Scottish Hospitals Inquiry
Witness Statement of
Darryl James Conner

This statement was produced by the process of sending the witness a questionnaire with an introduction followed by a series of questions and spaces for answers. The introduction, questions and answers are produced within the statement.

Personal Details

1. Name, qualifications, chronological professional history, specialism etc – please provide an up-to-date CV to assist with answering this question.

A Name Darryl James Conner
Specialism Profile; An experienced, MIHEEM and MIET Senior Engineer, that has prior experience as Operational Estates Lead within the Healthcare sector. Excellent leadership and management skills, with extensive experience in managing technical delivery, quality of output and staff development within the Health Built environment. Develops strong stakeholder and team relationships. Enthusiastic and highly motivated with ability to meet new challenges as a consummate professional Engineer.
Specialism Skills matrix Mechanical and Electrical operational maintenance
Critical analysis and review of M&P designs
Lead Authorised Person Experience – Ventilation, MGPS, HV & LV Systems
HAI Scribe, Project Management, Stakeholder Management, Managing teams and organizational skills, Risk assessment, Compliance reviews, SCART Training, Compliance auditing, Presentation Skills, Site Inspection & Reporting, IT Skills Microsoft Office, Authorising Engineer
Understands national standards, Oral and written communication

Education and Qualifications

2022 – Specialised Ventilation in Healthcare Premises, Leeds University

2022 – The Built environment IPC, L11, University of the Highlands & Islands

2020 – MINI MBA, Chester University

2020 – B.Eng. (Hons) Building Services Engineering, Glasgow Caledonian University

2015 – HNC, Electrical Engineering, West College Scotland

2010 – SECTT Approved Electrician ACCA 17th Ed

2002 – SECTT SVQ Level 3 FICCA 16th Ed recognised Electrician Apprenticeship

City & Guilds Qualifications

2023 – (2 day) Authorising Engineer (AUENG)

2022 – (2 day) Ventilation systems verification (HTM 03) (VSV)

2020 – (5 day) 18TH Ed BS7671 CITY & GUILDS.

2016– (4 day) LEVEL 3 AWARD (ME095)
PERIODIC INSPECTION, TESTING & CERTIFICATION OF ELECTRICAL INSTALLATIONS.

Authorised Person Training

2023 – PPL MEDICAL GAS PIPELINE SYSTEMS (AP)2021 – PPL HIGH VOLTAGE SYSTEMS (AP)

2019 – DEVELOP HOSPITAL VENTILATION SYSTEMS (AP)

2018 – DEVELOP LOW VOLTAGE SYSTEMS (AP)

2016 – BOC MEDICAL GAS PIPELINE SYSTEMS (AP)

Professional memberships

Member – IHEEM Registered (Member No. 104716)

Member – IET Registered (Member No. 1100784024)

Employment history

2021 – Present - NHS Scotland Assure – Senior Engineer

2020 – 2021 - NHS GG&C – Site Manager Operational Estates (Electrical)

2018 –2020 - NHS GG&C – (Interim) Site Manager Operational Estates

2018 – 2018 - NHS GG&C – Estates Manager

2014 – 2018 - NHS GG&C – Estates Duty Manager

2012 – 2014 - NHS GG&C – Estates Planning Supervisor

2010 – 2012 - NHS GG&C – Electrical Technician

Professional Background

2. Professional role(s) within the NHS.

A NHS Scotland Assure Senior Engineer Site Manager Operational Estates (Electrical) QEUH NHS GG&C
Interim Site Manager Operational Estates QEUH NHS GG&C
Estates Manager Operational Estates QEUH NHS GG&C
Estates Duty Manager Operational Estates QEUH NHS GG&C
Estates Planning Supervisor Operational Estates WIG NHS GG&C
Electrical Technician Operational Estates WIG NHS GG&C

3. Professional role (s) at QEUH/RHC, including dates when role(s) was occupied.

A 2020 – 2021- NHS GG&C – Site Manager Operational Estates (Electrical)
2018 – 2020- NHS GG&C – Interim Site Manager Operational Estates
2018 – 2018- NHS GG&C – Estates Manager
2014 – 2018- NHS GG&C – Estates Duty Manager

4. Area(s) of the hospital in which you worked/work.

A All my roles where I worked within the QEUH hospital required me to work across areas for all buildings within the QEUH Campus while being based in the Estates office occupied at the time.

5. Role and responsibilities within the above area(s)

A As Site manager for the Estates team at the QEUH, I carried professional responsibility for delivering key objectives, maintaining an efficient, compliant, cost-effective Estates service and was a key member of the Senior Management Team (SMT), I delivered professional and technical leadership, supporting Management, the Head of Estates and Director of Estates and Facilities, assisting strategic planning and implementation of maintenance policies. I managed with the professional application of guidelines and objectives, the Operational Estates financial, human, and physical resources in a professional, cost-effective, and efficient manner using maintenance and specialist contractors and the direct labour force. I was responsible for the management of complex healthcare engineering installations such as medical gas pipeline systems, emergency power generation systems, nurse call systems, theatre plant and equipment and for analysing maintenance options to ensure the continuity of life critical systems. I Optimised and facilitated the delivery of uninterrupted quality estates healthcare service by providing a 24-hour, 7 day a week maintenance service ensuring the safe comfortable & statutory compliant built environment which supports the effective provision of high-quality clinical care for our patients. This was achieved by maintaining and delivering an effective Planned Preventive Maintenance programme and reactive repair service as well as executing installation and commissioning works of critical plant and equipment to support the delivery of all clinical services.

6. Who did you report to? Did the person(s) you reported to change over time? If so, how and when did it change?

A When I was an Estates duty manager I reported to Ian Powrie (Sector Manager), David Bratty (Site Manager) and Colin Purdon (Site Manager) then latterly in this role Ian Powrie, Paul McAllister (Site Manager) and Colin Purdon. When my post changed due to organisational change, I moved off a shift rotation to fulfil a day shift Estates manager post where I reported to Paul McAllister & Colin Purdon while reporting for specific items to Andrew Wilson

(Sector manager) & Ian Powrie (Assistant Head of Estates) As Interim Site manager I reported to Andrew Wilson & Ian Powrie and as Site manager (Electrical) I reported to Euan Smith (Assistant Head of Estates), Alan Gallacher (Head of Compliance) & Mark Riddell (Head of Estates)

7. Who selected you for your role(s)? When were you selected for your role(s)? Please describe the selection process for appointment to this/these roles?

A I was selected for my Role as Estates duty manager in September/October 2014 by job application and a subsequent panel interview that was carried out by Ian Powrie, Alan Gallagher (Sector manager) and an individual from HR (Human resource) The interview consisted of qualification and experience review, technical questioning, current estates health care experience to date review , and a presentation about the challenges in bringing a new Acute hospital online. When I was moved from my shift role to day shift Estates manager role in April 2018, due to organisational change and department restructure of operational estates, it was organised by Andrew Wilson (Sector manager) and facilitated by various conversations with him with respect to timescales, phasing and pay protection. I was selected for my role as interim site manager for operational estates in November 2018 by expressing a note of interest by email for the pending vacancy to both Alan Gallager and Andrew Wilson which progressed to a subsequent panel interview carried out by Alan Gallagher and Andrew Wilson. The interview consisted of qualification and experience review, accomplishments to date, current experience, and discussion around what I can bring to the role in this seconded opportunity. When was I selected for my role as substantive Site manager operational estates role in Jan 2020 the selection process consisted of job application and subsequent panel interview carried out by Mark Riddell (Head of Estates) Euan Smith (Assistant Head of Estates) Colin Purden (Assistant Head of Estates), Tom Fulton (Assistant Head of Estates) and was based on providing a presentation and answering to the best of my ability a series of technical and hypothetical questions from each panel member around the duties required for the role.

8. Had you worked with any of your QEUH/RHC estates and management colleagues before your current role? If so, who had you worked with before this current role? When did you work with this/these colleague(s)? What role were you in when you worked with this/these colleague(s)? How long were you colleagues in this/these previous role(s)?

A I had worked with Mark Riddell at the Western Infirmary General GG&C when I was a technician, and he was a supervisor and latterly when I was a supervisor and he was an estates manger between the years of 2010- 2015 Approximately 5 years prior to becoming an estates duty manager at the QEUH

Specific role(s) at QEUH/ RHC

9. Describe your role(s) at QEUH; job title and responsibilities including day to day responsibilities, and details of staff who reported to you, who you worked alongside and who you reported to. Please fully describe where the role was in the hierarchy of the organisational structure.

A In my role as Estates Duty Manager, I was part of a multi-disciplinary team that included five shift managers who collectively managed 4 shift teams of 5 multi skilled technicians providing 24/7 emergency estates response to all emergency mechanical, electrical and plumbing issues reported within the QEUH Hospital Campus. Each shift manager undertook different AP training and appointments related to their experience and skill set, in my case I undertook Authorised person (AP) appointments for High Voltage systems (HV), Low Voltage systems (LV) and Medical Gas Piped Systems (MGPS). Each shift team under our management comprised of electrical technicians, mechanical fitters & plumbers. My role was to manage the individuals on my team's workload and specific task allocation through CAFM system, and to be the estates point of contact out of hours for all stakeholders that would require assistance, eg clinical and soft FM Teams. It was my responsibility to report on work carried out and ongoing maintenance carried out with working hours

while on duty inclusive of annual leave and sickness management of the individuals on my shift. A key aspect of this role was to regularly navigate the hospitals Building Management Software (BMS) regularly while on duty to monitor the status of key plant and equipment and react to system failures or system in efficiencies either by deployment of my shift team members or by utilising sub-contractor support. An additional aspect to this role was facilitating and supporting planned out of hours Planned preventative maintenance PPM arranged by the day shift estates team, for example annual Theatre maintenance and verifications or subcontracted small works.

In my role as Estates manager Day Shift, I managed the existing maintenance regime in place for the ventilation systems at the QEUH campus inclusive of distribution and review of existing PPM for ventilation plant and the continued roll out of planned annual Theatre verifications utilising agreed verification schedules, liaising with key clinical representatives such as theatre coordinators and Infection prevention and control representatives utilising mechanical NHS technicians, joiners and specialist sub-contractors. As my role developed, I was able to work alongside fellow estates colleague Kerr Clarkston to generate an accurate estate inventory of the QEUH ventilation assets by survey of asset quantity, existing asset document review, system criticality and compliance maintenance priority to assess the existing maintenance and frequencies against Scottish Health Care technical memorandum 03-01(B) SHTM-03-01(B) recommendations to inform and implement changes to the maintenance strategy for greater ventilation compliance within the healthcare estate. This was inclusive but not limited to progression of a verification schedule for isolation rooms, and extending the annual verification program to encompass all recognised critical ventilation systems for annual verification, such as CCU, HDU, MRI etc. During this role I worked with and contributed to estates supervisor workload, while directly managing the workloads of the mechanical dayshift technicians with respect to ventilation PPM and utilised contractor support to carry out my duties. Any escalations or requests for funding or costed remedial works I highlighted to

be carried out were reported directly to the site manager for verbal or written approval. The other aspects of this role were to implement my AP duties for MGPS maintenance undertaking review of contractor risk assessments and method statements and to facilitate the implementation of safe systems of work under permit to work. Additionally, I provided AP support to the site manager to carry out synchronous and black start generator testing alongside supporting my fellow Estate managers in collaborative working to facilitate all ongoing priority in a team approach to provide effective estates resource.

In my role as Interim Site Manager, I was Operational Lead for the Estates team at the QEUH, my duties included delivering key objectives, maintaining an efficient, compliant, cost-effective Estates service. As a key member of the Senior Management Team (SMT), I delivered professional and technical leadership, supporting Management, the Head of Estates and Director of Estates and Facilities, assisting strategic planning and implementation of maintenance policies. I managed professional application of guidelines and objectives, the Operational Estates financial, human, and physical resources in a professional, cost-effective, and efficient manner using maintenance and specialist contractors and the direct labour force. I would consult with the estates managers under my management on complex healthcare engineering installations such as medical gas pipeline systems, emergency power generation systems, nurse call systems, theatre plant and equipment and for analysing maintenance options to ensure the continuity of life critical systems. A key component of my role was to optimise and facilitate the delivery of uninterrupted quality healthcare by providing a 24-hour, 7 day a week while ensuring the safe comfortable & statutory compliant built environment which supports the effective provision of high-quality clinical care for our patients. This was carried out by maintaining and delivering an effective Planned Preventive Maintenance programme and reactive repair service as well as executing installation and commissioning works of critical plant and equipment to support the delivery of all clinical services.

In My role as substantive Site Manager (electrical) my duties and responsibilities were very similar to my interim seconded role however were discipline specific to the QEUH electrical infrastructure and its maintenance with focus on the planned maintenance and management of service contracts that ensured the safe continued operation of the QEUH HV & LV infrastructure. The mechanical and water disciplines were managed by Hugh Brown and Kerr Clarkston as newly appointed site managers with the MEP responsibilities being shared and all reporting to the newly appointed assistant Head of Estates Euan Smith.

10. When did you start your current role? How many people worked within QEUH hard facilities management when you started? How many people worked within QEUH soft facilities management when you started? Did the number of people working at QEUH change during your time there? If so, how many people changed in soft facilities management? If so, how many people changed in hard facilities management?

A I no longer work at the QEUH for NHS GG&C as I left to work with NHS Scotland Assure in July 2021. I started work at the QEUH in December 2014 1 month prior to the hospital being completed under construction. As the Hospital was handed over and the estates service commenced, I believe there was approximately 85 estates operatives however I do not recall how many of them were occupying a management role. Over my 5 years at the QEUH the number of people within estates management fluctuated due to retirement, individuals moving to new jobs and the recruitment process of advertising, interview, selection, and appointment in back filling vacant roles. I had no visibility of the soft facility management aspect of the service and generally would only have an awareness of who was leading that team and if that person had changed

11. How did Estates management operate on a daily basis? Was responsibility shared between different teams? If so, to what extent was responsibility shared?

A Estates management was directed by the site managers, who communicated with the Estates mangers and Estates duty managers who communicated with the supervisors who allocated the work to the technicians. This was not a fixed process, and parallel lines of communication and work streams would normally exist to carry out specific aspects of the maintenance service e.g. an Estates manager may instruct a technician directly when working under a safe system permit to work when carrying out a piece of work for a specific discipline

a) Describe the role of Deputy General Manager of Estates.

A I am not familiar with this job title; I do recall a General manager for Estates role and believe Alan Gallager occupied this role/title for a period of time. It is my understanding this position sat above the Sector manager role for operational Estates where the individual engaged directly with the directorship for estates and was responsible for strategic estates governance and budgetary allocation across the sectors within GG&C.

b) Provide the name and role of any managers you worked with. Please provide their Job (s) and role responsibilities.

A Tom Steel- Director of Estates, Gerry Kox- Assistant director of Estates, Alan Gallagher Head of Estates, Mark Riddell-Sector Manager/Head of Estates, Ian Powrie Sector manager/ assistant head of Estates, Andrew Wilson - Sector Manager, Euan Smith- Assistant Head of Estates, Colin Purdon Site Manager/Sector Manager, David Battey-Site manager, Paul McAllister- Estates Duty Manager/Site Manager, James Guthrie- Estates Duty Manager/Estates Manager, Mel MacMillian- Estates Duty manager/Estates Manager, Thomas Romeo- Estates Duty Manager/Estates Manager, Hugh

McCarten-Estates Duty Manager, Paul Allan- Estates Manager, William Madden- Estates Manager, Kerr Clarkson- Estates Manager/Site Manager.

12. Detail any other roles held by you within the Estates team and provide details as referred to above.

A All my roles held within the estates team are detailed within questions 4-9.

13. How was work delegated in the Estates team?

A All work was delegated within the Estates team through CAFM First, email and verbal communications.

14. How did you keep a record of work delegated?

A Delegated work was normally recorded by email.

15. How did you check that the work delegated had been carried out?

A I would have a conversation with the individual I allocated the work to or received confirmation by email that the work was completed and, in some instances, would physically view the completed work.

16. What concerns, if any, did you have about members of staff? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A Generally, I had no ongoing concerns with members of staff and had a good working relationship with the members of staff that I worked with, if I had any issue with staff availability or work progress status, I would have a conversation with them to understand what support or control measures were required to remediate.

17. What concerns if any did you ever raise about management/ managers? If so, please describe these concerns. What action, if any, did you take in relation to these concerns?

A None that I recall.

18. Describe the interpersonal relationships within the Estates team. How would you describe communication between you and your supervisor(s)/ superior(s)? How would you describe communication to you from those you senior to you/ supervised you?

A Interpersonal relationships at the QEUH were good in my experience, good communication was fundamental in carrying out an operational estates service. I spoke with others the way I would like to be spoken to myself, which would include clear information and description of the task and any safe systems of work or supportive measures required to carry them out. This was also the case when having discussions with my line managers. On occasion instructions came from my line managers with a reactive element accompanied with short time scales and the pressure to carry out tasks as a matter of urgency, however I never felt that further discussion to clarify the task or additional support measures were not available to me should they be required.

19. How many occasions did misunderstandings or poor communication arise within the Estates team?

A In my personal experience these occasions where rare, instructions were generally clear and good working relationships were quickly established which made it relatively easy to discuss any work or themes which mitigated against mis understandings.

Training

20. What training had you undertaken for your role(s) in estates?

A Training was an ongoing part of my roles within GG&C Estates, when I started my role as an estates duty manager at the QUEH I had previously gained 2 years' experience as an estates coordinating supervisor at the Western Infirmary Glasgow and additionally was in my second year of my HNC in electrical engineering and had also completed my Authorised Persons training for Medical Gas Piped systems.

21. What qualifications did you have for your role(s) in estates?

A Please see A1 for qualifications and dates achieved.

22. What experience did you have working in estates prior to the QEUH/RHC? How similar was the industry, role, and responsibilities to your work in QEUH/RHC estates?

A Prior to working at the QEUH/RHC I was an estates coordinating supervisor at the Western Infirmary Glasgow which involved the planning and distribution of estates PPM to a team of multi-disciplinary technicians though a CAFM system which was beneficial in undertaking my new role as Estates Duty Manager but quite different in that the Estates Duty manager role required me to train and assume authorised persons roles for various disciplines including High Voltage systems,/Low Voltage systems, Medical Gas Piped Systems and latterly hospital ventilation systems.

23. Did you have any formal training or qualifications in respect of:

a) Water

A No.

b) Ventilation

A In September 2019 I received training for authorised person Hospital Ventilation systems and on its completion was subsequently interviewed and recommended for appointment for this discipline. The training course I undertook was delivered by PPL Training which was City & Guilds accredited and is intended to provide the necessary information to understand the core duties and responsibilities of the Authorised Person following HTM 03-01 and other associated guidance. The course provided guidance on the legal requirements, design implications, maintenance, and operation of ventilation within healthcare premises. It also covered the inspection and verification requirements as well as the compulsory measurements of performance to ensure ventilation systems achieve the minimum standards and operate to an

acceptable performance level. This training was beneficial and assisted me in applying its principles to the QEUH sizable ventilation asset, to drive compliance with SHTM-03-01 and also under the correct governance the implementation and control of a safe system to work (Permit to work) for critical ventilation assets

c) Infection Control

A No.

If so, please detail above any training and qualifications – when trained? When qualified? Who was the awarding body? Please describe how the training and qualifications applied to your work at QEUH.

24. Have you ever had any specific roles or duties in relation to the water systems operation or maintenance within NHS facilities? When did you have these roles and duties?

A No.

25. If you did:

a) What were these responsibilities?

A N/A

b) What was the purpose of these responsibilities?

A N/A

c) Were you aware of any specific legal responsibilities/ obligations relating to working with the water systems. If so, please detail.

A N/A

26. If you did not have any such roles or responsibilities in relation to the water systems operation or maintenance within NHS facilities:

a) Who did?

A Colin Purdon, Melville MacMillan & Kerr Clarkston

b) What were these responsibilities?

A Please see A26.

c) What did you understand the responsibilities to be?

A My understanding is the responsibilities were to manage and maintain the water system at the QEUH campus. This was done by planned preventative maintenance carried out by the management of subcontractors and Estates staff. The responsibilities also included the management of safe systems of work and regular attendance to the water safety management group and contribution the Water Written Scheme

d) Were you aware of any legal obligations/ responsibilities? If so, please detail.

A The responsibilities where to ensure the water systems at the QEUH campus complied with the guidance outlined within SHTM-04-01.

27. Have you ever worked on a larger scale water or ventilation system before? If so, when was this? How did this compare to working on QEUH? What was your role and duties?

A No, the ventilation and HVAC asset for the QEUH is of considerable size and complexity and requires significant resource in order to maintain in accordance with SHTM-03-01.

28. Do you consider that the QEUH had the 'significant resource' to maintain the water system in accordance with SHTM04-01? To the same extent, do you consider that QEUH had sufficient resource to maintain the ventilation system in accordance with SHTM 03-01?

A I was not involved in the management of the water systems; it was done by others.

For ventilation, I did not have an understanding ventilation at the time even though it is my skillset now, I cannot say unless it is all laid out within the CAMF system, which it was not until Ian Powrie and David Brattey started dealing with these matters. At the time in terms of the maintenance requirement, there was a general level of resource, which increased over time to a full compliment. It is however difficult to put a figure on the level of resource at the time. My duties as an estates duty manager at the time was emergency response out of hours.

Documents, paperwork and processes in place as at 26th January 2015

We know that handover of QEUH occurred on 26th January 2015:

29. What contractual documentation would you expect to see in place at handover?

A At the time of handover, I was not trained or appraised to know what to expect at building handover, so my assumption then was, all as fitted drawings, Schematics, commissioning documentation and operational maintenance manuals for all Hospital MEP and fabric systems followed by training and familiarisation within the hospital on these systems in readiness for maintenance commencement. Based on my knowledge and experience today I would expect to see any handover information agreed contractually and all information and deliverables outlined in accordance with the Building Services

Research and Information Association (BSRIA) A Design Framework For Building Services (BG6) Stage 6 deliverables which is the industry standard that provides clarity of the roles and duties of those involved in the design phases of construction and their responsibilities regarding each building design stage.

30. Describe the process for handover of QEUH:

A I was not involved with the formal handover of the QEUH and was not part of the project team who reviewed commission/validation data, test sheets or provided/accepted system/building sign off. My experience on the lead up to handover was regular familiarisation sessions provided by the builder Brookfield Multiplex to explain to the pending Estates team, system layouts and system functionality.

a) What contractual documentation was in place?

A As per A32 it was not my role to quantify or check this, as an estates duty manager I was given access to the online Zutec portal which had daily updates of system O&M documentation for viewing and familiarisation.

b) How was the relevant paperwork handed over to QEUH?

A I do not know what the agreed process was for this.

31. Was the building of the QEUH complete at handover – if not, what was incomplete? Was QEUH ready at handover? If not, why was it not ready to be handed over? Refer to Estates Communication Bundle, document 3 – ‘Stage 3 Adult and Children's Hospital Completion Certificate’ defects noted therein when considering this question.

A It was not my role as Estates duty manager to know if the QEUH was ready for handover, that was the GG&Cs project team who were responsible for gaining this assurance and sign off. Given my visibility of the number of contractors on site at that time and having reviewed “Estates Communication Bundle, document 3 – ‘Stage 3 Adult and Children's Hospital Completion

Certificate' this would indicate that it was not, I can't comment why the QEUH was not ready for handover as I don't know what was agreed between the project team and the main contractor.

32. Describe the QEUH/RHC site at handover in January 2015.

A I recall this being a very busy time, with lots of contractors on site, regular arrival of new NHS personnel and service providers, various departments and services occupying areas of the building and the estates management team processing and dealing with defects reported by hospital staff and contractors on a daily basis.

33. Did Multiplex remain on site? How was this managed, and were records kept of Multiplex staff being on site, if so who was responsible for this and where were such records kept? Did you have any concerns?

A Yes, Multiplex and their sub-contractors remained on site, each contractor reported to the allocated estates office at the time and signed in and out when they were on site under estates control. These documents were in paper form. I cannot recall if the documents were retained after the defects period had ended however if they were kept, they will exist in the Estates archive at the QEUH Estates department.

34. At handover who was responsible for ensuring that paperwork was produced to confirm contractual compliance?

A I believe this was Greater Glasgow and Clyde's project team.

a) Paperwork

A I believe this was Greater Glasgow and Clyde's project team.

b) O&M Manuals

A I believe this was Greater Glasgow and Clyde's project team.

c) M&E Clarifications Log

A I believe this was Greater Glasgow and Clyde's project team.

d) Others paperwork as per the contract

A I believe this was Greater Glasgow and Clyde's project team.

Provide as much detail as possible – was anything missing? If so, how was this managed?

35. What commissioning and validation documentation for the water system did you see at handover? What commissioning and validation documentation for the ventilation system did you see at handover?

A I did not review commissioning or validation information at handover, this would be the responsibility of GG&C project team and appointed stakeholders.

a) What documentation would you expect to be available for both the water and ventilation systems?

A Please see answer to Q30.

b) Who was responsible for this documentation?

A Generally, contractually the builder/PSCP is responsible for producing this documentation and the project team are responsible for the review and acceptance of it.

c) What was your role?

A My role was Estates Duty manager; I was not responsible for the review of handover documentation.

d) Were you ever aware of commissioning and validation had been carried out?

A Yes in the course of the first year post-handover while working within the estates service and navigating the Zutec portal as and when required for information to assist with estates tasks and PPM the portal did contain

commissioning information for MEP systems, I recall from my 5 years spent at the QEUH there was no original validation documents specific to ventilation systems, any validation type information was subsequently obtained through generated annual verification reports. Validation reports for ventilation systems were sought for new installations or refurbishments by the estates team in the years since building handover.

e) If not, why were you not aware of commissioning and validation having been carried out?

A The awareness and importance of system validation became more apparent to the estates team as our training, and experience progressed in our roles.

36. Was any other paperwork missing at handover? If so, would you consider this missing paperwork to be of importance?

A Yes, as previously advised ventilation validation paperwork was not available from building hand over, I would consider this of importance because without it you have no way to be assured the commissioned design meets the requirement of SHTM-03-01 within the first year of service prior to annual verification.

37. What concerns, if any, did you have regarding there being 'no original validation documents specific to the ventilation system'? At the time, did you expect to see this? What concerns, if any, did you have regarding validation of the ventilation system having been carried out prior to handover?

A At that time I didn't have any concerns, and it would not have been for me to make sure that was the documentation was in place, it would have been capital project team to ensure the documentation was in place, as they were accepting handover. The importance of validation certificates becomes apparent when carrying out tests and from maintenance perspective you have to make sure that it was in place. It becomes a requirement to have the validation when you come to verify the system, as you verify against validation. The assumption was that when moving to hospital following

handover that this had been dealt with by others, but it obviously had not, but I had no reason to expect that it had not been carried out. I was not tasked to look at this at the time, our, as in my team within Estates, responsibilities time was familiarisation, for example, familiarising myself with ZUTEC, where schematics were, and commissioning documents would have been. The lack of validation came to light for me in 2018 when I moved to day shift Estates manager, and between March 2018 to November 2018 when I became interim site manager. Tommy Romeo was my day shift Estates manager predecessor in that regard.

38. Operating systems at handover:

a) How many staff were allocated to maintaining operating systems and how was this determined?

A I recall the entire estates team number of staff was going to be approximately 85 individuals inclusive of manager, supervisors, technicians, maintenance assistants and admin support. I believe this number was requested/ agreed by senior management at that time.

b) What training was put in place for maintaining the operating systems?

A All operatives were invited to attend system familiarisation sessions on the lead up to building hand over, and then at various times within the first year undertook authorised person or competent person training depending on their position, role and discipline within operational estates.

c) Who carried out the training? Refer to Estates Communication Bundle document 5 – 'Brookfield Multiplex Client Training & Familiarisation Register for Ventilation'.

A Brookfield Multiplex and their main MEP subcontractor Mercury Engineering.

d) Were Multiplex involved in the training?

A Yes.

e) Was sufficient training provided to allow staff to operate the systems?

A No familiarisation sessions were provided to estates staff system providing systems overview and location awareness, they were sufficient to allow operatives with existing skill sets and competency to develop their ability to operate the systems.

f) Please describe the manuals/ documents that were handed over.

A This would be for NHS GG&C project team to advise, my early review of the Zutec platform showed system layout drawings, schematics, circuit charts and other engineering information, some items were populated, and some were not, information appeared to still be getting uploaded onto the portal.

39. What was your involvement/ role in the handover process? How did you manage this?

A I did not have any involvement in the handover process, this was carried out by NHS GG&C project team.

40. Who signed the completion certificates?

A I do not know who signed off the completion certificates.

41. Who was the person with the responsibility to sign the completion certificates under the contract?

A I have not seen the contract between GG&C and the Contractor.

42. Estates Communication Bundle, document 3 – ‘Stage 3 Adult and Children's Hospital Completion Certificate’:

a) What is this?

A Having reviewed this document, it looks like a completion certificate outlining areas of completion and listing outstanding defects and an agreed time scales for completion.

b) Have you seen it before?

A No

c) What checks were carried out prior to sign off?

A This would be for NHS GG&C project team at the time to advise.

d) Looking at the defects referred to in the completion certificate documents 3 above: Look also at Estates Communication Bundle, document 4 – 'Capita NEC3 Supervisor's Report (No 46)':

(i) What are these defects?

A These defects are a mixture of MEP and fabric detail.

(ii) What was the impact of these defects?

A In order to assess the impact of these defects the project team would need to have carried out a risk assessment based on the completion time of these defects against the planned occupancy for the building outlining what potential services and clinical aspects may have been affected by the incomplete items detailed within the document.

(iii) Why two years to deal with the defects?

A I don't know, perhaps this was contractually agreed.

(iv) Who decided that it was appropriate to accept handover with outstanding defects?

A I don't know, handover and the acceptance of a building is generally the responsibility of the project team tasked with delivering the project.

(v) Is this usual practice in the construction industry?

A I believe the normal timescale within industry is 1 year however can be different depending on what has been contractually agreed.

43. Refer to Estates Communication Bundle, document 8 – ‘Programme for handover to start of migration’:

a) Do you know what this is?

A This is a handover schedule recording, activity, start and percentage completion/ actual dates.

b) Have you seen it before?

A No.

c) What are the numerous defects?

A There are over 400 items recorded ranging from snagging to equipping to planned phased occupancy.

d) What is your understanding of the purpose of this document?

A My understanding of this document is to provide a rolling record for the project team to control, what is to happen, when it is to happen and how much of the task has been completed.

e) What comments, if any, do you have regarding the number of defects?

A The number of items on this document seem of a significant quantity and are not entirely detailed for a 3rd party to understand exactly what the task is to be carried out.

f) To what extent were you aware of this document at handover?

A None.

g) If not, should you have been aware of this document at handover?

A I don’t believe so, I think the visibility of this document and its status should have been shared between the project team and the head of operational estates to provide context of the status of the project in readiness for occupancy and operational maintenance.

44. What did the contract say about retention of certain parts at handover? Was this enforced and why?

A I had no visibility of the contract in my role as estates duty manager.

45. To what extent did Multiplex retain responsibility for the build following handover? Did Multiplex give any warranties? What were the terms of any warranty relating to Multiplex's work? How long was the warranty period following handover in January 2015?

A I don't know, I believe 2 years was mentioned earlier in the questionnaire and was in keeping with general awareness of the hospital at that time.

46. How many companies have on-going responsibility following handover? If so, describe the responsibilities of the companies. How long post-handover were the other companies involved for?

A I do not know how many companies had on going responsibility following handover.

47. What concerns, if any, did you have about the opening of the hospital after handover? Refer to Estates Communication Bundle, documents 19 and 21 and 21.1 when answering.

A I recall being personally surprised how quickly the project went from what still looked like a building site in late December to a finished facility that was being handed over for use in January. Having reviewed bundle docs 19,21,21.1 I find the reported defects by Ian Powrie in keeping with what the estates team and clinical teams were reporting to him on a daily basis for escalation with Brookfield Multiplex. The volume of wide spread system and fabric defects being regularly reported I found were often highlighted through occupancy and use of the systems and reporting by the users. Where there was areas of work still to be completed, I was of the understanding these items would have been agreed between the GG&C and the contractor, however for systems that were recognised as faulty under use such as e.g PTS system referenced within the bundle or the functionality of heating valves for clinical areas, did

raise the question if correct commissioning of these systems had taken place and why component failure was taking place at such an early stage since handover which was a regular challenge for estates within the early years of ownership.

48. What action, if any, did you take regarding the question fo the correct commissioning of these systems?

A It wasn't my remit; I would not have had visibility of the commissioning information. This is something which would have been reviewed and signed off by others. I was not in a position to question that. I would say that it was quite surprising to me that prior to Christmas building looked second fix, and yet when we came back after the Christmas break the building had a veneer of finish, there must have been a significant work force to get it to that stage in that time.

(a) Was there anything missing that you thought should have been constructed/installed? If so, please describe what was missing.

A This is difficult to say without knowing what was contractually agreed, at a glance areas that were deemed as complete and ready for occupancy looked visually complete and tidy, this was not an indication of the correct functionality of the systems within these areas.

(b) Did you have any other concerns about areas of the hospital at handover?

A I was concerned about the shear size of the building and the little time that most staff were given to familiarise themselves with its demographic and the complex systems within it. It was apparent from quite early on that all required specialist service contracts were not yet in place and would make maintenance, break downs and critical spares a challenge.

49. Refer to Estates Communication Bundle, document 22 at the point of patient migration Mhairi Lloyd states that there were rooms/ areas ‘not yet fit for purpose’: Look also to Estates Communication Bundle, document 19:

a) What was your understanding of the concerns – namely what the concerns were and why?

A Having read this document my understanding is that Infection control individuals have reported that the decon room within A&E is not ready for use due to room cleanliness, incomplete fabric and concerns about the rooms ventilation strategy.

b) To what extent were you involved with the dealing with any concerns?

A Ian Powrie was dealing with these concerns.

50. Detail the snagging process, refer to Estates Communication Bundle, documents 90 and 91 when considering your answer detail:

a) What happened

b) How long were Multiplex on site following handover

c) Main areas for snagging

d) Records of works carried out

e) Sign off – who as responsible and when signed off.

A Snags were recorded by estates management operatives on the FM first system, these issues where then filtered by date and then extracted onto a spreadsheet (with assistance from NHS IT operatives), the spreadsheets where then issued to the builder for review, acceptance and progression to completion. Once advised by the builder that the snags had been addressed, estates supervisors would check were possible the completion of these items and the jobs would then be manually closed of on fm first to record their completion. This process was ongoing throughout the early years from handover where the multiplex and their contractors were still on site, I recall the warranty period came to a end early and all items of a similar nature where then managed by estates as best as possible while a claim was

compiled by senior management to address any long outstanding warranty claims.

51. Refer to Estates Communication Bundle, document 132 with the benefit of hindsight do you agree with Frances Wrath's comments that all area were commissioned in line with Employer's Requirements?

A As Estates Duty manager I had no visibility of the contract ERs or legislative requirements requested with respect to commissioning there for cannot comment.

Wards and Hospital Occupation from January 2015

52. At the point of taking occupation of QEUH/RHC on 26th January 2015 please confirm whether the following wards were fully handed over from Multiplex to NHS GGC:
Ward 2A/2B
Ward 4B
Ward 4C
Ward 6A
Ward 6C

A I don't know, NHS Project team to advise.

53. Please also confirm your understanding of the ward specification and patient cohort to be located in each ward.

A As Estates Duty Manager I had no visibility of the buildings agreed environmental matrix, in my experience working at the QEUH my understanding was that Ward 2A was Children's Haematoncology, 2B was children's Oncology day unit, 4B was Adults BMT,4C was adults Haematoncology, 6A was a general clinical ward later utilised as a decant ward for children's 2A patients & 6C was a general medical ward.

54. If a ward or wards were not handed over on 26th January 2015, or were partially handed over, please confirm:

a) Why they were held back?

A I don't know.

b) Any financial consequence to both Multiplex and NHS GGC of the ward(s) being held back?

A I don't know.

c) What works were carried out in order to allow this ward(s) to be handed over the NHS GGC?

A I don't know.

55. Were any other wards, aside from those referred to above, retained? Answer as above?

A I believe a handover Ward 4B was held back as it was still undergoing construction to facilitate an adult BMT application.

56. We know that the energy centre was retained by Multiplex

a) Why was the energy centre retained?

A I believe there was aspects of the energy centre to still be completed.

b) What financial consequences, if any, arose for either Multiplex or NHS GGC if the energy centre was retained?

A I don't know

c) What works were carried out to allow hand over of the energy centre to NHS GGC?

A I recall post handover installation of boiler safety valve flus, however had no visibility or responsibility regarding the completed schedule of works to facilitate handover, this would be for the project team to advise.

57. Were any other parts of the hospital retained by Multiplex pending works being carried out? Why? What works required to be carried out prior to them being handed over?

A I don't know

58. At the point of handover on 26th January 2015 how satisfied were you that all areas accepted by NHS GGC were designed to the intended specification and suitable for the intended patient cohort, meeting all the relevant guidance requirements?

A At this point in time I had no idea what the intended and agreed design specification was, the handover was managed by NHS GG&C project team.

Asset Tagging

59. Describe and detail asset tagging:

a) What is this?

A Asset tagging is coding and labelling a specific item of plant or equipment.

b) Why is this important?

A It is important as it provides record of equipment detail, date of installation, location and possible maintenance history.

c) Who was responsible?

A I don't know, In my experience this is normally a pre requisite under a contract for the builder to under take and submit as part of the client handover package.

d) What was the impact if this was not done?

A In accurate asset schedules, risk of missed maintenance and servicing.

e) What concerns, if any, did you have about this?

A I was not concerned by this as the plant in my experience was asset tagged and as the PPM system was still in development for integration with our CAFM system FM First, led by Alan Gallager Head of Estates, it was my understanding this exercise would form part of the checks required prior to the system being implemented.

f) Did you escalate these concerns? If not, why not?

A No See A59e

g) Discuss any issues regarding asset tagging and how you managed this?

A No

60. Was there a contractual requirement to provide CAMF?

A I don't know

a) Again, what is the purpose of this and who was responsible for providing this?

A I don't know who was contractually responsible for providing this.

b) What is the purpose of CAMF?

A The purpose of CAMF is to provide an operational maintenance team with the tool to effectively carry out maintenance of building services, whereby all maintenance is planned and generated at the frequencies of guidance of which the asset is benchmarked against.

c) How does ZUTEC differ from CAMF?

A Zutec is a digital platform where as fitted drawings, schematics, commissioning and validation information can be uploaded to for viewing by pre-selected operatives with approved user names and passwords.

d) Should CAMF have been provided at handover?

A In my opinion, yes

e) Should ZUTEC have been provided at handover?

A In my opinion yes

(i) Who was responsible for ensuring provision of CAMF and ZUTEC?

A I believe the original provision of Zutec was Multiplex and CaFM I don't know.

(ii) What were the consequences of these not being provided?

A The reasons outlined in Answer 60b are extremely challenging to achieve with certainty.

(iii) What action was taken to remedy matters? Were Multiplex contacted?

A I don't know

61. Provide information on any issues in relation to CAMF and ZUTEC:

a) Operation

A At the time of handover CAMF was only operational for job creation and user reporting, it was not set up to be used to implement asset Planned Preventative Maintenance (PPM) Zutec was challenging to navigate until familiarisation was gained whilst not all relevant information regarding building services was available as system uploads were on going and continual during the first 2 years post handover.

b) User suitability

A Please see A 61a

c) Any other matters

A Please see A 61a

d) Who was this reported to, what action was taken to remedy matters?

A Any matter where escalated to Ian Powrie for progression

62. Did your team or NHS IT develop a system for asset registration? If so, when and how long did it take following handover.

A I don't know, I was not involved with this.

HEPA filters

63. Were HEPA filters installed in the relevant rooms at handover (January 2015)?

A I don't know what rooms were agreed for installation of HEPA filters at handover.

64. What issues, if any, were there with HEPA filters? Refer to Estates Communication Bundle, document 22.

A I don't Know.

65. If so, what issues were you aware of?

A I don't know.

66. Dr Gibson in her statement refers to HEPA filters not being in place at the point of handover in wards 2A/B.

a) To what extent, if any, do you agree with Dr Gibson's statement above concerning HEPA filters?

A I agree if there is a highlighted clinical requirement either by design or application or recommended by guidance then HEPA filters should be in place to support the agreed ventilation strategy.

b) What was the impact of HEPA filters not being installed?

A Lower level of particulate filtration.

c) What was the potential patient impact of the absence of HEPA filters?

A The potential impact is dependent on the patient cohort served by the system that may include them.

d) What was done to resolve any HEPA filter issues?

A The resolutions are dependant on the perceived filter issues, which can be addressed via installation, challenge testing and subsequent replacement and verification.

e) What filter should have been installed at handover?

A The accepted design specification of filter that should have been stakeholder agreed through design review and cognisance of relevant guidance that's suitable to support the patient group it is intended to serve.

f) Who was responsible for providing HEPA filters and ensuring that they were installed during the build?

A I don't know what the contractual agreement was, see NHS GG&C project team.

67. Were HEPA filters missing from any other wards following handover?

A I don't know what was contractually agreed to be installed during construction, see project team.

<u>Chilled beams</u>

68. Can the witness recall any specific events in relation to chilled beams?

A I can remember on occasion incidents in rare atmospheric conditions when chilled beams had condensation dripping from them that had a global effect on the hospital. I also can remember an incident within 6A where a chilled beam was reported to be leaking, that was found to be a result of pipe contraction due to energy centre boiler failure and the use of flexi fittings to

connect the flow and return of a chilled beam rather than compression fittings which mitigate the risk of leaks against thermal contraction.

For example:

a) Dripping chilled beams in critical care refer to Estates Communication Bundle, document 63.

A I don't recall this particular incident.

b) Issues with dew point controls refer to Estates Communication Bundle, document 65.

A Please see answer to A68a

c) Ward 2A cubicles 8-11 refer to Estates Communication Bundle, document 106.

A I don't know however agree with Ian Powrie's assessment that no chilled beams exist within the isolation rooms and that cooling is achieved centrally at the AHU.

d) Leakage chilled beams Ward 6A refer to Estates Communication Bundle, document 138.

A Please see A 68

e) Leakage chilled beams Ward 6A refer to Estates Communication Bundle, document 139.

A Please see A 68

f) Dr Christine Peters tells us that she inspected the beams in 3 patient rooms in ward 6A and *'found that they were dirty with water dripping through from the corner, Darryl Conner stated that the boiler had been out of action and that this had meant that the hot water supply pipes had contracted causing the leaks to occur at the joints.'*

Explain your understanding of the issue:

A Please see A 68

g) Explain your understanding of the SBAR Dr Christine Peters prepared summarising the issue?

A It is my understanding that Dr Christine Peters is required to carry out a SBAR after attending the incident as a microbiologist in order to record the assessment of the issue and the mitigative and reactive measure that are to be implemented in order to minimise the risk of infection.

h) Leakage chilled beams Ward 6A refer to Estates Communication Bundle, document 142.

A I believe this document refers to the discussion of the SBAR and any additional measures and remedial actions that may be taken to minimise the risk of infection.

69. What involvement, if any, did you have in respect of the SBAR? Including any involvement in remedial actions?

A From my recollection of the incident recorded in this SBAR was following a leaking chilled beam in a patient room, as a patient's foot got wet from the leaking chilled beam. I believe Infection Control colleagues carried out this retrospective SBAR to record and address the issue. There had to be a rapid HAI Scribe to inspect the chilled beams. My remit was to support inspection of the chilled beam and to facilitate the protective measures outlined within the HAI Scribe, supporting physical access to other members of staff, to look at mechanical, electrical and plumbing factors, and what would potentially have caused the leakage. I recall that we had a boiler failure in that time. Due to the nature of the connection to the chilled beams, the flexi hose style doesn't do too well under thermal contraction and expansion, it seemed that when the connection contracted and expanded because of heating flow and return temperature fluctuation due to boiler failure the pipe connections to the chilled beam had leaked. In my view, if condensation was the cause of this ingress then it would not just have been one room that was affected, It seemed to me to be the boiler failure and the drop in temperature had caused the fitting to fail

under thermal contraction. Estates had to ensure adequate inhibitor was in the system post repair as an action. I don't think there was an awareness among IPC at that time that chilled beams are closed circuit sealed systems, this means that the quality of water in pipework is not the same standard as consumable domestic standard at a sink tap or showerhead. The inspection prompted remedial works, which involved retro-fitting the hoses to chilled beams for compression type fittings to mitigate the risk of future leaks.

i) Any other issues/ incidents not mentioned above.

A None that I can recall.

For each event please tell us:

a) What was the issue?

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved?

d) What was the escalation process?

e) Were any external organisations approached to support and advise?

f) If so, what was the advice?

g) Was there opposing advice and by whom, and what was the advice?

h) What remedial action was decided on and who made the decision?

i) Was the issue resolved – consider any ongoing aftercare/support/monitoring;

j) Any ongoing concerns witness had herself or others advised her of?

k) Was there any documentation referenced during or created after the event. For example an incident report?

l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

Write your answers above in the relevant section.

70. Tell me about your understanding of the use of thermal wheels in areas where immune compromised patients are treated:

A My understanding is that they are not recommended for this application due to the risk of potential air bypass from extract systems dependant on the component layout of the AHU of which they are installed.

71. To what extent can you recall any specific events in relation to thermal wheels?

A I do not recall any specific events with respect to thermal wheels other than concern was raised that their use within the original Ward 2A ventilation installation may not be suitable to support the clinical application of an immune supressed patient cohort.

a) What was the issue?
b) The impact on the hospital (include wards/areas) and its patients (if applicable)
c) Who was involved?
d) What was the escalation process?
e) Were any external organisations approached to support and advise?
f) If so, what was the advice?
g) Was there opposing advice and by whom, and what was the advice?
h) What remedial action was decided on and who made the decision?
i) Was the issue resolved – consider any ongoing aftercare/support/monitoring;
j) Any ongoing concerns witness had herself or others advised her of?
k) Was there any documentation referenced during or created after the event. For example an incident report?
l) Did anyone sign off to say the work had been completed and issue resolved/area safe.

<u>Combined Heating and Power Unit</u>

72. Describe the Combined Heating and Power Unit (CHP)

A Three gas fired engines connected to generators located on the ground floor of the QEUH energy centre that produce electricity that is fed back to the Scottish Power network and heat that is utilised to support the flow and return

temperatures of the primary medium hot water heating system that serves the QEUH & RHC allowing for a lesser requirement for running of traditional boilers dependent on seasonal conditions.

a) What is the purpose of the CHP?

A Please see A 72.

b) What condition was the CHP in at handover?

A I do not recall.

c) What information do you have to support your view on the CHP's condition?

A None.

73. Was commissioning and validation of the CHP carried out prior to handover?

A I don't know- Project team to advise.

a) What commissioning and validation documentation did you see, if any?

A None, it was not my position to be in receipt of this information at that time.

74. Refer to Estates Communication Bundle, document p90

a) Who was responsible for ensuring that the commissioning and validation documentation was in place?

A The document would indicate that this was the responsibility of Brookfield Multiplex.

b) Where were records of the commissioning and validation for the CHP kept?

A I believe these where uploaded onto the Zutec portal.

75. Who was responsible for ensuring that the CHP was operating correctly?

A Estates appointed a specialist sub contractor to ensure the safe operation of the CHPs, it would be the responsibility of the builder to ensure they are operating prior to handover and acceptance.

76. If the CHP was not operating correctly, could this impact patients? If so, how? Refer to Estates Communication Bundle, document 12

A If CHPs are not working correctly, they can impact the heating systems ability to achieve the correct flow and return set points, which in turn can affect the temperature that patients experience within the hospital becoming too hot or too cold dependant on the effectiveness of the Medium Temperature Hot Water (MTHW) control strategy.

77. Estates Communication Bundle, document 17:

a) What is meant by labs flushing?

A Flushing of a new system is a standard commissioning engineering practice before interfacing with the medium of which it is to be connected by.

b) What issues, if any, arose from this?

A I was not involved.

c) What is the importance of this?

A It is important to remove debris, deposits within the pipes, and any other unwanted materials that may compromise the performance of your system

d) Discuss your knowledge of the reference to a ‘40 year old system’:

i) Explain what the 40 year system was:

A I believe the are referring to the age of the heating system that serves the Neuro surgery building.

ii) What was the issue(s)?

A It sounds like they are concerned in flushing a old antiquated system can cause additional system failures and leaks.

iii) What was the potential impact?

A Please see ii

iv) What actions, if any, were taken to address the issue(s)?

A I was not involved.

78. What was your understanding of how the CHP should be operated?

A My understanding is that the CHPs where to run all the time to as a base heating medium to be topped up with the sequential operation of boilers to meet the hospitals seasonal heating demand.

79. What were the cost considerations for the operating of the CHP? What considerations impacted on its operation?

A I can't comment on cost as this was not my responsibility, however, the CHPOs are essentially engines that run all the time and can stall under minor component failures such as a faulty spark plug, the QEUH heating system however is resilient from a heat generation perspective in that additional boilers can be started automatically in order to meet a specific set point.

80. How was the CHP system being operated by GGC?

A An appointed sub contractor managed the day to day operation of the CHPs via remote telemetry and site visits.

81. What operational issues, if any, were encountered by GGC with the CHP? Refer to Estates Communication Bundle document 12.

A This document references over heating issues, I do not recall this specific one.

82. Refer to Estates Communication Bundle document 16:

a) Have you seen this before?

A No.

b) What is this document?

A This is a list of FM First Job tickets allocated to the contractor BAM to action.

c) Column 274 – 'all CHPs cut out' – what does this mean? How would this have impacted patients?

A Column 274 reports a G59 issue, which is a mains Protection Relay/ electronic monitoring device that looks at the quality and stability of the mains electricity. It is programmed to certain fixed parameters dictated by the DNO, these typically include voltage, frequency, if these parameters are not met the CHP will go off, this could potentially affect the hospitals heating network should there not be adequate boiler capacity on standby to meet the buildings heat load.

d) Refer to Estates Communication Bundle, document 36 what was the incident referred to? Were you involved? How was this matter resolved?

A No I was not involved.

83. Refer to Estates Communication Bundle, documents 19 & 20:

a) Provide information about the concerns you had in relation to the building temperature and power.

A I do not recall this incident.

b) What was your involvement?

A Please see A-83a

c) Was this recorded on Zutec?

A Please see A-83a

d) What was the impact of these issues on patient migration?

A Please see A-83a

e) Were matters resolved? If so, how? If not, what was the consequence?

A Please see A-83a

84. Refer to Estates Communication Bundle, document 91, page 754:

a) Look at column 78 – what does debris within the AHUs mean?

A t is not clear from this document what the debris was, suffice to say no debris should be within a functional AHU.

b) Is this something you would expect to see?

A No

c) What was the impact on the AHUs?

A I don't Know

d) How was this matter resolved?

A I don't Know

85. What happened in respect of Zurich?

A I don't Know

<u>Water Guidance and Obligations</u>

86. What guidance applies to water? How did you/others ensure that guidance was complied with? What contractual documents, if any, would you consult to ensure guidance was complied with?

A SHTM-04 parts A-G, I was not responsible or trained and appointed for the management of water systems.

87. Who was responsible for ensuring a safe water supply following handover?

A Operational Estates.

88. What water safety training was provided to all maintenance staff, estates officers and contractors?

A I don't know.

.

89. What was your knowledge and understanding of Health and Safety regulations on control of legionella at the time?

A Please see A-86

90. What legionella training was provided to all maintenance staff, estate officers and contractors?

A I don't know.

91. What water borne pathogens (other than legionella) training was provided to all maintenance staff, estate officers and contractors?

A

92. Who was the Dutyholder?

A I don't know.

a) Were you aware of obligations to appoint an authorised person or the like to discharge water supply safety? If so, who was appointed? When, for what period? If not, why not?

A I was aware that these obligations were the responsibility of a designated person but did not know who that was at that time.

b) What is the importance of appointing a Dutyholder and authorised person? Was this done at QEUH/RHC?

A Given my experience today in my current role I can advise that appointing a dutyholder and authorised persons for any discipline is fundamental in establishing a hierarchy of management that supports compliance and maintenance of any system under MEP.

Water - Commissioning and Validation (C&V)

93. What commissioning and validation documentation did you see prior to handover in 2015 – if not, who would have had sight of this?

A I don't know, the project team should have had sight of this.

94. Where is this commissioning and validation documentation ("C&V") stored generally on the hospital system?

A If it was available, it would be stored on the Zutec platform.

95. what concerns, if any, would you have If the water system were to have no C&V before handover in 2015? Why were you concerned?

A I would be concerned that no system can be considered fit for purpose if it is not commissioned and validated prior to its use.

96. Describe the same in respect of verification and the cold-water supply system.

A Please see A-94

97. What C&V of the water system was carried out post-handover?

A I don't know.

a) Who was responsible?

A I don't know, in my experience this should be carried out pre handover.

b) How was the C&V recorded?

A I don't know.

c) Any concerns arising from post-handover C&V? If so, why did these concerns arise?

A I had no concerns at that time.

Water system – general

98. Describe any ward/area specific water systems used?

a) Detail the individual ward water specification

b) What were/ are your thoughts about this

c) Why, if applicable, did certain wards have differene water systems

d) Was there a standard protocol for sanitising water systems?

A At the time as a newly appointed estates duty manager who was not involved or appointed in water management I only had a high level overview of the QEUH water systems in that the building was served by separate water supplies that entered the (Adults) basement tank room via separate water metres serving two raw water tanks, these tanks fed at the time two viola filtration units that fed two filtered water tanks, the draw off from both these tanks went to a manifold arrangement that fed two sets of booster pumps, 4 bar and 7 bar that served different areas of the hospital (4 bar lower levels & 7bar for higher).

99. To what extent were the standard protocols for sanitising water systems used on a system of the size and complexity of this one?

A I don't know.

100. Were consultants brought in to advise on sterilisation of the water systems?

a) Who were they?

b) Had you worked with them before?

c) Describe and comment on the methodology used.

d) Who decided to accept it or not.

e) Did it work?

f) What paperwork or records were kept in relation to their installation; maintenance or flushing?

g) How were these kept, on paper or electronically?

h) What equipment for recording work was used by employees doing day to day tasks?

i) How was that then reported back and checked?

A I believe a company called DMA Canyon where employed to advise and assist on the sterilisation of water systems and reported to Ian Powrie directly who would be best placed in my opinion to answer the above questions regarding methodology, acceptance and record keeping.

Water Maintenance

Refer to Estates Communication Bundle, document 10.

101. Explain the cleaning and maintenance of the water system, taps, drains, shower heads etc. When doing so consider:

a) What is the cleaning regime?

A I am not trained in water management nor was tasked or appointed to carry this out at the QEUH during my employment, my disciplines where electrical and mechanical not plumbing and water management.

b) What is dosing?

A Dosing is when a water system is treated with specific chemicals in calibrated quantities to maintain water quality at wholesome parameters.

c) Why was chlorine dioxide used in the cleaning regime. IMT bundle, document 30.

A I was not involved in the decision making process to include Chlorine dioxide as part of the cleaning regime, this was led by Ian Powrie.

102. Who was responsible for the effective management of and installation of the point of use filters?

A I believe this was the contractor DMA Canyon managed by Ian Powrie.

103. How often were you aware of the filters being changed? Were the manufacturer's recommendations followed?

A I recall frequency of change being by monthly and monthly depending on the rated filter installed.

104. How involved were you in decisions relating to water testing?

A Please see answer 101 a.

105. If not, who was responsible for these?

A Ian Powrie

106. What do you understand about management of water testing? What do you understand about decisions on when water testing should be undertaken?

A I understand water testing is a legal requirement and is outlined in hospital guidance SHTM0401.

107. In her statement Dr Teresa Inkster states *'there was a direction from Mary Anne Kane, who was at senior director level, not to give microbiologists access to water testing results'*:

a) What is your reaction to this statement?

A I have not seen this statement however it is my believe that all information should be shared between parties especially when it concerns patient care.

b) Why did estates direct that microbiologists should not have access to water testing results?

A I don't know.

c) Have you ever been advised not to contact someone/ not to provide water testing information? If so, when? By whom? and why?

A No

d) Have you ever refused, or directed others to refuse to provide water testing information requested by microbiologists or infection control? If so, why? Provide as much information for your rationale and the consequences of withholding information.

A No

e) Provide information on how you dealt with requests for water testing results from microbiologists and infection control - was all the information requested provided? If so, what was provided? If not, why was paperwork not provided?

A Any requests I ever received for information at the QEUH for any building services were passed to my line manager for approval.

f) Who was responsible for dealing with these requests for information?

A I don't know.

g) What was your role in dealing with these requests for information?

A I did not have a role in dealing with requests for information regarding water.

h) How were these requests for information managed by your department? What steps did you take?

A Please see A-107 e

i) What concerns, if any, did you have with how matters were being handled? If so, what steps did you take in response to these concerns?

A I was not involved in how these matters were handled.

DMA Canyon Reports

Refer to Bundle 6 – Miscellaneous documents – documents 29 and 30.

108. How many times did DMA Canyon mention the report during their time on site between 2015 and 2018? If so, when and what was mentioned?

A The only time I personally dealt with DMA Canyon was to facilitate their access to site to carry out pre determined work by others, or pass their findings onto the relevant person of their charge should they not be able to liaise with that individual on their day of visit, which was rare.

Taps

109. The use of Horne Taps was discussed in the IMTs relative to the water incident. IMT Bundle.
Please confirm:

a) Your understanding of use of Horne taps.

A My understanding of Horne taps is limited to my awareness that they have been previously installed within hospital settings as a result of historical design and component selection.

b) Who authorised the use of Horne taps?

A I don't know.

c) Why were Horne taps selected?

A I don't know.

d) How involved were you in the decision to use Horne Taps – NSS SBAR Bundle, document 1 - please discuss your involvement and understanding.

A I had no involvement in this matter.

e) What is your recollection of the views about the use of Horne taps – please explain your recollection of the use of Horne taps.

A My only recollection after reviewing document 1 is that there was an appetite to remove them because of the Infection control risks they presented.

f) At the time, were you aware of the incidents in Northern Ireland with Horne Taps?

A No.

Water Technical Group

110. The water technical group (WTG) sat between 2018 and 2019. Estates Communication Bundle, document 133:

a) What is the purpose of WTG?

A I had no involvement in the water technical group.

b) Who was in the WTG, what were their names and their roles within WTG?

A To my knowledge : Ian Powrie, Andy Wilson, Colin Purdon, Mel MacMillan, Dennis Kelly(AE Water)

c) Why was the WTG set up?

A I believe it was to promote and manage water safety within the QEUH Campus.

d) What qualifications were required in order to be chair of WTG?

A I don't know.

e) Refer to IMT Bundle documents 39 onward, and any other IMTs as a result of WTG. Go through and discuss issues – impact of patients – what was cause of these issues.

A I was asked to attend this IMT 3rd July 2019 as estates representative in the absence of my colleagues who manage water where I received an action to contact the company that carries out the water testing to make sure that their sequence of obtaining the water samples was correct and no cross contamination had occurred in their results.

f) Did you follow through with this action? If so, what happened following your involvement?

A I would have responded to the IMT action with a simple email or conversation. Following the IMT my action was to confirm that the sequence for obtaining the water samples was correct. The IMT discussion was around whether there could be contamination from touching taps and other areas within the room while obtaining the water sample. It's my understanding the IMT where looking to confirm the water sampling process would not compromise the results of the water testing. I believe that I informed Colin Purdon following the response – he normally attended either him or Andy Wilson. I can't recall if I reported the response to them or IMT directly, but I always carried out every action that I was given following an IMT. I can't now recall if it was an email that I sent or a phone call but I would have followed it up.

Other water incidents

111. What other specific events do you recall in relation to water? Do you have any recollection of debris in the water tanks, if so, please explain:

a) What the issue was;

b) The impact on the hospital (include wards/areas) and its patients (if applicable)

c) Who was involved;

d) What was escalation process;

e) Were any external organisations approached to support and advise;

f) Detail role and function of HPS and HFS, advise if they were involved and any reports prepared by them;

g) Detail advice given from external organisations; what was the advice, did you agree with it, how was any advice managed/ communicated with others in your team and your superiors?;

h) Was there opposing advice and by whom;

i) What remedial action was decided on and who made the decision;

j) Was the issue resolved – consider any ongoing aftercare/support/monitoring;

k) Detail any ongoing concerns you had, or which you were made aware of;

l) Was there any documentation referenced during or created after the event? i.e. an SBAR/ minutes from a meeting – use the bundle provided to assist.

m) Did anyone sign off to say the work had been completed and issue resolved/area safe?

A I was not involved with the management of water at the QEUH nor was I trained or appointed to carry out these duties.

112. What were the NHS procedures for raising concerns about water or water infections.

a) How were these dealt with by you?

A If concerns were ever raised to me regarding water issues I would escalate them to Colin Purdon so they could be allocated to the correct personnel and addressed accordingly.

b) How was it confirmed they had been dealt with.

A I don't know.

c) Do you recall specific ones and in particular any that gave you concern.

A No.

<u>Ventilation - Commissioning and Validation</u>

113. Describe the commissioning and validation process in respect of the ventilation system in the QEUH/RHC.

A I was not involved in the commissioning and validation of the ventilation systems at building handover.

a) Who was this carried out by?

A The commissioning would have been carried out by Brookfield Multiplex subcontractors Mercury Engineering, Schneider controls, & H&V Commissioning, to my knowledge the systems were not validated.

b) Who signed off?

A I don't know this would have been the responsibility of the project team and the nominated stakeholders for acceptance.

c) To what extent, if any, did infection control have input prior to sign off? Refer to Estates Communication Bundle, document 22. For reference in this email Christine Peter's states that Craig (Williams) has not seen anything in writing about the ventilation.

A I do not know what input Infection Control had with respect to sign off, this would be for them and the project team to advise.

(i) If so, who?

A Please see A-113c

(ii) When should this have been done?

A On client acceptance and prior to patient occupancy.

(iii) Were you involved?

A No.

d) Were you aware of any concerns raised at any point about the ventilation system and its commissioning?

A When I took over the management of the ventilation systems at the QEUH in March/April 2018, part of my initial assessment was to consolidate an accurate documentation inventory for all ventilation assets at the QEUH, it was at this point I found no Validation information for the ventilation systems was available.

e) In your opinion, had validation of the ventilation system been carried out prior to handover? If not, what is the potential consequence of this having not been done?

A In my opinion no, from what I learned. It is important to say that when people talk about validation and verification they get the two mixed up; validation is a

first pass of acceptance following on from commissioning. When I took over management of the ventilation system I had to ensure that we kept going what was up and running from pervious maintenance strategy. I also tried to get a complete asset register for the whole campus. I wanted detailed list to enable us to target maintenance to ensure compliance. Alternate critical assets had to be planned and scaled in. The theatre assets register was up and running, as it had to be in order to comply with SHTM, which included annual testing of the isolation rooms.

It was a big learning curve for me, I was not Authorised Person for ventilation at the time, my role was in management of the ventilation system then. The review carried out on pervious information regarding validation was part of the initiative and it involved looking at available commissioning information. During that process that I could say with relative certainty that I did not see validation information prior to handover. As for the consequence of not doing this, speaking from what I know today, if you don't validate the ventilation system you have no idea if fit for purpose for clinical prupose designed for, or the purpose it was designed and commissioned for at handover, or if it was clearly laid out within design standards. Commissioning is a measurement of what the design was intended to achieve, so of the design says X and the measurement says X the system would meet the design. Validation means 'does it work for clinical requirements and guidance?' there are various examples for theatre. If the system wasn't validated I don't know how anyone would know it was doing what intended to do.

f) What commissioning and validation documentation prior to handover in 2015?

A No

(i) If not, who would have seen commission and validation documentation?

A No this information would have been provided by Brookfield Multiplex and any appointed independent validator for the project teams review and acceptance.

g) What is your understanding of the SHTM guidance in respect of ventilation?

A SHTM-03-01 Parts A&B is Guidance for the concept, design, specification, installation and acceptance testing of healthcare ventilation systems and the management, operation, maintenance and routine testing of existing healthcare ventilation systems.

h) How important is SHTM guidance in respect of ventilation?

A SHTM guidance is fundamental guidance with respect to the design, build and maintenance of healthcare ventilation systems.

i) What emphasis, if any, is there on patient safety in SHTM guidance in relation to ventilation?

A To answer fully I would need to conduct a search of the guidance. But in summary, the documents' purpose is to support patient safety outlining the design, specification, installation and acceptance testing, management, operation, maintenance and routine testing of healthcare ventilation systems to support patient safety, which is at the forefront of the guidance.

i) Was the QEUH/ RHC ventilation system SHTM compliant at the date of handover – if not, what was outstanding? Who was responsible to ensure that the ventilation system complied with SHTM?

A It is the responsibility of NHSGG&Cs project team to ensure all ventilation systems complied with the technical memorandum at the date of handover.

j) Refer Estates Communication Bundle, documents 34, 34.1, 34.2:

i) can you explain the content of this email

A Yes this is an email from Ian Powrie to Craig Williams sharing information provided by Brookfield Multiplex containing a copy of a schedule of isolation rooms and the system commissioning data and schematics forward 4B

ii) please see the documents attached to the email – what are these documents and have you seen them before?

A These documents are a copy of a schedule of isolation rooms and the system commissioning data and schematics for ward 4B, I believe I have seen them before during my time managing the ventilation systems at the QEUH and planning the annual ventilation verification of the ward.

iii) what does this relate to?

A The commissioning information relates to specific recorded data at the time of commissioning such as grill terminal numbers, associated design and measured flow rates and % flow rate measured against intended design flowrate comparison, motor full load and running currents recorded at time of commissioning.

iv) why was Professor Williams asking for this information?

A From reading the email trail I believe Professor Williams is attempting to seek assurance from stakeholders that the specification provides a safe environment for patients.

v) when did Professor Williams ask for this information?

A His email is dated the 7th of July 2015.

vi) When was this information provided to Professor Williams?

A In reading the email trail it looks like this information was provided the same day by Ian Powrie.

k) Discuss the concerns about Ward 4B. Refer Estate Communication Bundle, document 30 - What was the purpose of the SBAR?
Refer to Estates Communication Bundle, documents 30, 31, 32 to assist with your answer.

A Having read document 30 it states that based on the analysis conducted against Nice guidelines the QEUH is not fit for purpose for Haematoncology

patients to remain safely, I believe the purpose of the SBAR is to formally record and manage this perceived issue.

l) What involvement, if any did you have in respect of this matter?

A I was not involved, the answer I have provided is only from reading the document for the purposes of answering this questionnaire.

m) How does commissioning differ to validation?

A Commissioning is simply a measurement of system performance against design Validation differs from commissioning in that its purpose is to look at the complete installation from air intake to extract discharge and assess its "fitness for purpose as a whole". This involves examining the fabric of the building being served by the system and inspecting the ventilation equipment fitted as well as measuring the actual ventilation performance. Validation is not a snagging exercise, Validation is a process of proving that the system in its entirety is fit for purpose and achieves the operating performance originally specified. It will normally be a condition of contract that "The system will be acceptable to the client if at the time of validation, it is considered fit for purpose and will only require routine maintenance in order to remain so for its projected life."

n) Was there a validation document to accompany this for handover?

A Not to my Knowledge.

o) What is the purpose of Commissioning and Validation (C&V)?

A The purpose of commissioning and validation is to ensure all of the elements work as a whole to achieve the project aim.

p) What are the consequences of it not being carried out? What concerns did you have, if any, that the QEUH/RHC had not been signed off without C&V?

A If C&V is not carried out you have no assurance that the system in question is operating to achieve its design intent under commissioning, and is fit for purpose and compliant with hospital guidance under validation.

q) What concerns, if any, would you have if there were no C&V of the ventilation system?

A I would be concerned that the system is not operating to support its intended ventilation strategy.

r) Why would no C&V of the ventilation system give rise to these specific concerns?

A No C&V of the ventilation system would give rise to these concerns because you would have no way of knowing how the system was performing with respect to Air change rates and measured pressure profiles, therefore you could not ensure that the correct level of air dilution was taking place for the space served from that ventilation system recommended by guidance or that the hierarchy of cleanliness (flow of air from clean to less clean areas with robust authority) was in place to support the control of infection rates in clinical areas.

114. What testing and maintenance protocols and regimes were in place?

A Post handover I believe maintenance protocols and regimes were still being established, I recall the priority was to have an annual verification programme in place for the theatres which was led and created by Ian Powrie and David Brattey, by the end of the first year the annual theatre verification programme was in place for all 43 theatres on campus where by each theatre (Adults & RHC) under went its first annual verification to measure its performance against SHTM-03-01 with any remedial recommendations being actioned as part of the 5 day shut down of the theatre suite. Due to the asset PPMs not being integrated onto FM first (CAFM) ventilation maintenance was created, distributed and logged manually on the system as an interim protocol.

115. Should these protocols have been established and in place prior to patient migration? If so, what was the consequence of this not having been done prior to patient migration?

A I think they should have been in place prior to patient migration. Assuming all due diligence has taken place during the handover period, as that is why it has been handed over. From a ventilation verification perspective you would have one year from the date of handover to re-verify against the original validation, which means check that the entire system functions in the way intended and as it functioned at handover. I think that is why so important the program for the theatres was up and running. The consequence of protocols and a verification programme not being in place prior to patient migration is that you have no sight on what the ventilation strategy in situ is, and whether the system is performing as intended. SHTM-03-01 states verification annually as a requirement. To maintain a suitable patient environment, all stakeholders should have visibility of potential risk factors and be advised of the expected timescales of fixed maintenance and PPM. Hospital air change rates, pressure profiles etc exist because the due diligence and science has been carried out by others with regard to air dilation rates and optimum pressure cascades to support patient environments advising what ventilation standards are required to support clinical service.

116. Refer to Estates Communication Bundle, document 47 page 5/18 of document:

This states that air permeability tests were not carried out to 36 isolation rooms:

a) Were you aware of this? If you were not aware, who would have been aware?

A No, this report was generated prior to me working at the QEUH.

b) What was the consequence of this?

A One consequence can be if room permeability is not confirmed to meet the specified standard, then the space can have too much air leakage, resulting in

more challenging to achieve adequate pressure parameters for the space, hence more primary air is required to achieve a specific pressure profile of the room creating plant inefficiency and potential difficulty in validating the system in which serves it.

c) Why did handover take place in these circumstances?

A I don't know.

d) What happened following this report?

A I don't know.

e) What concerns, if any, did the contents of the report give you? Why did the report give rise to these specific concerns?

A Please see A-116a

Have regard to the following emails when considering your answers to the above Estates Communication Bundle, documents 64, 67 and 68.

117. What concerns, if any, did you have about the ventilation system at the point of patient migration to QEUH?

A I was not involved.

118. Where was the documentation for C&V stored at that time?

A I was not involved.

119. Have you seen the ventilation system validation documentation as at handover (Jan 2015)?

a) If yes – who carried this out, who signed off, who authorised?

A No.

b) If no – should you not have sought this? Who is responsible for ensuring it is in place? Who should have chased this up? Would this not be part of ID remit?

A At handover it is the responsibility of the project team to ensure this is in place prior to acceptance, I was not involved in ventilation maintenance at this time.

120. Where would the paperwork have been stored/ Who would have been responsible for it?

A I don't know, this would have been the responsibility of the project team.

121. If validation was not in place at handover, how did the hospital open? Who would have had the authority to allow the hospital to open without validation in place?

A I don't know, this would have been the responsibility of the project team.

122. Were you asked by microbiologists or Infection Control to provide information regarding the ventilation system and validation? Refer to Estates Communication Bundle, document 27. Who was supposed to provide this information? If it was not provided, why not? What action was taken to ensure that information was provided – if it was not, what was done to escalate this? Who was responsible for providing this information?

A Document 27 indicates that Ian Powrie was requested to provide this information.

<u>Ventilation system – general</u>

123. What testing and maintenance protocols and regimes were in place? Refer to Estates Bundle, document 62.

A These are H&V commissioning reports with regard to Ward 4B in October 2015. I was not involved in establishing the testing and maintenance protocols and regimes on Estates receipt of this information.

124. What concerns, if any, do you have relating to the ventilation? What concerns, if any, do you have relating to the water temperature? What concerns, if any,

do you have relating to the movement within the water system? Refer to Estates Communication Bundle, document 123.

A Regarding ventilation at the QEUH and the experience I have gained while involved in its maintenance, my concerns were from an engineering compliance perspective in that any ventilation system that does not meet the minimum standards set out within the technical memorandum regarding air change rates, associated space pressure profiles and rating of filtration, any consequences for maintenance etc. I am not qualified to comment on the risk of shortfalls as I have no visibility or understanding of potential associated infection rates, this would be for the Health Boards Infection Prevention and control team to risk assess and quantify.

125. Was it possible to incorporate a comprehensive ventilation system into the QEUH/RHC?

A Without being involved in the design process required to model and calculate what this requirement would be, I don't know.

126. Describe any ward/area specific ventilation systems used?

A I recall ward 6A was served by three shared AHUs located on level 12 plantrooms that also served levels 4,5 &7 for Tower (A) originally inclusive of G4 pre filtration and F7 secondary filtration that where later upgraded to incorparate F9 secondary filtration. I believe these AHUs included the use of thermal wheel technology as a mode of thermal heat recovery.

127. What are your thoughts about these ventilation systems that were used?

A It is my understanding that ward 6A was classed as a general ward prior to being utilised as a decant solution for RHC ward 2A. The ventilation requirement for a general ward in accordance with guidance available at the time of construction SHTM-03-01 Part A 2014 recommended an ACH rate of 6 per hour and 0 to -VE pressure from the room to corridor for a single room, within ward 6A this was found not to be achieved as a result of under rated system capacity. SHTM 03-01 also outlined for a Neutropenic patient

ward,10 ACHs and 10 pascals positive pressure from room to corridor was required. I believe the patient classification from the patient cohort from ward 2A was classed as Neutropenic. In both instances my thoughts are that the principal ventilation performance is not in accordance with the recommendations within guidance at this time.

128. Refer to Estates Communication Bundle, document 136. Explain the concerns regarding laten defects and actions taken.

A From reading this bundle the concerns relate to ventilation, potable water and derogations relating to ward 2A Schiehallion. Paragraphs 2 & 3 on page 953 section (d) within the bundle relate to a design proposal intended to comply with BREEAM and a concern is raised about the proposal's suitability and consideration for Haematoncology and neutropenic specialist areas. I believe this may have been a contributing factor in deciding the commencement of ward refurbishment upgrades.

127. What involvement, if any, did you have in respect of this matter?

A I was not involved, the answer I have provided to the above question is just from reading the documents for the purposes of engaging with this questionnaire.

<u>Specific events in relation to ventilation system</u>

128. Can you recall any specific events, if so, describe your involvement, action taken and any concerns you had at the time?

A I consider that I have already spoken to this in my evidence. A couple of key issues come to mind, certainly I had advised within the decant of Ward 2A to 6A. Once I took over management of the ventilation systems there was more of an appetite to understand general ventilation systems that were not verified and only had original commissioning information on ZUTEC available associated with their recorded performance. In my experience there became a clinical and estates appetite from my line managers to be able to feedback what

pre-existing ventilation strategies were for example Ward 6A; what was it, how it was designed, commissioned, what restrictions there are, was it maintained as a critical or general ventilation system, what improvements could be made, how can they be improved and how can risks be mitigated within the parameters of the building. I had a lot of involvement in doing the option appraisals for Ward 6A and I did an option appraisal of Ward 4C. Those tasks assigned to me by Alan Gallacher and Tom Steele were to provide a line in the sand of pressure profiles for the rooms and what the pre-existing air change rates were for those rooms. This is not something you would generally have for a non-critical ventilation system. The report that was generated for this work had technical information but also schematical diagram information for people not necessarily mechanically trained so people could understand flow of air from clean to less clean areas, the hierarchy of cleanliness. That information would be reviewed by other line managers, IMT, and they would decide and have visibility of how the ward was being used, what it's intended service application was and the ideal ventilation strategy to support this. My actions would be say for Ward 4C; to scan the whole ward; as expected pressure profiles were either zero or negative, the appetite was to have mostly positive room pressure profiles hence conduct a rebalancing exercise to try and make patient rooms marginally positive pressure to the corridor. This was achieved by layout review of the system by our specialist contractor and subsequent system rebalancing to ensure any rooms that were negative from corridor to room were rebalanced to make them notionally positive from room to corridor. I provided options appraisals for my line managers consideration and review to try and optimise the ventilation strategy to suit the clinical environment with the understanding that it did not meet the outgoing guidance standards for that of a general or immune compromised setting.

Isolation Rooms

129. What was the issued referred to in the email at Estates Communication Bundle, document 34? How did this happen?

A Having reviewed the bundle document 34 I believe the issue was Brookfield not carrying out DOP testing for HEPA filter challenge tests.

130. Discuss the air permeability testing carried out in respect of the isolation rooms Estates Communication Bundle, documents 37 & 41:

a) Why was this work carried out?

A This is a requirement of SHPN-04-01.

b) What was the result of this work?

A The results are not clear to me from the email trail.

c) what was your involvement in the work?

A I was not involved.

131. Refer to Estates Communication Bundle, document 26 Christine Peters refers to sealing light fittings:

a) What was the issue?

A The issue reads to be gaps between the light fittings and ceiling presenting a permeability risk within the fabric.

b) What was the potential impact on patients?

A I don't know, however a breach in fabric can cause difficulties in achieving the required pressure profile for the room.

132. Dr Christine Peters tell us that she raised issues with you regarding the accommodation of an immune suppressed patient on 16th July 2019. She tells us that

'The patient was being nursed in a negative pressure room that did not have a HEPA supply. They were then moved to a PPVL room without a HEPA supply. There was clearly confusion regarding correct placement and the PPVL room had a pressure of 20 pascals which was out of specification. I raised this with the Estates team and in particular, Darryl Conner'

Discuss these issues with reference to the Estates Communication Bundle, document 140:

a) Your understanding and involvement

A I would normally have followed up such a request in writing. My email response is not included in the email exchange. Due to the passage of time I cannot recall Dr Christine Peters raising these concerns, however my role would have been to provide any information available or by further investigation on the pre existing ventilation strategy and levels of filtration in place on request.

b) work carried out

A I do not recall.

c) Potential patient impact

A I don't know.

133. Any other matters relating to isolation rooms that you wish to add comment on:

A Not all isolation rooms at the QEUH where fitted with terminal Hepa Filtration, this was a clinical and IPC selection process pre hand over that I was not involved in.

134. What action, if any, do you recall being taken in response to this? Describe your involvement, if any?

A I had involvement in a sense; the placement of patients and use of facilities sits firmly with clinicians and IPC teams, they are suitably trained and they provide patient care and how they the facilities and services sits with them. My role when I was in managing ventilation, was to provide with them as much information about what they had, bearing in mind that things were changing, and I was not aware of their previous understanding. That is why I don't remember that particular event, as there is not a specific isolation room referred to. Fundamentally, I would have responded back by phone call or email to

investigate. For example, if a room was out of pressure, I would look at controls, the PMS, look at plant, is it out of parameter, investigate, check verification documents.

As far as HEPAs are concerned, I don't know what the rational is between PPVL across campus and not having all them with terminal HEPA filtration, but do believe SHTM 04-01 supplement 1 states that there should be facility to include at a later date if required, so the request to install HEPA would have to come from there, and if that was a request I would have facilitated it by challenge testing, rebalancing the system, producing a report. In today's age you have Ventilation Safety Group, so now stakeholders, CIP, clinical representation, operational estates etc share a common table to discuss these issues on a regular basis, but that type of information at the time would have been communicated to the stakeholders.

Ward 4B

135. What was the intended purpose of Ward 4B?

A I understand the purpose of Ward 4B is to provide a safe environment for the treatment and care of adult Bone Marro Transplant Patients (BMT)

136. Did this change prior to January 2015? If so, what changes were made?

A I don't know, the project team would be best to advise.

137. What, if any, changes were required to the ventilation system? Why were they made?

A Ward 4B is not served from the general tower AHUs located on level 12 of the QEUH, they are instead served by dedicated AHU located on level 3 Plant room 31 to provide a dedicated ventilation strategy to support the ward and the clinical processes that take place, I believe this is one of the changes that where carried out at the very early stages of handover managed by Ian Powrie.

138. How involved were you with the changes?

A I was not involved.

139. Refer to Estates Communication Bundle document 62:

a) What is this document?

A This is a ventilation report for ward 4B outlining the commission values of AHU 31-63.

b) Have you seen it before? If so, when?

A I believe I would have as I have organised ventilation verification of ward 4B in my past role as Authorised Person.

c) What was the purpose of carrying out a ventilation report in October 2015?

A To compared how the measured commissioning values compare to that of the design.

d) Did any issues arise from this report?

A I was not involved in the review or acceptance of this report.

e) How involved were you?

A I was not involved.

f) Was this not within your role as Authorised Person? If not, who would have been responsible for action this report? What concerns, if any, did you have regarding the 2015 ventilation report?

A I became Authorised Person for ventilation around January/ February 2019, this was prior to my being appointed.

g) What matters, if any, did you escalate arising from this report? If so, to whom and why?

A I was not involved.

Decision to close wards 2A/B and move to 6A and 4B

140. Discuss the issues surrounding and leading up to the decant of patients from Ward 2A in 2018.

a) What was the lead up and background to this refer to Estates Communication Bundle, document 133.

A I was not involved in the decision to close wards 2A/B and move to 6A and 4B.

b) What was your involvement.

A My only involvement was to ensure that all AHU plant serving ward 6A was checked and serviced at the request of Andy Wilson in preparation of the move.

c) What risk assessment and additional measures were put in place to ensure patient safety?

A I recall a hive of estates activity in ward 6A at that time inclusive of fabric repairs, plant servicing, lighting and nurse call checks, installation of point of use filters in readiness for this move.

d) Do you recall risk assessments being carried out, if so by whom?

A Andrew Wilson would have been involved in decision making. Andrew Wilson asked find out what ventilation plant was serving Ward 6A and to make sure what ventilation was serving 6A make sure all serviced.

e) Did you have concerns about ventilation in Ward 6A being suitable for patients from Ward 2A?

A Yes, I always knew that Ward 2A was BMT, TCT, haemato-oncology ward, so very a specific ward for immune compromised patients, and I knew that the majority of wards in the adult hospital were tower wards or as you would say general wards from shared ventilation. I had personal concerns, but the risk

assessment piece and all the other moving parts, and the people involved, took into account other variables beyond what I was privy to in order to make that decision. My role was to make sure that the plant which served Ward 6A was in a suitable state, which it was, and that was documented. The Estates team knew Ward 6 A was general ward type, but that was being assessed through I would imagine an IMT, whoever the body of people would have been they would have assessed that. I wasn't involved risk assessment. I don't know if one was carried out. I would imagine there would have been, there certainly should have been.

f) What concerns, if any, did you have about where the patient cohort was being moved to?, If so, why did you have these concerns? IMT Bundle, document 39 you flagged concerns, were these ever followed up? Did you escalate these concerns? With the benefit of hindsight, what steps could have been taken to progress this matter further?

A I did not flag any concerns within IMT Bundle, document 39, this risk assessment and IMT was conducted by others.

g) Discuss and detail the works done to Ward 2A/B what was required to be done and why, what has been done and when the work was completed. Please include details of your involvement. Reference IMT Bundle to assist.

A Works were highlighted to be carried out for Wards 2A & 2B because of various surveyed non compliances that resulted in the discussed patient decant. The project works where comprehensive and are well detailed within capital planning contract record. With regard to ventilation within these spaces a complete plant replacement of all systems was to be carried out in order to address ventilation non compliances in order to facilitate a dedicated plant allocation to serve various types and styles of isolation rooms from Positive Pressure Lobby (PPL) to Positive pressure Isolation room (PPIR) Negative pressure Isolation room (NPIR) and BMT corridors to support patient pathway and movement. My involvement was to review capital design proposals from an operational estates perspective and provide my feedback and observations

of the proposed design intent. I had expressed my concerns around the new proposed design to the assistant director of estates and facilities Gerry Cox, who asked me to re write what I thought the client ventilation specification should include for Ward 2A taking into account existing guidance, good industry standards and the intended clinical application for the ward. I created and delivered this client specification for Gerry Cox and Alan Gallager including what I believed the brief should have been for this ward and attached a Version tracker to it as V2 after the initial V1 created by Ian Powrie. I believe after this submission and through the duration of the refurbishment various versions succeeded mine during its construction commissioning and handover. I left GG&C estates in July 2020 to work with NHS Scotland Assure prior to the project being completed and handed over.

h) Describe your concerns around the new proposed design?

A There was the Innovated Design Solutions report which outlined all the pre-existing shortfalls and compliance with guidance, but whatever the driver was to carry out the works to Ward 2A, I recall discussions with Ian Powrie and other designers, being an estates manger, I got to sit in on these discussions. As my role developed and the project progressed, I had sight of the design progress and review of certain aspects, as ultimately estates would inherit this as an estate's maintenance asset. I remember continuously going to meetings and hearing concepts that I knew to be to a non-compliant standard, so I regularly voiced opinion about what standards were and why certain things weren't being included within the design. I recall at one point the assistant director for estates and facilities Gerry Cox saying, 'Darryl would you be able write a client brief of what you think the design intention should be'. I have discussed this above in my answer. I brought in Authorised Person for ventilation at time Jim Guthrie, specialist contractors and other engineer for ventilation. I had idea of what was proposed and what the demographic of the ward was to be, an awareness of current guidance and what interim guidance soon to be release from HFS, I derived what I believed the ventilation strategy for the ward 2A rooms should

be. I did a report tracked as Version 2, Version 1 was by Tersea Inkster/ Ian Powrie. As per my earlier answer prior to the work being completed.

My concerns were surrounding what I perceived to be the non-compliance aspects of the existing design proposal. The original concept was to upgrade TCT part to provide suitable air change rates and pressure profiles to support the intended patient group, and at this stage it was looking like TCT and haemato-oncology rooms wards be of a higher standard than BMT ward. It was all about ensuring that we had dedicated plant for each of the isolation rooms, dedicated plant that if a corridor was to be of a neutropenic standard in a patient pathway that it should be of a higher standard; 10ACH, 10 pascals and it should be a of lesser level to that what the rooms where to be as identified as being of a higher level of cleanliness.

i) Were your concerns listen to and take on board?

A I believe they were, however as the project progressed my understanding was that different versions of the brief were agreed to fit project requirements agreed by James Huddleson of capital planning and his team. I left GG&C to work for NHS Scotland Assure over a year before project completion therefore was not involved In the handover and acceptance of this facility.

j) Are you aware of what the current ventilation specification is?

A I don't know what the final specification ended up being, I would presume that the TCT patient rooms will have at least have 10ACH , with corridor ACH rates of 10 ACH and a positive pressure of 10 pa to less clean areas. My understanding is that the BMT side of Ward 2A probably now includes 4 BMT isolation rooms, 3 PPVL Isolation rooms and perhaps a negative pressure room (but I don't know whether this was done in the end), and a MGBT room at bottom of wards which dealt with radiation therapy for cancer treatment all served by dedicated ventilation plant and suitable HEPA filtration. I don't know what the finalised agreed design was, how it was completed and how it was validated, but I do know that it was a long design and construction period at

significant expense, and is likely a fantastic provision against its previous standard prior to its refurbishment.

141. Discuss the issues surrounding the ward 2A patients when in occupation of ward 6A. In particular, views you may have in respect of:

a) Chilled beams;
b) Gram Negative Bacteraemia
c) Water filters
d) Ventilation
e) issues/ testing/ escalation/ response/ IMTs/SBARs impact on patients
f) Patient communication
g) Internal escalation - HAIIT scoring
h) External escalation

A Views I have on the use of chilled beams within a clinical setting is that they are not recommended for use because of their risk of system leakage, risk of condensation under certain conditions, their restriction of air flow to support higher air change rates and the increased maintenance requirements due to the need for regular cleaning if they are to remain working efficiently. The current out going version of SHTM-03-01 advises “Chilled beams should not be installed in clinical areas without the agreement in writing of the VSG”.In regard to ventilation for the occupancy of ward 6A, the standard for ventilation to be delivered for a neutropenic area is as follows : the 2014 standard notes a room requirement for 10ACH, +10Pa (within Table A1), however does not necessarily differentiate between the patient bedroom area and corridor in the same way the 2022 now does (i.e. the 2022 standards clarifies the hierarchy of cleanliness as +15Pa in the patient bedroom, with the adjacent corridor at +10Pa relative to other adjacencies) Ward 6A was a general ward served by shared ventilation with sub optimal Air change rates required for a general ward (6 ACHs per hour) anything less than the current standard recommended raises concerns around infection rates. Mitigating measures to reduce this short fall where implemented for the duration of the decant to reduce this risk within the fixed as built parameters of ward 6A such as plant

rebalancing to optimise air flow and moderately increase ACH rates where possible, upgrading of source AHU filtration from F7 standard to F9, system rebalancing to provide a notional positive pressure cascade from patient rooms to corridor, installation of fixed ensuite Heppa filters to reduce the levels of particulate in secondary air within the patient rooms and ensuites.

Reports prepared by Innovated Design Solutions October 2018

142. Refer to Bundle 6 – Miscellaneous Documents – Documents 33 and 34. These documents are feasibility studies regarding increasing ventilation air change rates within Wards 2A and 2B by Innovated Design Solutions.

a) Who commissioned these reports?

A I believe it was Alan Gallagher that commissioned these reports from INNOVATED DESIGN SOLUTIONS.

b) What was the background to these reports being commissioned?

A I believe the health board wanted to survey the possibility of increasing ACH rates within these areas and gain an overview of the pre existing ventilation strategy.

c) Why were these reports commissioned? What issues prompted the instruction of these reports?

A Please see A- 151b

d) What concerns, if any, did you have regarding the ventilation system in Ward 2A?

A I did not have concerns up until this point as previous limited ventilation verifications had been carried out by other colleagues and no outstanding concerns where evident to me other than not all the ventilations systems had undergone annual verification due to challenges in access and continuity of service.

e) When did these concerns arise? Was anyone else in estates concerned? Why?

A I believe the concerns were raised off the back of these reports as a result of ongoing suspected hospital acquired infections.

f) What was the impact on patients?

A This would be for clinical and IPC teams to advise but ultimately the patients were decanted to different locations to facilitate the refurbishment works.

g) What concerns were raised with anyone?

A I don’t know, Alan Gallager would be best to advise.

h) What concerns, if any, did you have regarding the ventilation system in Ward 2B?

A At the time, I did not have any concerns around ward 2B as my understanding was it was an outpatient ward.

i) When did these concerns arise? Was anyone else in estates concerned? Why?

A I believe it would have been the suitability of the ward environment for this patient group.

j) What was the impact on patients?

A Please see Answer-f

k) What concerns were raised with anyone?

A My understanding is that all concerns were discussed and raised by the IMT stakeholders involved with the incident.

l) What happened in response to these reports?

A Early design meetings were called between the capital planning and estates teams to review non compliances and refurbishment design considerations.

m) What matters were escalated arising from these reports? If so, to whom, and if not, why not?

A I don't know.

n) What works, if any, were carried out in response to any findings in these reports?

A A full refurbishment of ward 2A & 2B was carried out.

Cryptococcus

Refer to the Cryptococcus Bundle to assist.

143. Recall your understanding of the Cryptococcus infections in 2018:

a) What is Cryptococcus?

A My understanding of Cryptococcus is a fungi that can lead to an infection in patients with comprised immune systems. Its origin in my experience has been reported to spawn from spores of dry pigeon guano atomised within the air and breathed in by an individual/patient.

b) Describe concerns, if any, you had in respect of pigeons at QUEH/RHC? If you had concerns when did these concerns initially arise, and for how long/ how often did such concerns arise?

A I did not have any concerns about pigeons. I had not heard about Cryptococcus previously. I had no concerns, there had been occasions when other colleagues have reported to the company GP Environmental Ltd such as breaches in fabric, cleaning up mess of a similar nature. As a result areas of concern would have pigeon netting installed to keep the pigeons out and cleaning of any mess if required. We had H&V Commissioning in doing

balancing works and I recall a member of H&V Commissioning staff sent me a couple of pictures of a dead bird. I delegated this to an estates supervisor Frank Green to contact GP Environmental Ltd to come in and clean accordingly. Approximately one to one and a half weeks later Ian Powrie came and advised me about the incidents and informed me that we had to assess the plantrooms. I think I went that night to level 12 with a drawing of the plant rooms and marked all the areas with pigeon droppings on the drawings.

c) Describe your involvement, if any, in respect of pest control management in relation to pigeons at QEUH/RHC? Describe your involvement, if any, in respect of instructing works to be carried out in respect of pigeons at QEUH/RHC?

A I could count on one hand on the occasions when I personally called out GP Environmental Ltd. I would not normally deal with this, it would come through FM First and would be distributed by supervisors. To that extent I did deal with it a lot when I was supervisor at the Western Infirmary.

d) Had you seen/ heard of Cryptococcus in a healthcare setting prior to QEUH.

A No.

e) What were the issues with Cryptococcus at QEUH? When did you first become aware of these issues? What concerns, if any, did you have surrounding Cryptococcus? Had you seen anything that caused you concern? What happened in response to these issues?

A I was informed by Ian Powrie in [redacted]2018 that a patient had passed away and it was suspected that Cryptococcus was one hypothesis of the cause. I had never heard of this infection before and knew nothing of its cause or management. I was instructed to survey all plant rooms on level 12 plantrooms for bird droppings and marked a large plantroom layout drawing of all areas where I could visually see it, I signed and dated the drawing and passed for Ian's review the following morning. An IMT was formed quickly after this inclusive of clinical,IPC,estates and specialist stakeholders to review

the issue and to generate areas of hypothetical cause that where to be investigated and reviewed by the group in order to implement the necessary control measures to reduce the perceived risks. A significant action plan was generated by the IMT that included actions for estates including a full clean of all plantrooms within the hospital starting with the plantrooms on level 12, A collation of pictures and photography demonstrate areas of concern and cleaning progress provided by GP environmental. Inspection and repair of any holes or breaches within the plantroom fabric of level 12, a full collation of all maintenance records, layout drawings and survey of associated ACH rates and pressure cascades was requested to support an ongoing investigation lead by John Hood. Prompt servicing of level 12 AHUs in question including filter upgrades from f7 to F9 and a AHU filter frame inspection carried out in the presence of John Hood.

f) Describe your involvement, if any, in air sampling from the plantrooms. When was this carried out? Why was this carried out? Was this routine carried out prior to December 2018, if not, why not? Describe any concerns you had in respect of the air sampling results from December 2018, or at any other time?

A I was not involved in air sampling. I am not a microbiologist, but I did help John Hood and his team by facilitating access. I would have no way to understand the air sampling results from 2018.

g) Describe your involvement, if any, with cleaning of the plant rooms at any time but in particular, in early 2019. Including instructing cleaning to be carried out, to whom, why and when? Was the cleaning more specifically done in 2019?

A Colin Purdon and a person called Alan GP Environmental, were involved in cleaning of all plantrooms in QEUH. It was more specifically done in 2019, the level of cleaning whole campus certainly was reactive. There were protocols for plant room inspections and CAFM and dedicated personal in estates to carry out operatives, and estates would have carried out PPM, but certainly the level of cleaning carried out increased, there was a large number of

personnel, over long period of time carrying out the cleaning, to the extent that the plantrooms were immaculate afterwards.

h) If cleaning was carried out, why was it carried out?

A Certainly, it was needed for plantroom 123 where the main level of pigeon ingress was observed. That was the biggest concentration of droppings and needed specialist contractor, protocols and PPE etc. I think the cleaning was a belt and braces approach, in that it was thought, if this is a potential risk hypothetically it was diligent to carry the cleaning to other areas.

Refer to document from GP Environmental Ltd dated 8th January 2019:

144. What concerns, if any, did you have on reading that there was *'a very large population of feral pigeons present at various locations…*'

A This document was addressed to Karen Connelly, I don't recall having read it however its content supports the response carried out by GP Environmental at that time.

145. What concerns, if any, at the time did you have about the *'Significant Health and Safety Issue'* what further action was taken, was this escalated? If so to whom? Were HPS/ HFS involved? If not, why not? What concerns, if any, in this regard do you have now?

A I recall being concerned about the incident as a whole and wanted to provide assistance where I could contribute to assist in providing assurance that what could be done from an estate's perspective was being done.

146. What action, if any, was taken follow receipt of this document from GP Environmental Ltd?

A I don't know, Karen Connelly to advise.

147. What methods of cleaning were used by GP Environmental Ltd and why? Did this resolve the issue(s)?

A I recall the supervisor from GP Environmental (ALAN) explaining that they douse the droppings in a chemical which neutralises the bird droppings in readiness for clean-up. I can advise that risk assessments and method statements where likely submitted prior to any works commencing, I don't recall reviewing these RAMS personally.

148. Were GP Environmental Ltd instructed previously in respect of pigeons at QEUH/RHC, if so when, and by whom?

A I believe David Bratty had instructed their services previously for attendance to deal with issues in plant room 41 of the RHC hospital.

149. Describe the repair works to 'holes or breaches in the plantroom fabric', why was this carried out? What concerns, if any, were there with holes and breaches in the fabric, how did this relate to the suspected Cryptococcus cases?

A I believe GP environmental made remedial netting repairs to surveyed breaches in the plantroom fabric prior to this being properly addressed by the builder Multiplex at a later date. I believe these breaches in fabric related to the cryptococcus incident as it was considered one of the ways birds were getting into the plantroom and as one Hypothesis at that time was that these droppings may have been a contributing factor to the cause of these cases, this became a point of concern.

150. Why was upgrading filters considered? What other concerns, if any, were there in respect of filters? What further tests, if any, did you carry out in respect of filers and why? To whom, did you report any findings to, and what action, if any, was taken?

A Upgrading of the filters was considered in relation to providing and increased level of filtration to the areas concerned with minimal to no impact on the delivered air flow rates that supported existing air change rates. I believe I contacted our filter manufacturer Camfill to request what filters where available that could potentially support this, I then provided a report by email

to Ian Powrie, Tom Steel & perhaps Colin Purdon outlining the benefits of proposed opak fill F7 &F9 filters in comparison to the pre existing F7 filters in situ with respect to expected levels of increased filtration and clean pressure differential pressures anticipated by the manufacturer, as the clean DP of the F9 opak fills where very similar to that of the F7 bags, not detriment to plant capacity the selection of these filters was approved for installation to selected AHU plant. I believe these where installed the same day the plant was shut down to facilitate the filter frame bypass inspection conducted by myself and Ian Powrie in the presence of DR John Hood.

151. Dr Christine Peters tell us in her statement that you showed her round the plant rooms in the evening? Why did you do this tour in the evening? Were you instructed to give her a tour in the evening, if so, by whom?

A I was asked to show Dr Christine Peters the level 12 plantrooms by Ian Powrie who was also in attendance for the tour, I do not recall this being in the evening and there was no reason that I can recall that the time had to be specific other than this is when Ian Powrie had advised when it was arranged for, presumably to suit the attendance of all individuals.

a) What action, if any, was taken following this tour? Describe any involvement you had.

A I don't know what action was taken as part of this tour; it was my understanding that this tour formed part of the IPC investigative process.

b) In her statement Dr Christine Peters tells us that you were in possession of photos taken pre-clean up, but she did not know this at the time. Did you show these photos to Dr Christine Peters, if so, when? If not, Why not?

A I do not recall showing Dr Christine Peters any photos, all photographs/investigation information taken by myself, other estates colleagues and sub contractors was uploaded and collated onto a folder on the estates shared drive labelled level 12 plantroom investigation, the sharing and distribution of this information was at the discretion of my line managers

Colin Purdon and Ian Powrie on its completion, I was not authorised share this information and was collated for the purpose of the IMT and subsequent John Hood investigation.

c) In her statement Dr Teresa Inkster tells us that you provided an email with a map of the plant room layout with pigeon droppings marked in orange. Do you recall this map? Did you mark on the pigeon droppings in orange? Why did you do this?

A I do recall this layout drawing/map as this was a result of the survey I was asked to carry out previously by Ian Powrie. I highlighted the droppings in orange to make it visibly clear to any perspective reviewer where I had observed them within the plantroom layout drawing. I also signed and dated it.

d) Dr Teresa Inkster tells is in her statement:
'You would expect that when air handling units were opened by Estates that contamination would have occurred then. The reason the location of the pigeon droppings is significant is subsequently there was a suggestion that it had affected one of the plant rooms more than the others. That was not the case. It is very clear from Darryl Conner's markings that it was more extensive'

Do you agree with this comment? What concerns, if any, did you have about the level of pigeon droppings? In how many areas were there dropping? If you had concerns explain why and what the reason for your concerns was.

A I don't agree with this comment. To my knowledge thorough analysis of estates maintenance records carried out by John Hood during his investigation concluded that none of the AHUs that served the patient pathways and timescales of recorded infection where accessed for maintenance during the timescales recorded. Maintenance practices are carried out by " competent persons" who are trained to clean AHU chambers as they work from inside to outside of the AHU removing any debris and dust that may occur as a result of a filter replacement. My understanding from what

I learned during my involvement in the investigation is that bird droppings would have to be dry and be in significant quantities to atomise in the surrounding air. The AHUs on level 12 draw their primary air supply from outside external intake louvres directly into the pre filtration of the AHU, my understanding is this configuration is intended to protect from ingress of internal plantroom conditions. As the AHUs where not accessed for maintenance during the timescales outlined within John Hoods investigation, I would advise that the AHU plant sited at the QEUH are sealed closed units with the majority of the components being under significant positive pressure therefore the drawing in of any external contaminent is highly unlikely. Areas of the AHU that are under negative pressure are connect to the fresh air intakes at high level where no ingress was found to my knowledge.

e) In her statement Dr Teresa Inkster tells us that:
On 20 February 2020, an email was forwarded to me by Dr Hood from Darryl Conner containing yet more plant room images and again these had not been shared with either me or the IMT prior to this point. Dr Hood was concerned that Darryl would get into trouble for sending these but did not say from whom. These pictures included images of bird droppings on plant room floors and a dead bird on the floor.

i) Do you recall this email?

A I do recall this email, Dr John Hood requested these images for his investigation, I passed this request to my line manager Colin Purdon who confirmed it was okay for me to send them.

ii) Who took the images of the plant room?

A These images where a collation of images taken personally and by other estates colleagues, some photos were taken and provided by estates contractors, and uploaded onto the estates shared drive for record. I do not recall specifically who took what pictures, just that was what had been compiled.

iii) What did these images show?

A Bird droppings and images of a dead bird within the level 12 plantrooms.

iv) How would you describe the volume of bird droppings and dead birds contained within the imagines? What concerns, if any, did you have regarding this?

A Bird droppings where widespread and varied in volume with the largest quantity observed within the end of plantroom 123 (box highlighted on drawing) I recall a single dead bird from the images. My concerns where around where the breaches in the fabric may exist and how long had the pigeons had been getting into the plantroom that contributed the quantity of droppings. I recall the neutralisation and cleaning of this debris to be a high priority in order to bring this ingress under control.

v) Were you concerned that you would get in trouble for sending the images to Dr Hood? If so, explain why.

A No, this is why I sought permission from my line manager prior to sending them to him.

f) Discuss your involvement at the Cryptococcus Sub-Group Meetings - actions taken, internal escalation: HPS involvement.

A Please see A-152e

g) What, if any, external reporting occurred?

A The reporting and terms of reference for the group were managed by the group chair Dr John Hood.

h) PAGs/ IMTs/ AICC and BICC involvement.

A I attended IMTs in relation to the incident that are well documented within the meeting minutes.

i) What steps were taken in response/ precautions put in place?

A Please see A-152e

j) Did you read John Hood's report?

A No I had since left NHSGG&C and joined NHS Scotland Assure before his report was completed and released. I do recall Tom Steel Director of Estates and facilities for GG&C emailed me a copy not long after I commenced my new role with NHSSA however did not get the chance to read it due to new ongoing work commitments.

k) When did you read John Hood's report?

A Please see Answer -j

l) What observations, if any, did you make after reading John Hood's report? What actions were taken following the John Hood report?

A Please see Answer-j

m) What else could have been done? How could matters have been handled differently? What concerns, if any, did you have about how matters were dealt with?

A In my experience, I found the investigation and resultant actions to be carried out with the up most effort and respect by all stakeholders in support of the investigation.

n) What involvement, if any, did you have in the investigations?

A I assisted John Hood by providing him, with system service schedules, PPM information, system schematics and layout as fitted information. I escorted him to areas of the site where he wished to visit and gain an understanding through measurement of preexisting pressure cascades between adjoining areas. I reported at regular meetings chaired by John Hood on the progress of estates actions agreed and issued by the group.

Risk Assessments ward 4C

152. We understand that in 2020 Risk Assessments were carried out in respect of Ward 4C in order to actively assess the 'risk associated with the exposure to airborne pathogens from ventilation systems, for immune compromised patients'. You were involved in this risk assessment.

a) Describe your involvement, if any, in the risk assessment carried out in 2020?

A I don't recall being involved in the risk assessment to actively assess the 'risk associated with the exposure to airborne pathogens from ventilation systems, for immune compromised patients', I do remember having the ward surveyed for Air change rates and associated pressure cascades. I also recall preparing a Ward 4c option appraisal paper for Alan Gallacher and Tom Steele to be reviewed and potentially used as part of this risk assessment by others, outlining the options I believed where available to achieve ventilation compliance or strategy improvements to support this patient cohort within the live build environment.

b) What action, if any, was taken following the risk assessment in 2020?

A I recall an option was selected that included risk reducing improvement works for ward 4C that where subsequently carried out by operational estates. Some of the improvements made where very identical to the previous improvements carried out for ward 6A, such as corridor Ceiling vent grill removal for normal ceiling tiles. Installation of patient room en suite ceiling void HEPA scrubbers. Patient room IPS panel inspections, room fabric inspection and repairs. Source AHU filtration increases from F7 to F9 opakfill, confirmation and necessary steps to ensure all patient rooms where notionally positive to corridor etc.

c) How were any matters escalated, either internally or externally? Explain your answer.

A I reported all work progress to Alan Gallager Head of Estates.

d) Why were risk assessments for Ward 4C not carried out prior to 2020?

A I don't know why.

e) Why did you start carrying out risk assessments of Ward 4C in 2020?

A Please see A160a

f) What prompted the risk assessment of Ward 4C in 2020?

A This would be for IPC to advise.

153. We understand that in 2021 Risk Assessments were carried out in respect of Ward 4C in order to actively assess the 'risk associated with the exposure to airborne pathogens from ventilation systems, for immune compromised patients'.

a) Describe your involvement in the risk assessment carried out in 2021?

A Please see A160a

b) What action did you take, if any, following the risk assessment in 2021?

A Please see A160a

c) How were any matters escalated, either internally or externally? Explain your answer.

A Please see A160a

d) Why was the risk assessed as medium? What criteria merited this assessment? To what extent has your view of the risk assessment changed if at all, since 2021?

A This would be for the IPC and clinical teams to advise.

e) What further action, if any, should have been taken?

A Please see A160a

f) What potential adverse risk to patients arose, if any, due to failure to take further action?

A I am not qualified to quantify these risks, this would be for the clinical and IPC teams to confirm.

154. What risk assessments were carried out in respect of Ward 6A and Ward 4B? In your answer consider the following:

(1) When did these risk assessments begin?

(2) What were the risk assessments in respect of?

(3) What action was taken following any risk assessments carried out?

(4) What further action, if any, could have been taken?

(5) If no risk assessments were carried out, why? How would this have impacted patient safety?

A I was not part of these risk assessments; my role was to provide my line management with ventilation strategy and maintenance overview and option appraisals to assist stakeholders in their assessment.

155. We are aware of upgrade works being carried out in respect of Ward 2A at RHC. Do both adult and paediatric patients have a similar profile of infection risk? Why were upgrade works not carried out for the adult hospital Ward 4C?

A I am not qualified to answer this question about patient infection profile this would be for clinical and IPC teams to advise. Ward 4C did receive some upgrade works but not to the same level of refurbishment as Ward 2A.

156. To what extent did the upgrade works carried out to Ward 2A result in a higher level of protection to patients from risk of infection, than that offered in Ward 4C, both at the time and now? Explain you answer:

A I believe the design intent for the ward 2A upgrade works was to comply with the guidance standards recommended within SHTM-03-01 (A) & SHPN-04-01 (Sup1) for a neutropenic patient group inclusive of complete AHU plant replacement and significant fabric modifications. Ward 4C received

modifications previously described to improve the environment within the as built parameters of the ward.

157. Why did the adult patients not receive the same level of protection from infection as paediatric patients?

A I don't know.

158. How did the use of chilled beams impact patient protection from infection in Ward 4C?

A This would be for IPC to quantify; I can advise from an estates perspective that chilled beams have limited flow rates and can impact on the level of ACH rates to the space served by them.

159. To what extent did the use of chilled beams in Ward 4C contribute, if at all, to higher levels of infection in patients?

A IPC to advise.

160. To what extent did the lack of HEPA filtration impact patient protection from infection in Ward 4C? If so, how so? If not, why not?

A IPC to advise.

161. To what extent did the lack of HEPA filtration in Ward 4C contribute, if at all, to higher levels of infection in patients?

A IPC to advise.

162. To what extent did the lack of air permeability impact patient protection from infection in Ward 4C?If so, how so? If not, why not?

A This is difficult to quantify as the rooms within this ward are not dedicated Isolation rooms with the commissioned and validated air flow rates to support a ventilation strategy that would require the measured permeability to achieve the standard of a neutropenic ventilation strategy. IPC probably better to respond to this question.

163. To what extent did the lack of air permeability in Ward 4C contribute, if at all, to higher levels of infection in patients?

A IPC to advise.

164. To what extent did the negative room air pressure impact patient protection from infection in Ward 4C?

A IPC to advise.

165. To what extent did negative room air pressure in Ward 4C contribute, if at all,to higher levels of infection in patients?

A IPC to advise.

166. How did the non-compliance with SHTM in relation to air chances per hour in Ward 4C impact patient protection from infection in Ward 4C?

A IPC to advise.

167. To what extent did the non-compliance with SHTM in respect of air changes per hour in ward 4C contribute, if at all, to increased levels of infections in patients?

A IPC to advise.

168. To what extent did non-compliance with SHTM in relation to room air a pressure in Ward 4C impact patient protection from infection in Ward 4C? If so, how so? If not, why not?

A IPC to advise.

169. How did any non-compliance with SHTM in respect of room air pressure in Ward 4C contribute, if at all, to increased levels of infections in patients?

A IPC to advise.

170. What action has been taken to improve on risks associated with airborne pathogens to patients in Ward 4C following the risk assessments from 2020 and 2021?

A I have described the ward Improvements carried out to my knowledge at that time in my answer to Q1c

171. To what extent, if any, has Ward 4C been non-compliant in respect of SHTM ventilation requirements since the opening of QEUH/RHC in 2015? Explain your answer.

A To my knowledge Ward 4C was commissioned to the standard of a general ward, which is advised under guidance STM-03-01 to achieve 6 air changes per hour, requested surveys around this period indicated the measured ACH rates where less than this approximately 2.5-3 AChs per hour.

172. Why has no further action been taken to upgrade Ward 4C in order to achieve SHTM compliance?

A I don't know.

173. What else do you wish to add in respect of the risk assessments of Ward 4C in 2020 and 2021 that you feel could be of assistance to the Inquiry?

A Nothing at this time.

<u>Staffing and working environment</u>

174. What were the staffing levels like in estates at the point of handover? Where did the staff come from – were they mainly transferred from old site?

A At the point of handover staffing levels where not complete to my recollection as new operatives were still arriving to start from other hospitals that were pending closure and decommissioning. To my knowledge staff where recruited from other sites through application and interview prior to handover like myself, while others operatives where redeployed on closure of their resident hospital sites.

175. Concerns if any about staffing following handover – to what extent did the staffing levels manage the workload? Refer to Bundle 8, document 40.

A I was not in a position as Estates Duty Manager to make this assessment and at this point in time the size of the workload was not clear to me.

176. Was appropriate training in place for new and existing staff on using new systems and working within the QEUH? How did you ensure that new and current staff were appropriately trained? Refer to Estates Communication Bundle, document 5 - what was this and what was the training like? How did this assist you and staff with working at QEUH – was it equipment focus, asset focused please describe.

A Please see Answer 38 b & e

177. Did you consider the training to be sufficient?

A

178. Who was responsible for providing staffing? Who was responsible for ensuring staffing was maintained at sufficient levels?

A It was my understanding that Ian Powrie requested and confirmed the original staffing compliment, from that point onwards staffing maintenance was managed through internal management process, for example a supervisor would recruit and interview a technician, an Estates manager would recruit and interview a supervisor, a site manager would recruit and interview an estates manager etc.

179. What concerns did you have regarding staffing levels?

A I felt we didn't have enough staff to account for sickness and annual leave on the shift teams, these were crews of 5 shift teams to cover emergency response and out of hours ppm for the entire campus out of hours which was easily impacted by absence.

180. What was the working environment like when QEUH opened – work life balance/ workplace culture? What issues, if any, did you have? If so, what concerns did you raise? Who did you raise these concerns with?

A When the QEUH opened it was a very busy period, long hours, lots of changing and competing priorities and everyone finding their feet. It was an exciting period due to the sheer size and expectation of the facility and presented to me personally a significant opportunity to learn and develop my skill sets and experience.

181. Who was on site to manage and assist with carrying out works relating to equipment? How did this assist your workload in estates? To what extent, if any, was there a reliance on commercial third parties such as Multiplex when it came to staffing levels?

A My understanding was staffing levels were not related to contractors on site to fufill the estates compliment but were utilised to assist and support post handover workloads and the influx of new departments occupying areas and their requests. As service contracts were still being established for various systems contractors were procured on a need-to-need basis to support the ongoing priority of works as and when required depending on discipline, specialisim and resource. Brookfield Multiplex and their sub contractor Mercury were still on site carrying out snagging and defect works and were contactable for sign posting of information should it be required.

182. Generally – discuss the workplace environment and culture – What concerns, if any, did you have?

A I found the workplace environment and culture to be a positive experience, the majority of people I encountered were motivated and appreciated they were involved in a exciting new facility that presented a challenge. The only concern I recall having was AP & Cp discipline training and appointments were on going rather than in place prior to handover and that it would take time and site experience for everyone to get their bearings of the geography

of the hospital and understanding and awareness of the systems within them before our estates service was truly effective.

183. Describe the handover process? What concerns, if any, did you have in the run up to handover? How successful was the handover?

A I was not involved in the handover process; this was the responsibility of the project team.

184. GGC took handover from Multiplex earlier than initially contracted for – what did you think about this? Why did it happen? What was the rationale for the early handover?

A I don't know why this happened.

185. Were the concerns raised by infection control colleagues regarding the general build of QEUH/RHC taken seriously? What action did you take in response to these concerns, not already mentioned in your answers? Refer to Estates Communication bundle documents 100 and 116 in considering your answer.

A I was not aware of the concerns raised by the Infection Control team about the general build these concerns would have been communicated to senior personnel of the estates and facilities team.

186. Is there anything further that you want to add that you feel could be of assistance to the Inquiry?

A No.

Declaration

187. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

188. The witness was provided the following Scottish Hospital Inquiry Bundles / documents for reference when they completed their questionnaire statement (Appendix A).

Appendix A

A48807918 – Bundle 1 – Incident Management Team Meeting Minutes (IMT Minutes)
A43273121 – Bundle 3 - NHS National Services Scotland: SBAR Documentation
A43293438 – Bundle 6 – Miscellaneous Documents
A48806285 – Bundle 8 – Supplementary Documents for the Oral Hearing commencing on 12 June
A48808157 – Bundle 9 – QEUH Cryptococcus Sub-group Minutes
A48807604 – Bundle 12 – Estates Communications
A49267796 - NHS - Karen Connelly - Feral Pigeon Infestation - QEUH - 08012019