared by soft restart
specimen cabinet fault	Biopsy device/specimen cabinet, Specimen cabinet	All other faults on specimen cabinets
stereo error (not positioning)	Lateral Arm, Prone table, Stereo attachment for DR, X-ray set	All faults on stereo equipment other than positioning errors)
stereo positioning error	Lateral Arm, Prone table, Stereo attachment for DR, X-ray set	All positioning problems (e.g. x-, y-, z- distance problems)
tomosynthesis fault	Tomosynthesis attachment, X-ray set	
trailer fault	Van/trailer	e.g. air-conditioning, doors and locks, roof leaks etc.
tube failure	Biopsy device/specimen cabinet, Specimen cabinet, X-ray set, prone table	X-ray tube fails/needs replacing.
ultrasound fault	Ultrasound	All other faults on ultrasound systems
unwanted exposure	X-ray set	Exposure occurred without exposure button being pressed by operator.
UPS fault	Reporting workstation, Van/trailer, X-ray set, ultrasound	
workstation fault	Reporting workstation, Review workstation, X-ray set	e.g. Display not working, Keyboard broken, mouse broken, touch screen broken, finger print sensor broken, barcode reader broken etc.
wrong exposure	Biopsy device/specimen cabinet, Specimen cabinet, X-ray set	X-ray set exposed with too high or too low mAs (usually AEC fault).

**Radiographer feedback form for the
NCCPM Equipment and Fault Website**

Which centre are you based at?

1. Which internet browser are you using? (select as appropriate)

- Firefox
- Google Chrome
- Internet Explorer (Version)
- Microsoft Edge
- Other

2. Is the NCCPM Equipment and Fault Website easy to use?

- Very easy to use
- Took some getting used to
- Very difficult to use

3. Do you have any suggestions for possible additions or improvements to the system?

4. Do you have any other comments or specific problems to highlight?

Thank you for taking the time to fill out this feedback form, your help is very much appreciated.