CloudHQ / ELEPHANT

FRA1/GER1 for CC1&CC2

Commissioning Plan

Version 2.0

23rd January 2023

Contents

1. Introduction

The purpose of the commissioning (Cx) plan is to provide a plan and structure for the commissioning process. This Cx plan has been produced for use at the CloudHQ Frankfurt project and incorporates the procured commissioning and acceptance testing requirements. The Cx plan is a living document that will be continuously updated throughout all levels of commissioning. This document is issued to ELEPHANT for comment and feedback so we can consider the requirements of ELEPHANT and incorporate or comment.

The Cx plan should be read in conjunction with the project approved design documents. Please refer to the "Advanced Design Information" pack for agreed design between GX DCE teams and CloudHQ.

BVPI (Bureau Veritas Primary Integration) have been appointed as the 3rd Party Independent Commissioning Agent on the project. This Cx Plan gives a guideline for the execution of the electrical and mechanical system and equipment commissioning process. The purpose of testing the mechanical and electrical systems and equipment under a commissioning program is to ensure equipment has been constructed, installed, and operates correctly per design intent while also demonstrating that the operation of the datacenter will not be compromised during normal or adverse operating conditions. Ultimately, these tests will ensure the data center performs in accordance with client requirements and provides a reliable environment for the client's critical load.

The commissioning plan provides an outline of the project and how the commissioning process should be managed to ensure alignment with the clients commissioning requirements and specifications. The commissioning plan outlines the various stakeholder input and responsibilities throughout the project.

2. Project Description

When fully complete the proposed data centre design will comprise 17,884 m² of Data Hall comprising 8 Data Halls on the ground floor and 10 Data Halls on the first floor. In addition to this, there are the associated internal plant rooms together with an office building.

There will also be an external gantry for the cooling plant. The Generator sets will be externally placed to the West and East of the FRA086 building.
The data centre will comprise of 5 separate computer centres each with an IT load of 11.2 MW, with the fully equipped FRA086 building having an IT load of 56MW when fully fitted out. For this initial phase of the project and lease agreement we will be building CC1 & CC2 (22.4 MW).

The works for this phase of the project will include, but not be restricted to:

<u>Ground Floor</u>

- Formation and fitting out of 2no Computer Centres each comprised of 4 Data Halls including associated cooling galleries and access corridors.
- Data Hall 1 (998 m²) - support up to 2.8kW/m² and an IT load of 2800kW
- Data Hall 2 (998 m²) - support up to 2.8kW/m2 and an IT load of 2800kW

- Data Hall 3 (998 m²) - support up to 2.8kW/m2 and an IT load of 2800kW
- Data Hall 4 (998 m²) - support up to 2.8kW/m2 and an IT load of 2800kW
- Data Hall 5 (998 m²) - support up to 2.8kW/m2 and an IT load of 2800kW
- Data Hall 6 (998 m²) - support up to 2.8kW/m2 and an IT load of 2800kW
- Data Hall 7 (632 m²) - support up to 4.5kW/m2 and an IT load of 2800kW
- Data Hall 8 (632 m²) - support up to 4.5kW/m2 and an IT load of 2800kW
- Installation of 2No MMR rooms
- Installation of 3No Fibre intake rooms
- Installation of 3No. freight lifts and 1No. Passenger lift
- Installation of associated plant rooms, office and ancillary areas, storage areas etc

First Floor (no Data Halls delivered on First Floor [FF] as part of this lease / construction contract).

- Offices, meeting rooms and welfare areas – in the office building

3. Reference Documentation

This document defines draft Project testing and commissioning levels, roles and responsibilities, deliverables, test procedure and test criteria examples. All Cx and testing activities shall generally comply with Commissioning Requirements and local Electrical, Mechanical, building authorities having jurisdiction and the following international organizations where applicable.

- ASHRAE – American society of Heating, refrigeration and Airconditioning Engineers
- DIN EN – Building service guidelines
- DIN VDE 0100 – LV regulations – IEC 60364

Additional reference documents for this project are as follows:

- CHQ_QC Program Standards
- Cloud CX standards
- CHQ - Commissioning of Mechanical Systems
- CHQ - Commissioning of Electrical Systems
- Elephant – Schedule C

4. Acronyms and Abbreviations

The following are common acronyms used in this document: (also refer to the commissioning plan of record; standards for definitions of acronyms)

Table 2. Definitions of Common Acronyms and Abbreviations:

Acronyms	***Definition***
B&W	*Black and White Engineering (CloudHQ original designer)*
Cx	*Commissioning*
BYES CXA	*Commissioning Agent (Bouygues)*
CHQ CXA	*CloudHQ / ELEPHANT Commissioning Agent*
BYES	*General Contractor*
CC	*Commissioning Consultants*
BYES/CM	*General Contractor / Commissioning manager*
QA/QC	*Quality Assurance / Quality control*

Acronyms	Definition
Site Op's	*Client site operation engineers*
IRL	*Issue Resolution Log*
FM	*Facility Management*
CxPoR	*Commissioning procedures document. This is the document that outlines the primary goals, requirements, and preferences for Client project. It is used throughout the project as a benchmark as to whether the project is meeting CxPoR expectations.*
Contract Document	*The documents governing the responsibilities and relationships between parties involved in the design and construction of this project including (but not necessarily limited to):* *Agreements/contracts.* *Design/ Construction plans and drawings.* *Specifications.* *Change Orders.*
SP	*Cx Alloy online documentation system for commissioning (as approved by Cloud)*
[TBC]	*Manageable snagging collaboration tool*
FWT	*Factory Witness Testing. – as Level 1*
SAI	*Site Acceptance Inspection – Level 2 – Dead testing and pre-energisation vendor check list*
PFT	*Pre-Functional Testing referred to as level 3 testing. This is the testing carried out by the supplier/ vendor/ manufacturer and/ or BYES*
Cx Level 4	*Functional Performance Testing. – Level 4 Full system Functional Performance Testing.*
Integrated Systems Testing (IST)	*This is also referred to as Cx Level 5. This is process of expanding the functional testing from a system focus to a focus on how systems interact and how they affect each other. This testing follows the completion of all related zones and systems. The delivery of IST / Level 5 will amongst other lease obligations trigger Substantial Completion".*
BMS	Building Monitoring System
BoD	Basis of Design
BVPI	Bureau Veritas Primary Integration
Cx	Commissioning Process

Acronyms	Definition
CT	Current Transformer
CxA	Commissioning Authority/Agent (BVPI)
CRAC	Computer Room Air Cooler
CRAH	Computer Room Air Handler
DCR	Daily Commissioning Report
DoO	Description of Operation
EPMS	Electrical Power Monitoring System
FAT	Factory Acceptance Test
FPT	Functional Performance Test
HVAC	Heating Ventilation & Air Conditioning
SAT	Site Acceptance Test
FPT	Functional Performance Test
HLT	Heat Load Test
IRL	Issue Resolution Log
IST	IST – Integrated Systems Test
ITIC/CBEMA	Information Technology Industry Council/ Computer Business Equipment Manufacturers Association
LV	Low Voltage
MV	Medium Voltage
MC	Main Contractor
PQM	Power Quality Meter
QA/QC	Quality Assurance/ Quality Control
RFSU	Ready for Start-Up
RMU	Ring Main Unit
SoO	Sequence of Operation
TAB	Test & Balance (Air & Water)
UPS	Uninterruptible Power Supply

5. Commissioning Plan Objectives

Commissioning is a quality and handover process which provides documented confirmation of proper installation and function of a facility's systems and components as designed and specified.

Commissioning ensures the facility meets the Owners and Tenants project requirements, the Basis of Design and operational needs of the intended usage. Commissioning process shall include the following:
To ensure building systems perform interactively according to Data Centre project requirements, basis of Design and the Commissioning Plan of Record. The specific objectives include but not limited to the following:

- Verify that no mechanical and electrical coordination and design issues are present, as well as identify any Single Points of Failures (SPoFs), through a careful review of the construction drawings, specifications, and submittals.

- Ensure that applicable equipment and systems are installed properly and receive adequate quality checkout through careful site observation and verification of BYES quality control documentation.

- The purpose of commissioning is to provide CloudHQ and the Tenant with a high level of assurance that the building systems are installed and operating in the appropriate manner, and is in compliance with the design intent, contract documents and Commissioning Plan of Record.

- This process is not to diminish the responsibility of the system designers or installing contractors, nor is it intended to be a redundant testing or inspection function. Commissioning is performed to document and validate the efforts of the designers and contractors, ensuring that the quality of the systems meets the Owners and Tenants project requirements as documented by the basis of design and "Advanced Design Information" as agreed within the lease.

- A major component of the commissioning process is the Integrated Systems Test, or IST. This phase of commissioning is intended to verify that the emergency and redundant systems, which are interrelated in complex manners, will perform appropriately when called upon. The IST will be conducted after all factory and field component/system quality control, start-up, and test procedures have been completed. The goal of this testing is to verify the operation, interdependencies, redundancies, and fail-safe operation of all critical systems. The IST shall amongst other lease conditions act as the handover or trigger for Substantial Completion.

- Verify and document the mechanical and electrical systems function and interact as intended. This will be accomplished through witnessing and documenting an Integrated Systems Test. The IST will be developed and administered by the Commissioning Authority (CHQ CXA) and performed by the subcontractors and/or vendors, led and managed by BYES.

- Deliver a comprehensive systems manual to the owner. This electronic manual will provide the owner with a searchable reference of all as-built drawings, specifications, O&M manuals, final commissioning reports, and other important documentation.

- Commissioning Meetings - The agreed CXA shall setup a kick-off meeting and hold regular meetings throughout the project. Meeting will be conducted locally and via live meeting and times shall be coordinated with the required parties.

- ELEPHANT will be given the opportunity to contribute towards all testing scripts though CloudHQ. CloudHQ and Bouygues will work to provide these scripts as soon as possible and to agreed deadlines so that that ELEPHANT can contribute.

- ELEPHANT will be given opportunity to attend all witnessing and site testing, including IST.

6. Management Strategy

Management Strategy – Responsibility Matrix		
Phase	Manage Task	Support Task
Level 0 – Design Reviews & Cx Plan	BVPI	Bouygues/ Cloud HQ
Level 1 – FAT/FWT & Equipment Delivery (Red Tag)	Bouygues	BVPI / Cloud HQ
Level 2 – QA/QC (Yellow Tag)	Bouygues	Contractors/Vendors & BVPI – Periodic Inspections
Level 3 – Start-Ups (Green Tag)	Bouygues	Contractors/Vendors & BVPI – Periodic Inspections
Level 4 FPT (Blue Tag)	BVPI	Bouygues/Vendors/Contractors
Level 5 – IST (White Tag)	BVPI	Bouygues/Vendors/Contractors
Level 0 – 3 Meetings (Design/Progress)	Bouygues	Contractors/Vendors & BVPI As Required
Level 4 & 5 Meetings	BVPI	Bouygues/Contractors/Cloud HQ
Cx Tagging L1-L3	Bouygues	Bouygues
Cx Tagging L4-L5	BVPI	Bouygues
O&M Production	Bouygues / Vendor	BVPI / Cloud HQ / Design Consultant
Training Plan	Bouygues	Design Consultant / BVPI / Cloud HQ
Standard Operating and Emergency Procedures	Bouygues / Vendor	Design Consultant / BVPI / Cloud HQ
L1-L3 Test Script Development	Bouygues / Vendor	Design Consultant / BVPI / Cloud HQ
L4-L5 Test Script Development	BVPI	Cloud HQ / Design Consultant
Weekly Cx Meetings	BVPI	Cloud HQ/GC/Contactors/Vendors
Customer Meetings	Cloud HQ	BVPI

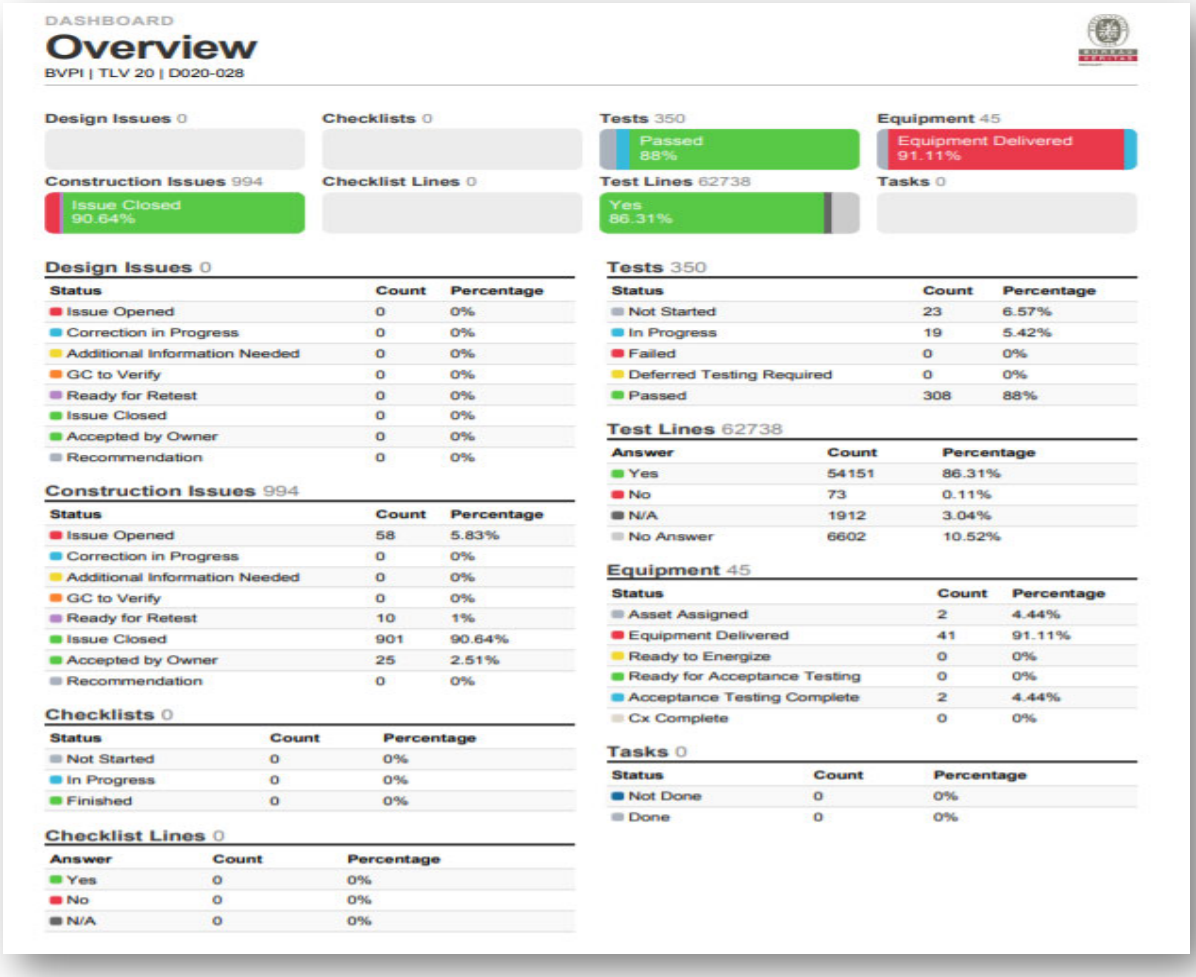
7. Cx Alloy

Cx Alloy will be the Cx execution platform for commissioning levels 1 to 5. Cx Alloy as a commissioning tool can be accessed via web-based platform or iOS application. As an application it can operate in both offline and online mode, for offline mode it has a synchronization feature which ensures no data is lost whilst using the application offline.

Platform will be set up by BVPI and shall be utilised by all contractors. Please see Tag checklist in an Annex 3 of this document. BVPI will utilize Cx Alloy for execution of the levels 4 and 5 test scripts.

Bouygues will use Cx Alloy for Commissioning levels 1, 2 and 3. All relevant supporting commissioning documents (e.g., measurement reports, vendor commissioning documentation) will be uploaded to Cx Alloy and linked to the assorted assets. The workflow detailing the collaboration with the CxA is detailed in section 7.1.

Cx Alloy will be utilised by contractors / vendors / client to track any commissioning issues raised. Access to this platform will be arranged for contractors, and vendors and they will be able to view all issues raised and change the status ahead of BVPI verification. These issues can be exported in excel or pdf should it be required. The issue workflows are detailed in sections 6.2 & 6.3 below.



DASHBOARD

Overview

BVPI | TLV 20 | D020-028

Design Issues 0

Checklists 0

Tests 350 — Passed 88%

Equipment 45 — Equipment Delivered 91.11%

Construction Issues 994 — Issue Closed 90.64%

Checklist Lines 0

Test Lines 62738 — Yes 86.31%

Tasks 0

Design Issues 0

Status	Count	Percentage
Issue Opened	0	0%
Correction in Progress	0	0%
Additional Information Needed	0	0%
GC to Verify	0	0%
Ready for Retest	0	0%
Issue Closed	0	0%
Accepted by Owner	0	0%
Recommendation	0	0%

Construction Issues 994

Status	Count	Percentage
Issue Opened	58	5.83%
Correction in Progress	0	0%
Additional Information Needed	0	0%
GC to Verify	0	0%
Ready for Retest	10	1%
Issue Closed	901	90.64%
Accepted by Owner	25	2.51%
Recommendation	0	0%

Checklists 0

Status	Count	Percentage
Not Started	0	0%
In Progress	0	0%
Finished	0	0%

Checklist Lines 0

Answer	Count	Percentage
Yes	0	0%
No	0	0%
N/A	0	0%

Tests 350

Status	Count	Percentage
Not Started	23	6.57%
In Progress	19	5.42%
Failed	0	0%
Deferred Testing Required	0	0%
Passed	308	88%

Test Lines 62738

Answer	Count	Percentage
Yes	54151	86.31%
No	73	0.11%
N/A	1912	3.04%
No Answer	6602	10.52%

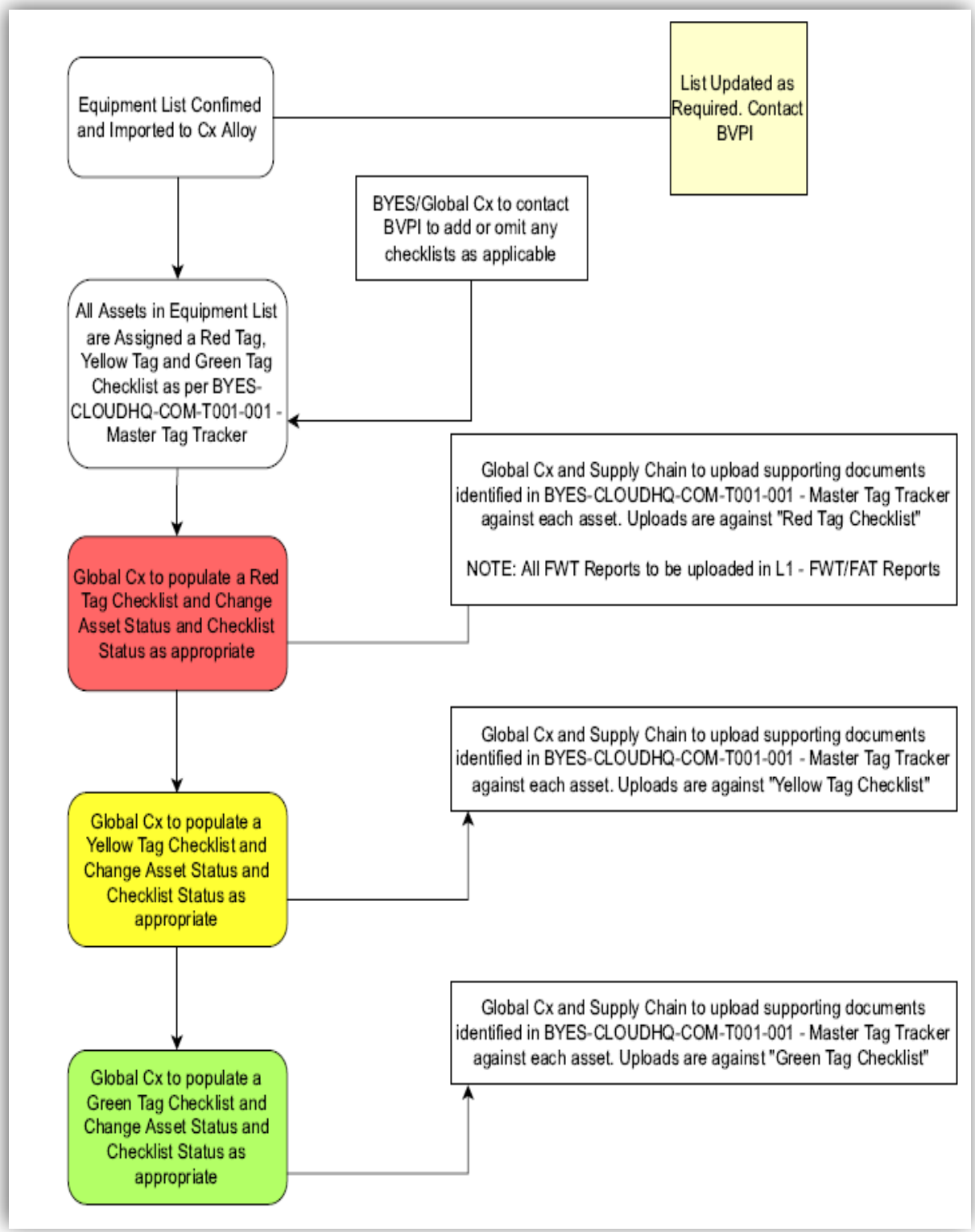
Equipment 45

Status	Count	Percentage
Asset Assigned	2	4.44%
Equipment Delivered	41	91.11%
Ready to Energize	0	0%
Ready for Acceptance Testing	0	0%
Acceptance Testing Complete	2	4.44%
Cx Complete	0	0%

Tasks 0

Status	Count	Percentage
Not Done	0	0%
Done	0	0%

7.1. Workflow Process L1-L3



8. Issue Resolution Log

CxAlloy shall be utilised to capture and maintain the issues log for levels 0 – 6, The main contractor BYES, contractors and vendors will be provided suitable access. Issues will be identified and tracked as they are encountered, documenting the status of unresolved and resolved issues.

BYES, Contractors & Vendors are responsible for raising and tracking to closure, any issues during levels 1, 2 & 3 Commissioning stages. BVPI will also add issues as required but will be tracked to closure by BYES throughout this commissioning stage.

BVPI will be responsible for raising/uploading any issues raised during Level 4 & 5 commissioning stages. The vendors and MC in liaison with BVPI are expected to resolve these issues and once a satisfactory solution is implemented BVPI will close the issues.

The following points will be included in each issue raised to ensure as much information as possible is recorded:

- Assign a descriptive title of the issue.
- Include photographs of the issue where possible.
- Identify number of the test being performed at the time of observation for cross-reference.
- Identify system, subsystem, and equipment to which the issue applies.
- Identify location of system, subsystem, and equipment.
- Include information that may be helpful in diagnosing or evaluating the issue.
- Note recommended corrective action.
- Identify commissioning team member responsible for correction action.

Once an issue is fixed it should include the following information as a minimum:

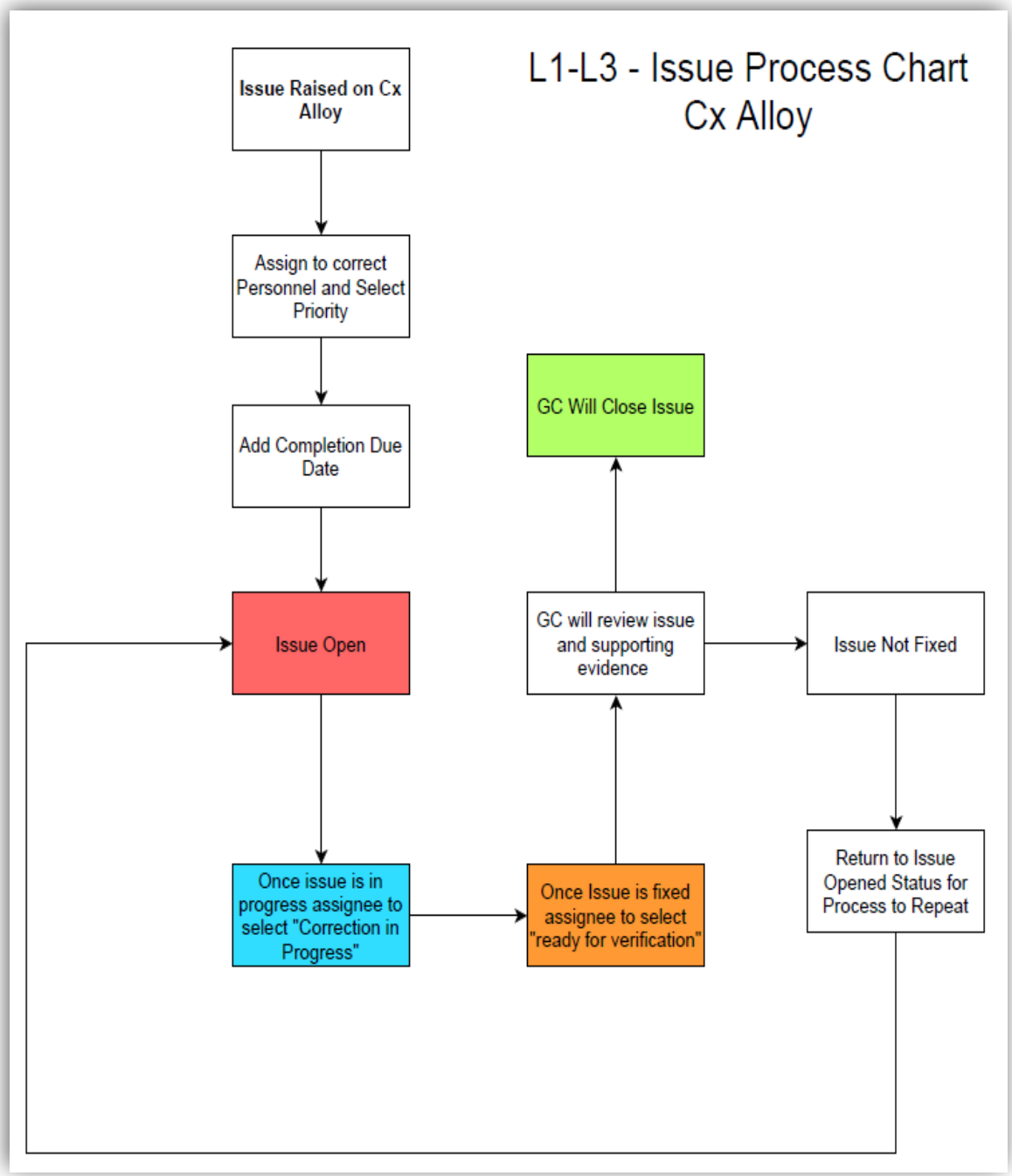
- Include a description of the diagnostic steps taken to determine the root cause of the issue.
- Identify changes to the Contract Documents that may require action.
- State that the correction was completed, and the system, subsystem, and equipment is ready for retest, if applicable.
- Attach photograph of fix implemented, if possible.
- Identify person(s) who corrected or resolved the issue.

Note: Once an issue is marked "ready for verification" (or similar) by the vendors/ contractors it should be verified by BYES who will then move the issue to the next stage "BYES Verified" ahead of BVPI validation and closure. BVPI will then decide whether it can be closed based on the works completed.

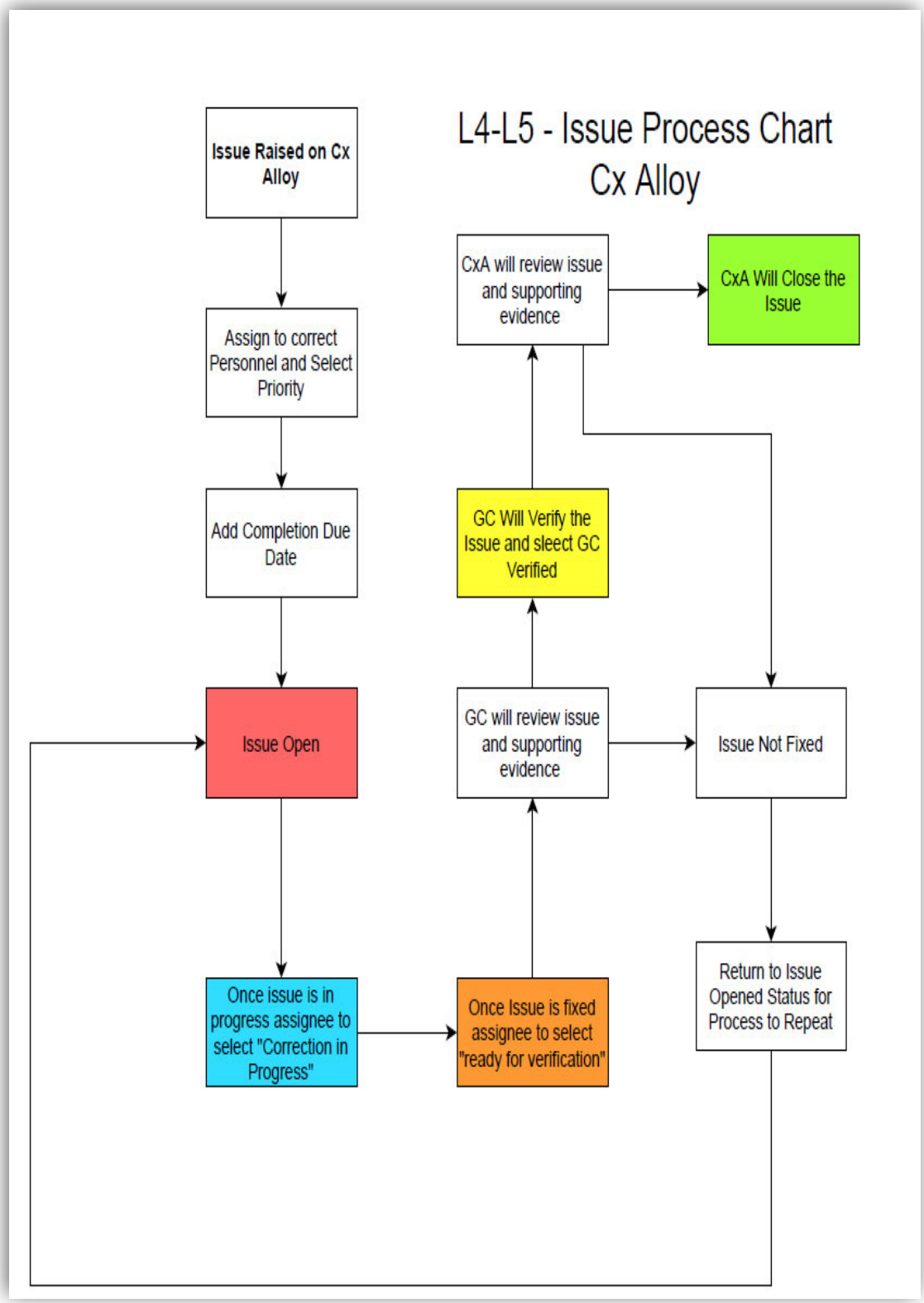
Please note that all issues will be categorized as follows:

- Priority 1 - Critical / Progress Limiting
- Priority 2 - Retest Required by CxA
- Priority 3 - No Retest Required

8.1. Issue workflow L1-L3



8.2. Issue Workflow L4-L5



9. Handover to Commissioning "H2C"

The "Handover to Commissioning" (H2C) which is sometimes referred to as Green Tag Hanover (GTH) is a very important step as it signifies the handoff between the Construction Phase and the Acceptance Phase. The systems been commissioned are completed and the equipment has been properly started up, all inspections and tests are completed, all issues are resolved and closed out and all inspections, tests, startup forms and documentation are filled out, completed and uploaded to relevant Cx Alloy.

All settings and parameters have been checked and verified. CxA involved for periodic inspections throughout L2 and L3 process. All monitoring systems are complete allowing the CxA to complete functional tests end to end. No changes shall be made to the monitoring systems, their software, and graphics, otherwise, the previous commissioning maybe be voided. Where changes are required, a meeting must be conducted with CxA to explain in detail the changes to enable to CxA to determine if any additional tests or checks are required.

Pre – Requisite Tracker to be enforced to ensure a smooth transition between L3 and L4 Cx. Some pre-requisites include items such as below:

- ✓ Level 3 commissioning successfully passed without deficiencies
- ✓ All systems configured fully automatic and enabled with all alarms/enunciations active.
- ✓ Load banks in place and operational to test the full load capability to 100% of the installed equipment and the supporting infrastructure
- ✓ The safety facilities and procedures are in place.
- ✓ Contractor and Vendor Support available
- ✓ Monitoring Systems Alarm free. (Open alarms to be reviewed and discussed in separate meeting if required). Justifications documented on all Open Alarms
- ✓ An approved monitoring points list is issued to the CxA
- ✓ L3 Documentation closed and available
- ✓ L4 Test Scripts approved and ready for execution
- ✓ IRL up to date and no major issues open that can cause impact to L4 Activities. Must be reviewed and agreed by CxA

9.1. Post H2C Responsibility

General Contractor (GC)

- ❖ Load banks - installation, movement, repairs, removal and fire watch.
- ❖ LOTO and Electrical switching support.
- ❖ Supply, install and remove construction power in support of load banks, test equipment etc.
- ❖ Supply internet connectivity in support of L4 Tests
- ❖ Coordination of Vendors and Subcontractors in support of Issue resolution.

Equipment Supplier / Vendor

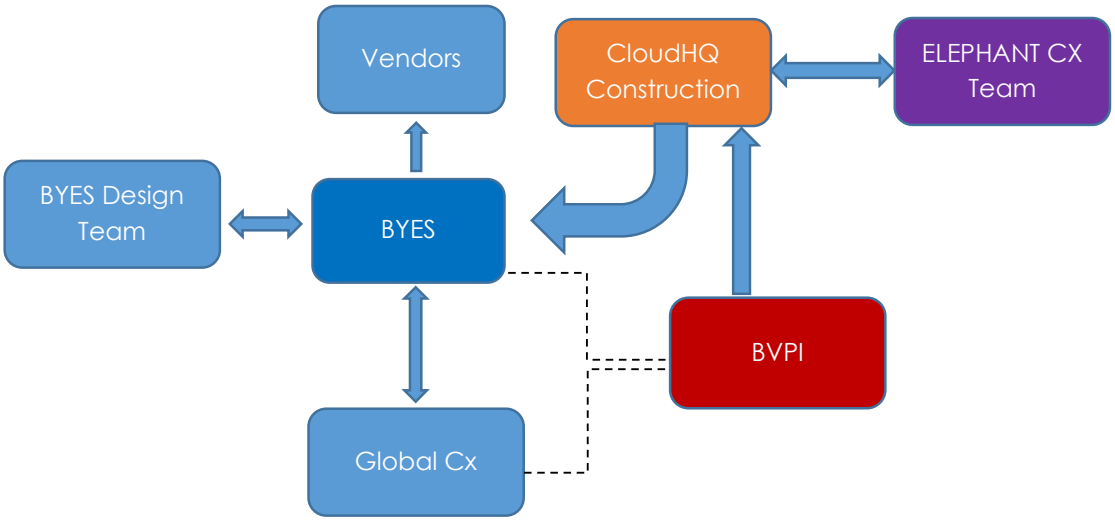
- ❖ Operation of equipment (as needed) to support testing.
- ❖ Equipment inspection support.
- ❖ Support as required for Issue resolution.

Controls Vendors

- ❖ Support testing by providing access to controls system monitoring (to include providing access to the Control Systems).
- ❖ Provide CxA training where required on the monitoring system prior to start of L4.
- ❖ Support Testing with trending and screenshots from the controls system.
- ❖ Support as required for Issue resolution.

10. Commissioning Overview and Deliverables

10.1. Project Org Chart

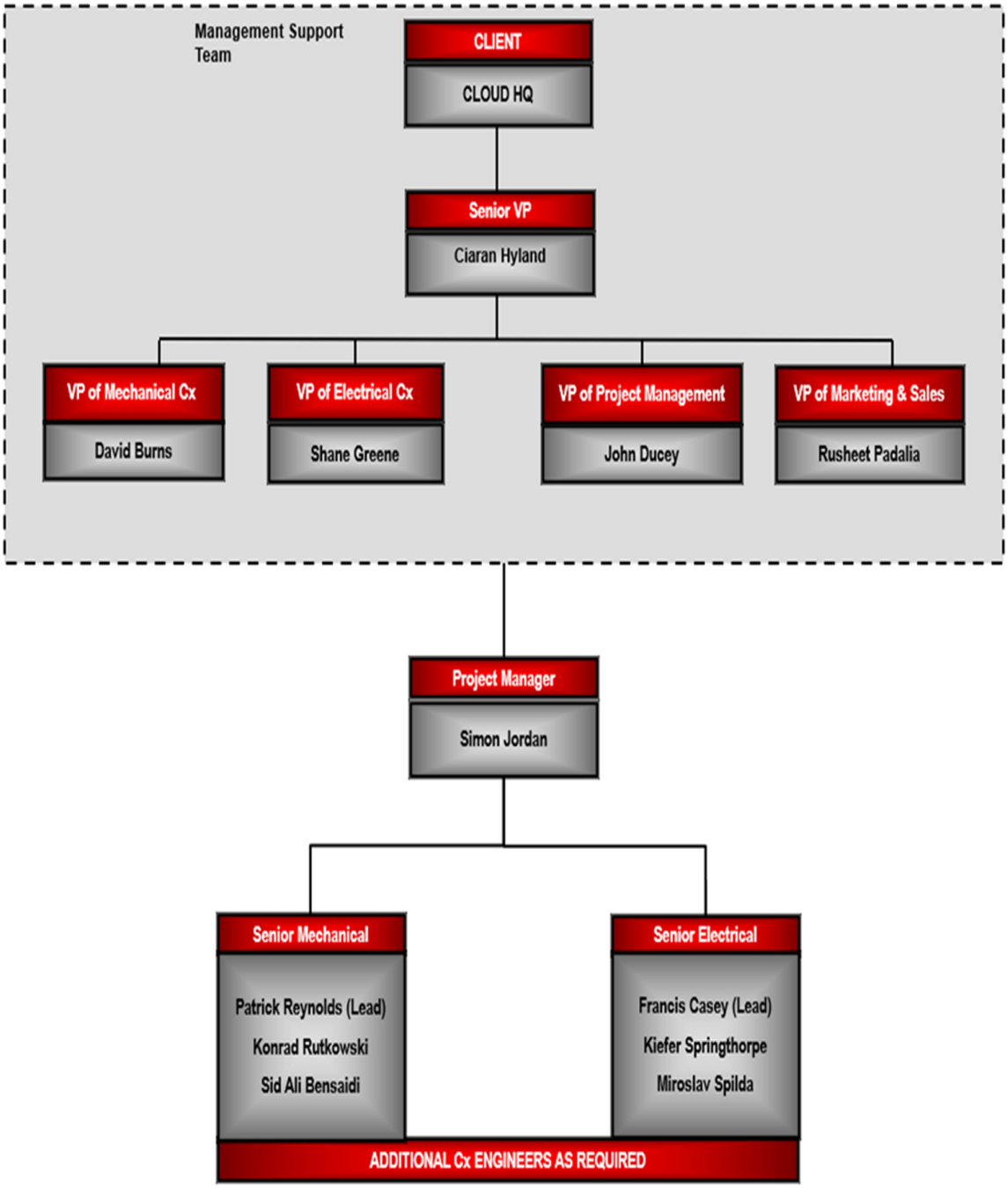


Stakeholders-Cx Activities	Company
Client	Cloud HQ
BYES	Bouygues
Bouygues' Cx Agent (for L1-3)	Global Commissioning
Cx Agent (for L4-5)	BVPI

10.2. Commissoning Equipment

The approved CC1 equipment list is found in Annex 2 of this document. Assets of upcoming construction phases will be added as they are available.

10.3. CxA Org Chart



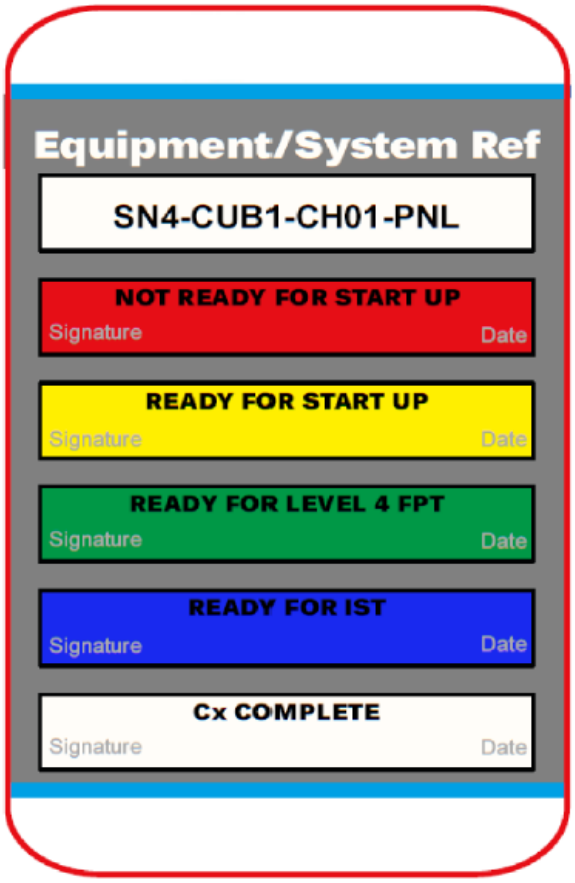
10.4. Project Cx Levels 1-5 Summary

Cx Level	Tag Colour	Responsible	Accountable
Level 1 - Manufacturer's testing completed and or FAT completed, and equipment delivered to site with correct documentation. Equipment Installation meets the requirements of the drawings and specifications without testing. ***Red Tag indicates ready for Pre-Startup and Pre-Commissioning***	Red	Equipment Vendors	BYES
Level 2 – Pre-Startup and Pre-Commissioning, Installation Checks, Vendor confirms equipment installed correctly and is safe to energise. Equipment fully installed & ready for start-up complete with all documentation. ***Yellow Tag indicates ready for energisation***	Yellow	Equipment Vendors	BYES
Level 3 complete - Start-Up & Commissioning, Load Testing, Individual commissioning, and pre-tests complete with all documentation. ***Green Tag Indicates energisation/start up complete ready for functional testing***	Green	Equipment Vendors	BYES
Level 4 Complete - Functional performance tests / site acceptance tests complete with all documentation. All modes of operation tested on load. ***Blue Tag indicates functional tests complete ready for IST***	Blue	BVPI	BVPI
Level 5 complete - Integrated System Test complete with all documentation. ***White Tag indicates Cx Verification Complete***	White	BVPI	BVPI

10.5. Cx Tag / Placard

Equipment Placards similar to below shall be provided by BYES and installed on all relevant equipment. BYES and Global Cx shall be responsible for signoffs on Red/Yellow and Green sections. BVPI are responsible for signoffs on Blue and White sections. The Tag should include the logos of BVPI, Cloud HQ and BYES.

Equipment Tag Example



11. Commissioning Levels

11.1. Cx Level 1 Summary – Factory Tests/Equipment Installation

The factory testing and/ or factory witness testing will generally comprise of the following aspects:

- FWT script or method statement/ procedures to be provided to ELEPHANT in advance of FWT test date for comment.

- Manufacturer's documentation including but not limited to type test certificates, procedures, calibration certificates, data sheets will be provided as part of the FWT report for each plant item.
- A comments section is to be provided for all issues raised during the testing and documentation process and CHQ CXA Consultant will collate all issues accordingly in the IRL.
- The factory test documentation will consider the following:
    - Designers Specifications
    - Designers Drawings
    - Relevant regulations
    - Approved Technical Submissions
- The sequence of FWT shall be as follows:
    - Prepare and approve script/ method statement/ procedures
    - FWT logistics e.g., 2 weeks' notice for travel arrangements.
    - FWT pre-meeting
    - FWT testing schedule complete with anticipated durations
    - CHQ / BYES CXA Consultant FWT report for each type / model of equipment
    - Manufacturer report to be issued to BYES. BYES will incorporate the manufacturers report c/w test results and relevant certificates (type test and calibration) into a combined FWT report. This will be issued to ELEPHANT in draft for comment prior to finalisation.
    - All issues from all FWT shall be included on the IRL and DALUX platform
    - BYES shall track all factory test schedules and update commissioning team on a regular basis with FWT programme and update on the level 1 FWT tracker accordingly.
    - BYES to make all FWT test dates available to ELEPHANT in advance and ensure a minimum of 1 No place is available to ELEPHANT at all witnessing and commissioning events.

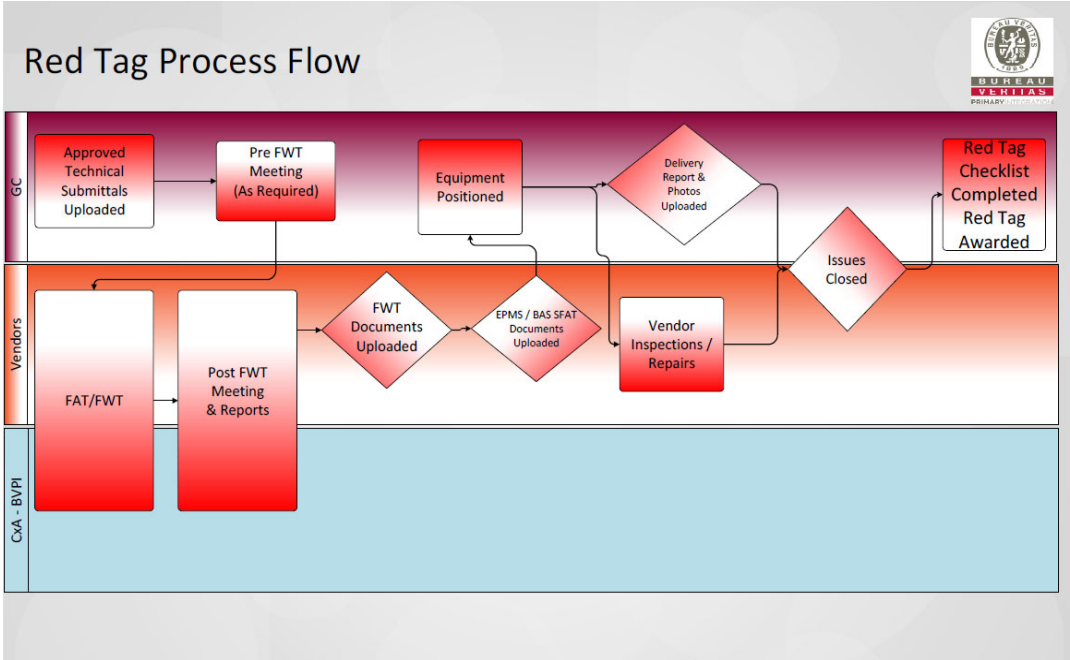
- The following factors shall be considered for the FWT:
    - Sequence of operation (SoO) (available for ELEPHANT comment in advance)
    - Consult all project team members at all necessary stages to enable final approval
    - Consider all interfaces and alarms as necessary
    - Factory testing shall be as per the agreed method statement and amended for future FWT as necessary
    - It must be noted the equipment shall be factory tested prior to shipping to construction site
    - The Cx team reserves the right to reject shipping if all issues are not resolved to the satisfaction of the Cx team. This may result in re-testing to resolve issues accordingly.
    - It is expected that all factory tests of equipment shall include for all correct components required for dynamic testing during the level 1 stage.
    - All modes of operation will be considered for the factory testing e.g., seasonal, manual, automatic etc as per the SoO and manufacturer requirements notwithstanding the Contract.
    - BYES and manufacturer will detail shipment requirements and scheduling requirements. Further to these all-necessary arrangements for protection of the equipment will be executed and particular attention to any storage requirements e.g. humidity, temperature and packaging requirements as per manufacturers and particular regulations.

Factory Witness Testing - is the process that the Factory goes through to test and verify that the equipment is working correctly, the customer will witness the testing. In many cases the factory would have completed the standard factory test prior to the arrival of the customer. The factory witness test shall be conducted with a test script that has been prepared by BYES and approved by all relevant parties. FWT are to be carried out on one of each type/model of equipment.

The Red Tag -Not Ready for Start-up:

- Meeting the requirements of the drawings and specifications without testing. This level requires a visual inspection prior to acceptance.
- This level has the requirement for testing and reporting to meet the demands of the Local codes and other standards as outlined in the design documentation and specifications.
- Generally, the level 1 red tag will be for the construction and installation of the equipment. The equipment has been successfully FWT tested, shipped to site and is in position, defect free and as designed.

Red Tag Process Flow Flowchart



11.2. Cx Level 2 Summary – Site Acceptance Inspection

BYES shall be responsible for the performance of Level 2, Site Acceptance Inspection including but not limited to scheduling, script development, meetings, documenting, reporting, execution, and verification.

The Team shall review and comment on the completed inspections and review the issues on a sample basis. The CHQ CXA reserves the right to carry out 100% check if deemed required and re-test if deemed necessary. Level 2 SAI Process is intended to establish a benchmark for effective

development of quality controls and to assure that quality control has been effectively implemented. BYES shall prepare a list of the benchmarks to be established for the construction phase.

A secondary objective of the process is to provide for a well-documented auditable trail of the construction process. The level 2 SAI process will be a documented quality control process.
Each piece of equipment shall receive a full SAI inspection by the appropriate parties. No sampling methods will be adopted.

The SAI testing for all equipment and systems shall be successfully completed, documented and all issues corrected prior to start up.

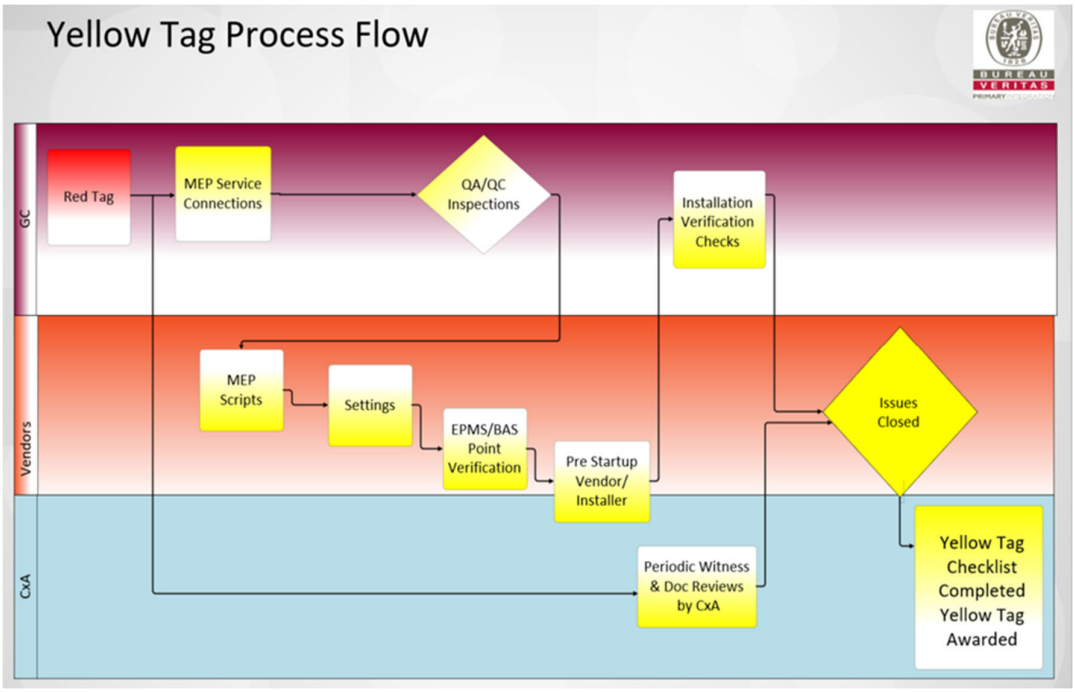
BYES shall prepare all necessary checklist to fully document all SAI checks in collaboration with the respective manufacturers, suppliers, vendors, sub-contractors, and issue as part of the method statements for the level 2 requirements. This will include checklists and inspections for all deliveries of equipment.

BYES shall provide maintenance schedules for all equipment and systems as necessary and as per manufacturers requirements. BYES will upload all method statements, test packs, test result templates, test results and delivery inspections.

The yellow tag- Ready for start up

- This Yellow Tag level requires the following to be completed prior to Yellow Tag issued:
- Red tag is issued and completed
- All electrical and mechanical inspections and tests are completed such as insulation resistance, hi-pot testing, megger testing, hydrostat testing, chlorination etc.
- Vendor's/ BYES/ installer Pre-Start-up is completed
- The system is ready to be energized.
- The Yellow Tag Inspection will verify that the previous items are successfully completed and would include having field inspection by BYES.
- All inspection and testing forms need to be submitted and reviewed prior to placing sticker on verified equipment.

Yellow Tag Process Flow Flowchart



11.3. Cx Level 3 Summary – Energisation, Start-Up & Commissioning

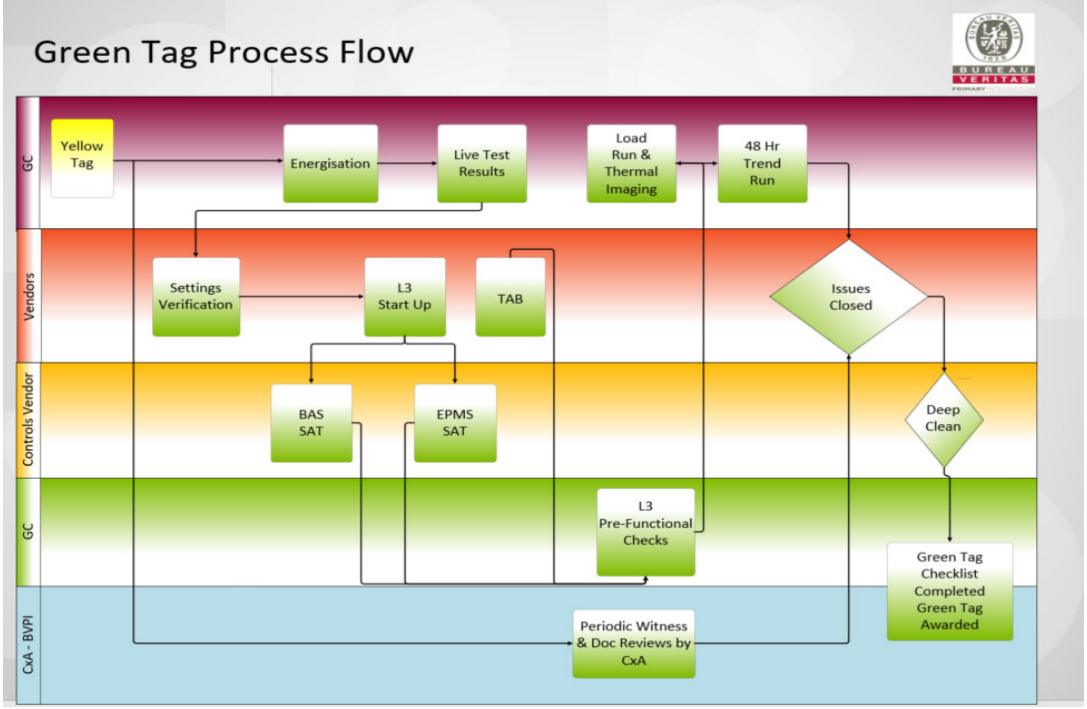
BYES will develop detailed start-up plans for all equipment. Startup of the equipment shall not be performed until the Yellow Tag Ready for Startup Tag has been signed off and placed on the equipment. Starting equipment that does not have the proper inspection completed and sign off is a Safety Violation and extreme care should be taken to ensure proper start-up process is adhered to. BYES will manage this process with CHQ CXA, ELEPHANT and Team.

Start-Up Review and Coordination– The CHQ CXA, ELEPHANT and Team shall review and comment on BYES, MEP Subcontractors and equipment and vendor's start up plans, procedures, and schedule. This includes energization; start-up; point to point checks for control systems; and site acceptance testing, HVAC pipe testing and flushing, and ductwork testing and cleaning. BYES shall conduct a pre-energization meeting prior to energizing the site to discuss the procedure and the associated risks and safety procedures that will be implemented and followed. This meeting will also review the lock-out/tag-out procedure that will be followed.

BYES shall conduct a pre-start up coordination meeting to verify proper procedures will be followed and to ensure systems started for temporary use will be appropriately protected. BYES shall have a person dedicated to the Start-up process to ensure that safety is adhered to and that all procedures are in place and managed properly. BYES shall verify all work and reporting is properly documented and uploaded to Cx Alloy. Correctly executed Level 3 testing is the key to a successful project. BYES along with the vendors are responsible for execution of the level 3 testing. As the schedule develops, BVPI will work with all parties to plan for Level 4 and Level 5 test execution. BVPI will ensure the sequence of operation for all equipment associated with the system are complete and no major

issues are present that may affect the functionality of the data centre. All equipment interface will be verified along with the equipment functionality in its operational environment.

Green Tag Process Flow Flowchart



Green Tag Push Items

All build issues must be closed prior to Green-Tagging of equipment or pushed to an Acceptance Issue
In the event there is an issue that needs to be pushed past Green-Tag, a build issue push meeting is conducted

Process

- The GC submits a list of build issues to the CxA recommended to be pushed.
- This list shall include the reasoning why the issue can't be resolved prior to Green-Tag and the expected resolution date. This shall be documented in the issue description.
- The issue cannot affect the operation of the equipment as it would then impact the FPT.
- The CxA reviews the list and passes on the issues they recommend be pushed to Cloud HQ.
- Cloud HQ will review and approve the final list and push the issues to Acceptance issues.

11.4. Cx Level 4 Summary – Functional Performance Testing

The purpose of the Functional Performance Testing (FPT) is to assure the owner that all work has been completed as specified and that the systems are functioning in the manner intended including failure scenarios.

Functional performance testing is the root of the commissioning process, during this process each system is tested to ensure that the component and system meets the performance and operational requirements as well as meets the design specifications.

The test data collected during FPT shall be used by operations for setting baselines for monitoring and controls. BVPI shall coordinate the FPT process.

BVPI shall develop Functional Performance Testing (FPT) scripts that dynamically verifies commissioned equipment under all modes of operation.

FPTs will verify all of the control system's sequences of operation (SoO) including failure scenarios and the system components will be checked to verify that they are responding in accordance with the SoO. Interface with the site building automation and electrical power monitoring systems will also be verified; this includes ancillary items such as EPO, Leak Detection and Fuel Monitoring as applicable.

FPT shall be conducted as many times as necessary to successfully demonstrate to the satisfaction of BVPI, and Commissioning team that the specified design criteria have been achieved. In the event of a testing failure, three (3) successful consecutive repetitions of the retest must be conducted.

Prior to Level 4 testing BVPI will ensure all scripts are written allowing enough time to be reviewed and commented on by all applicable parties. During the Level 4 CX stage of the project BVPI will functionally test each piece of equipment individually and then integrated with the wider systems (system level test).

As part of Level 4 CX BVPI will:

- Verify load banks are placed per the approved load bank plan and the load banking strategy is clearly defined to all parties
- Ensure all PQMs and temp/humidity data loggers are placed per the agreed plan and are set to record data from various events. This data will then be analysed by the BVPI engineers to ensure it meets performance specification.
- Ensure if applicable thermal imaging is completed if not completed at L3.
- Test all equipment in manual (where applicable), automatic operation, maintenance and in all failure modes and document their response as a pass/fail criterion
- Expected outcome/values will be detailed on scripts with acceptable tolerances.
- Verify integration with building monitoring and control systems (BMS/EPMS)
- Verify equipment capacity and performance under load

Support Requirements

As part of Level 4 execution BVPI will require support throughout from the Electrical contractor and various vendors. Many of the functional tests required at Level 4 will involve simulations and switching activity. Below sets out minimum support requirements for BVPI at Level 4.

I. All Electrical switching and switching plans shall be the responsibility of the Electrical Contractor
II. EPMS validation and BMS validation will require support from the respective vendors
III. Vendors may be called upon to operate their equipment and simulate certain conditions. Support may also be required for isolation and shutting down safely.

Electrical Testing:
BVPI expect to start electrical testing slightly ahead of mechanical testing as this will allow the majority of switching operations to be complete prior to mechanical systems testing. This is to ensure mechanical testing can continue uninterrupted. However, this is schedule dependent.

Electrical Testing Sequence:

1. Prior to level 4 testing the electrical team will conduct an on-site verification of the discrimination study/ Arc flash study and any equipment operating parameters that differ from default as requested by the client.
2. All inspections on equipment prior to level 4 testing will be conducted to ensure safety and compliance with specifications.
3. Alarm and EPMS verifications are expected to commence to ensure confidence of alarms when running plant on load.
4. Complete the switchgear verification (as much as possible) that may have a switching impact on mechanical plant. This ensures coordination between disciplines and allows both disciplines to continue testing without disruption.
5. The MV & Generator systems will be tested with load and verified ahead of UPS tests. This will include an overall system Test on the Ring System.
6. The UPS systems will then be tested with load. This is a critical operation that will require no interruption to cooling and therefore will be coordinated closely with the mechanical and construction teams. The UPS systems will also be tested on generator
7. Complete any outstanding switchgear verification both MV and LV
8. Test the data hall systems such as the Busway system and PDU's.

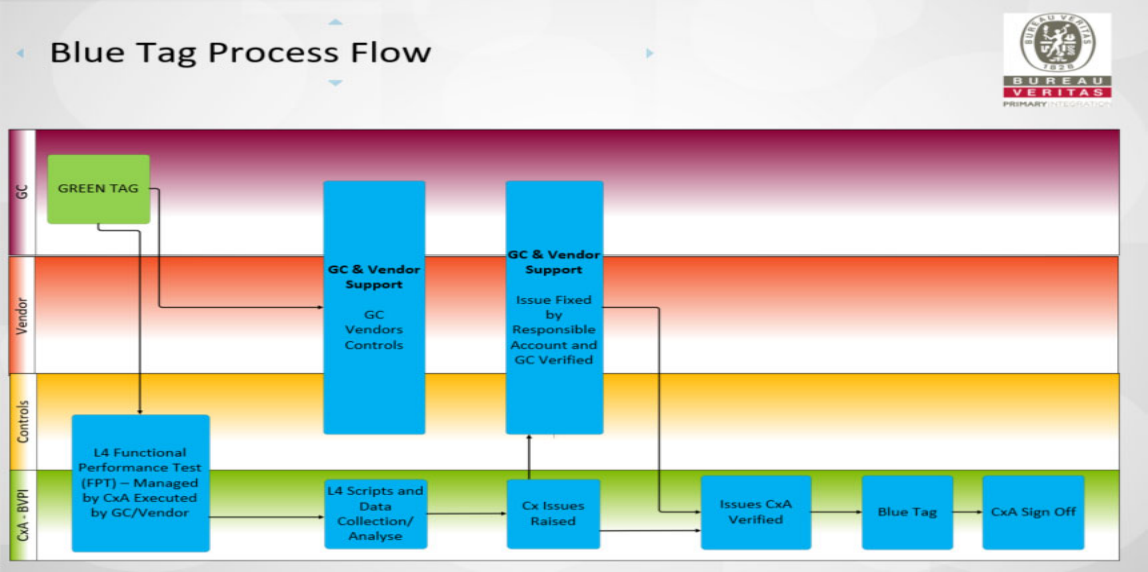
Mechanical Testing:
The mechanical testing inspections on various plant will be ongoing during the initial stages of the electrical testing with a view to start the functional testing after the switching operations are complete, this will be decided by BVPI internal discussions.

Mechanical Testing Sequence:

1. BMS Alarm verifications and Graphic checks
2. During the electrical testing, the mechanical team will perform their visual inspections and any testing that can be completed locally on the HVAC system plant.
3. Inspect and test the chilled water system where applicable
4. Test the Cooling operation under loaded conditions in the data hall.
5. Test functionality of the BMS system and system controllers

Level 4 – Systems Level Testing
The system level test or Pre-IST will be conducted in an area once all associated equipment has been successfully level IV tested. The area (data suites) will be loaded to their full capacity This test gives an opportunity to trial the system internally prior to offering the client attend the level 5 IST. Various failures will be completed on the systems to ensure its redundancy levels are per the basis of design. The system level test will be completed using the utility supply and the generator supply as per the Level 5 IST procedure

Blue Tag Process Flow Flowchart



11.5. Cx Level 5 Summary – Integrated Systems Test

The purpose of an Integrated System Testing (IST) is to verify that the installation of equipment and systems has been completed and complies with the Basis of Design and Owners' requirements. The IST shall test the facility as a whole system and how the interaction of the other systems effects the overall operation of the facility. During this testing various operational and failure mode testing shall be completed. Some tests may be repeated from previous levels since this is the first time the complete facility is operating at its designed load as a complete system and the interaction of these systems may need to be observed. IST Load of 11.2 MW of IT per phase.

The integrated system testing will be the final verification that the commissioned systems work in tandem with each other and under full automated control. The Integrated System Testing is directed by the BVPI team, with support from contractors and vendors. The Integrated System Testing is a hands-off test as far as system operation and response are concerned unless operator response is part of the designed sequence for the mode of operation under test. Manual transfers can be accommodated at the clients' request.

BVPI will ensure roles and responsibilities are communicated and that the PQM/ data logger plan and load banks plans are correctly actioned prior to IST. All communications will be detailed in an IST presentation plan as part of IST planning. Prior to IST, BVPI will conduct regular meetings with Colt and the end customer to ensure that all testing scenarios are captured in the IST test scripts and give ample time to address any comments.

All Level 5 scripts will be complete and closed on Cx Alloy. The IRL will be managed closely throughout the project and all open issues that will be detrimental to a successful IST will be addressed in advance.

Prior to IST script development, BVPI shall conduct IST planning and coordination meetings with the Commissioning team. The planning sessions will be held to identify the appropriate test scenarios for the project.

BVPI shall develop an IST summary plan that describes all test scenarios; defines test configuration parameters such as type and location load banks, test equipment and data loggers if applicable; defines data that will be captured using test equipment, BMS, EPMS, system displays and other equipment and systems to verify conditions.

BVPI shall develop Integrated Systems Test (IST) scripts in compliance with the documents listed under section 8 "Commissioning Requirements" that simultaneously validate the interdependency of each commissioned system during various facility events as well as power scenarios. IST will prove the data halls are capable of properly operating, recovering, and maintaining environmental space conditions and providing uninterrupted power during various events while under full load.

There shall be no sampling during the IST. All the systems shall be tested in the various combinations agreed to upon the development of the IST test script. Prior to conducting the IST BVPI will conduct an abbreviated Pre-IST to ensure the systems shall respond prior to conducting the final IST. It is envisaged that the IST testing will take 1 day to complete per data hall and completed in two stages. The exact days/period will be outlined in the schedule once finalized.

Stage 1 – Thermal increase (load) with verification of mechanical plant reaction and electrical system failures. The test will involve increasing thermal load in the data hall to 100% in steps. Electrical systems tests will form a major part of the first day of IST. The systems will be subjected to various failure modes to ensure the redundancy of the electrical plant. Responses of equipment to the failure events are monitored with the control systems, monitoring systems and operating/feedback parameters verified for correct functionality. The functionality of the mechanical systems under various electrical failure modes will also be monitored. Full details of all tests conducted will be incorporated into the L5 Test Scripts which will be reviewed, commented on, and approved prior to test. These shall incorporate all client and customer comments and requests.

Stage 2 – This is the major mechanical portion of IST. The purpose of the test is to ensure the environment stability and the cooling systems respond adequately to the applied load in each area and to various mechanical system failures. The HVAC systems will be failed to its base redundancy level to ensure thermal and environment stability. Full details of all tests conducted will be incorporated into the L5 Test Scripts which will be reviewed, commented on, and approved prior to test. These shall incorporate all client and customer comments and requests.

Once IST is complete BVPI will carry out a final inspection of the facility and document that all equipment is in its correct operational state with no alarms present. This document will be provided in the final report.

11.6. Cx Level 6 Summary – Acceptance & Handover

BVPI shall prepare the Final Commissioning Report for the project, which will include an executive summary, list of participants and roles, brief building description, overview of commissioning and testing scope and a general description of testing and verification methods. For each piece of

commissioned equipment, the report will contain the view of the Commissioning Authority regarding the adequacy of the equipment and documentation. The final commissioning report will include the CxA testing results obtained throughout the commissioning process including any unresolved issues, however it is expected that all issues would be closed and verified, and the performance of systems, subsystems, and equipment.

The commissioning report will indicate whether systems, subsystems, and equipment have been completed and are performing according to the Contract Documents. The testing documentation will be uploaded to Asite, and links included on the commissioning report. The commissioning report shall detail, but is not limited to, the following (as per customer's requirements, Annex 1):

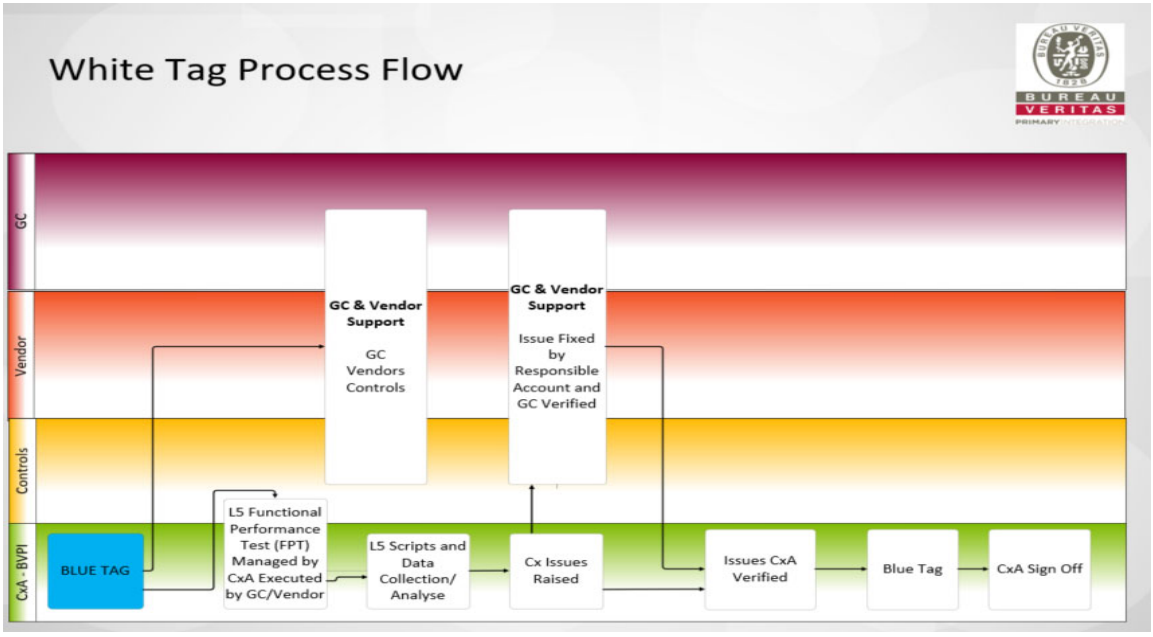
- Summary of commissioning activities
- Full list of equipment commissioned in the build
- As Left Settings for electrical and mechanical systems
- Primary/Secondary Injection Testing Reports for applicable breakers
- A signed & stamped electrical coordination/arc flash study
- Identified deficiencies
- Completed pre-functional verification checklists
- Completed Functional Performance Test scripts
- Completed Integrated system Test script
- BMS and EPMS screenshots
- Calibration Certificates for all test equipment used.
- Fire Authority Certification

As part of the Acceptance and Handover stage, BVPI will also review all O&M material and cross check both Hard & Soft copies. We will also complete a final review on training documentation. The O&M's and Training manuals shall be submitted by Bouygues.

Please see below process of how the O&M should be developed

1. O&Ms developed by BYES with their supply chain.
2. All data will be collected via Dome Connect
3. Cx Documents will be exported from Cx Alloy
4. First Draft of O&Ms should be issued as part of the substantial completion which is the handover from construction phase to acceptance phase.
5. First Draft should include all L1-L3 Cx Documents
6. First Draft should be put up on Asite in workflow for review by BVPI, Cloud and B&W
7. Comments to be reviewed and actioned following review above in point 5.
8. Second Draft issued following completion of IST
9. Second Draft should be put up on Asite in workflow for review by BVPI, Cloud and B&W
10. Second Draft should include all L4-L5 Cx Documents
11. Comments to be reviewed and actioned following review above in point 8.
12. Final Issue of O&M issued 15 business days after successful IST completion

White Tag Process Flow Flowchart



12. Document Storage & Responsibility

All design information shall be stored on Asite platform, including but not limited to design reports, schedules, drawings, technical submittals etc. This will be managed by the Main Contractor (MC) between Levels 0-3.

BYES and Global Cx along with all vendors will have access to Cx Alloy and will start uploading documents from FWT and Red Tag. For Yellow Tag, they will ensure that all documents have been uploaded. This will be under constant review by BVPI to ensure that Tags are not installed without issues resolved or supporting documents present on Cx Alloy against the assets. The same process shall be followed for Yellow and Green Tags with BVPI taking responsibility for Blue and White Tag documentation.

13. Loadbank and Monitoring Plan

BVPI will produce a separate and comprehensive load bank plan to the CIP to ensure correct placement of load banks which will guarantee correct load testing of equipment and areas. The load bank plan will detail the complete load banking strategy for the site (Levels 4 & Level 5). It will contain information required for all project Load Testing. The load bank plan will also show how BVPI will conduct load testing in the data hall at L5 identifying connection points and again where load banks should be placed for optimum testing of the cooling systems and ensuring the power infrastructure is tested to its maximum threshold.

BYES and Global Cx shall be responsible to upload for review a Loadbank Plan for L3 Tests. This will be reviewed by BVPI who will also take a coordinated approach in the development of L4 Tests following on from L3. BVPI will include a quantity of load banks required for level 4 and 5 testing once

the schedule is finalised. We will also conduct a meeting with relevant parties to ensure they fully understand their responsibilities during all load bank testing.

This plan will also include a PQM and an environment data logging plan. The plan will outline where the PQMs will be placed during Level 4 and Level 5 testing to ensure the end clients requirements are met. BVPI will provide a report to show the various equipment (UPS) meets ITIC (CBEMA) requirements.
The plan will outline the locations of data logging equipment to measure temperature and humidity of various locations and equipment during testing. The data will be presented in the final report.

14. Firmware & Software Changes

Equipment Firmware – Any firmware revisions will be conducted through the proper change management procedures. The firmware version that the FAT/FWT is conducted should not change throughout the project. If a change is required due to an operational issue, then it will be implemented through a proper change management notice (as above) with all relevant parties informed including BVPI. The change notice will highlight the changes between the new revision and the previous revision. A decision will be made on what testing is required to verify the updated firmware post correspondence.

BMS/EPMS Operating System Software Upgrade – Any BMS/EPMS operating software revisions will be conducted through the proper change management procedures. If a change is required due to an operational issue, then it will be implemented through a proper change management notice (as above) with all relevant parties informed including BVPI. The change notice will highlight the changes between the new revision and the previous revision. A decision will be made on what testing is required to verify the updated firmware post correspondence.

15. Additional Testing

We do not envisage any additional testing outside our normal contracted scope on the project, but should the need arise the process is outlined further here.

- If there is a requirement for additional testing to be carried out an official enquiry can be sent to the Project Manager.
- This will allow our technical team to review and ensure that the test will capture the test data and trends required by ensuring that we have selected the correct monitoring locations.
- All additional testing can be accommodated when required but it will need to be planned, scripted, approved and executed safely and correctly.

16. Project Close Out

During Project Close out, BVPI will support the Client, and the project team in the administrative close out of the commissioning project to ensure all documentation is presented in an acceptable and timely manner and within 30 days or less post IST.

17. Commissioning Schedule

BYES shall develop a detailed commissioning schedule with all tasks and deliverables required to complete the Commissioning Process BYES shall develop the commissioning schedule through the

completion of level 3. BVPI will provide L4-L5 schedule which shall be incorporated by BYES into on "master" schedule.

The schedule is a living document and shall be monitored throughout the project and updated as needed. The BYES shall provide the commissioning agent with the latest construction schedule BYES shall incorporate the commissioning milestones into the construction schedule.

BYES and Global Cx Team shall work together to incorporate the construction and commissioning process to meet the target dates for the project. BYES shall complete construction in a phased approach so the BYES CXA can complete all level 4 testing prior to the level 5 IST start date.

The following key milestones identified for all Main Commissionable assets. There should be a start / finish date against all single line items below.

- Red Tag (L1)
- Construction Complete
- QA/QC Checks
- Pre-Startups
- Documentation Review & Approval
- Yellow Tag (L2)
- Equipment Energised
- L3 Startup/SAT/Load Bank
- EPMS SAT
- Thermography Checks (IR Scans)
- Green Tag (L3)

Load banks and heat load test equipment utilization. BYES to prepare plan and procurement schedule accordingly. A minimum of 2 days shall be included in the schedule for a Pre-IST and a minimum of 1 weeks shall be included for the IST.

A minimum of 10 working days shall be included in the schedule for level 1, 2 and 3 script reviews.

A minimum of 10 working days shall be included for level 4 script reviews.

A minimum of 5 working days shall be included for level 5 script reviews. Level 5 IST script shall be approved minimum 5 working days prior to commencement of the IST.

Schedule Coordination and Review

BVPI will work with relevant parties to ensure coordination of the project schedule with the commissioning program requirements is achieved. To address this, the initial commissioning schedule is provided in the construction documents. The schedule lists each piece of equipment to be commissioned along with the project milestones that must be achieved prior to the start of each level of commissioning.

BVPI project manager will meet with the team to review the schedule and adjust as required. Once all team members are satisfied with the master schedule, it is set as the baseline. As the project

progresses, the BVPI project manager will review the schedule regularly with the project team at commissioning meetings and adjust where required.

18. Reporting & Forecasting

Weekly Cx Reports

BVPI will compile weekly reports throughout the L2 – L3 commissioning process. These reports shall indicate the following:

- Weekly activities
- Project Resources
- BVPI Deliverable Status
- Current Tagging Status
- Risk register
- IRL
- FAT & Document Trackers
- RFI Summary (if applicable)
- Look Ahead Programme

These reports will be distributed via email to CloudHQ, and all parties nominated by them in the commissioning process. This report will be uploaded to Asite.

Daily Cx Reports

BVPI will compile daily reports throughout the L4 commissioning process. These daily reports shall indicate what testing was performed, new issues identified, issues resolved, etc. and will be distributed via email to CloudHQ and all parties nominated by them involved in the commissioning process. The DCR will be uploaded to Asite.

2 Week Lookahead and Planned v Actual

BYES and Global Cx shall produce at a minimum a 2 week look ahead for all Cx activity for Cx Levels 1-3. They shall also be responsible to produce "planned" tag dates for each tag against each asset. This will allow measurement to gain run rate on progress and highlight any potential slippages where mitigation will be required. BVPI will assist BYES with this and provide a tracking template in which all these dates can be populated.

19. Meetings

Bouygues will hold regular site meetings throughout the project life cycle. It is envisaged that during the Level 1 - Level 3 phases, the meeting will be attended by BVPI. This meeting will be attended by BVPI via Microsoft Teams initially. This meeting will discuss any potential risks to the project initially including any design deficiencies or sequence of operation anomalies. It will discuss progress on site and will identify any trends associated with on-site issues. BVPI will discuss the IRL and address any issues that require closure to ensure the project progresses in a timely manner. All relevant parties are requested to attend the weekly meeting so any action items can be addressed quickly.

During the Level 4 & Level 5 process, the commissioning meetings will be held each morning. Again, all relevant personnel will attend the meeting including BVPI, Bouygues and contractors/vendors. BVPI will:

- Outline daily and weekly testing activities
- Discuss the IRL and issues to closure
- Discuss any issues with testing and any risks to completion schedule
- Ensure the load bank/PQM plan is adhered to and no delays are encountered

The main function of the morning commissioning meeting is to discuss issues raised the day previous and logged on the IRL. Each company/person responsible for rectifying these issues is expected to have an update on the issue resolution the following morning. The typical expectation is that issues are to be closed a maximum of 2 days after they are raised. For the schedule to be successful issue management and timely issue closure is vital.

In addition to the daily on-site meetings, during L4, one weekly meeting will be set up by BVPI for remote access to provide status updates to the client who might be oversees.

20. Roles & Responsibilities

The commissioning process requires the active participation of all project team members in varying degrees throughout the design, construction, testing, and turnover of the facility. A description has been included below to allow a concise summary of each team members' roles and responsibilities.

Client – Cloud HQ
The client is the final decision maker on all unresolved issues. Their role is to be actively involved in the project and provide input to decisions and guidance on how to interpret the written project requirements. When commissioning enters the active testing phase, the client is invited to have their staff participate to enhance their understanding of the project and installed systems.

Customer – Elephant
The customer might be actively involved in the project and provide input to decisions and guidance on how to interpret the written project requirements. When commissioning enters the active testing phase, the customer may be invited as required to have their staff participate to enhance their understanding of the project and installed systems.

Any communication with the Customer will be handled via the Client. Any involvement of the Customer in the commissioning activities is defined by discretion of the Client.

Commissioning Authority - BVPI
The Commissioning Authority (BVPI) develops and plans the commissioning effort, documents the program, and communicates each team members' roles and responsibilities in the execution of the commissioning activities. The BVPI will ensure the Cx process is being executed by all responsible parties and will also ensure the Cx process is documented correctly during level I- level 6). BVPI will be responsible for directing all parties during level IV and level V commissioning.

Main Contractor - Bouygues
The representative to manage the entire construction process. They will lead the project and consult with the client to support informed decision making. They are primarily responsible for the execution of L0 -L6 Cx Process whilst supported throughout by BVPI.

The primary decision maker on what equipment is selected to support the Mechanical, Electrical, and Plumbing /Fire Protection (MEP/FP) systems being installed on the project. They are responsible for design, sizing, and configuration of the infrastructure that will support the project.

Vendors/Contractors

The various organizations that provide materials and equipment to the project are members of the extended commissioning team. They may be called upon to answer questions that arise during planning or help resolve problems uncovered during testing. The quality of their organizations and products is relied upon as a foundation upon which the overall quality of the project is built upon.

21. Control Sequence / Sequence of Operations Review

Control sequences will be developed by others and will be reviewed by the BVPI team as part of the design process. The BVPI team will review control sequences for mechanical systems, electrical systems, and any applicable subsystems. Any comments raised will be added to the design review log as above. Once the SoO is finalized and agreed by all parties, it will be the final version used by the vendors and CxA to write their respective test scripts. This document is critical to a successful design review.

It is expected all equipment that has automation and/or an automation interface with other equipment will have a sequence of operation document.

22. Lessons Learnt

Will be included in the Final Cx Report. A live lessons learned log shall be kept throughout the project lifecycle.

23. Training Requirements

To be added in next revision

24. Safety

Please refer to BVPI's separate Health and Safety Plan which details our rules, procedures, and policies. It also discusses in detail our day-to-day management across the project.

25. Commissioning Glossary

Term	Definition
Acceptance	A formal action, taken by a person with appropriate authority (which may or may not be contractually defined) to declare that some aspect of the project meets defined requirements, thus permitting subsequent activities to proceed.
Basis of Design	A document that records the concepts, calculations, decisions, and product selections used to meet the Client's Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.

Term	Definition
Checklists	Verification checklists that are developed and used during all phases of the commissioning process to verify that the Client's Project Requirements are being achieved. This includes checklists for general verification, plus testing, training, and other specific requirements.
Commissioning	See Commissioning Process
Commissioning Authority	An entity identified by the Client who leads, plans, schedules, and coordinates the commissioning team to implement the Commissioning Process.
Commissioning Plan	A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the Commissioning Process.
Commissioning Process	A quality focused process for enhancing the delivery of a project. The process focuses upon verifying and documenting that the facility and all of its systems and assemblies are planned, designed, installed, tested, operated, and maintained to meet the Client's Project Requirements.
Commissioning Process Activities	Components of the Commissioning Process
Commissioning Process Progress Report	A written document that details activities completed as part of the Commissioning Process and significant findings from those activities, which is continuously updated during the course of a project. Usually incorporated into the Commissioning Plan as an ongoing appendix.
Commissioning Report	A document that records the activities and results of the Commissioning Process. Usually developed from the final Commissioning Plan with all of its attached appendices.
Commissioning Team	The individuals who through coordinated actions are responsible for implementing the Commissioning Process.
Construction Checklist	A form used by the contractor to verify that appropriate components are onsite, ready for installation, correctly installed, and functional. Also see Checklists.
Construction Documents	These include a wide range of documents that will vary from project to project and with the Client's needs and with regulations and countries. Construction documents usually include the project manual (specifications), plans (drawings), and general terms and conditions of the contract.

Term	Definition
Contract Documents	These include a wide range of documents that will vary from project to project and with the Client's needs and with regulations and countries. Contract Documents frequently include price agreements, construction management process, subcontractor agreements or requirements, requirements and procedures for submittals, changes, and other construction requirements, timeline for completion, and the Construction Documents.
Coordination Drawings	Drawings showing the work of all trades to illustrate that equipment can be installed in the space allocated without compromising equipment function or access for maintenance and replacement. These drawings graphically illustrate and dimension manufacturers' recommended maintenance clearances.
Design Intent Documentation	Design Intent Document (DID) is a term frequently used to define design phase narratives that explain how proposed designs respond to the OPR and how the building is to operate. The DID includes quantifiable systems analysis and design values and should be updated as design modifications are made throughout the project delivery process.
Issues Log	A formal and ongoing record of problems or concerns – and their resolution – that have been raised by members of the Commissioning Team during the course of the Commissioning Process.
Nominal Group Technique	A formal, structured brainstorming process used to obtain the maximum possible ranked input from a variety of viewpoints in a short period of time. The typical approach is a workshop session where a question is presented, the attendees record their responses individually on a piece of paper, the individual responses are recorded on a flip chart without discussion in a round robin fashion, all of the responses are discussed, and then the participants rank their top five responses.
Ongoing Commissioning Process	A continuation of the Commissioning Process well into the Occupancy and Operations Phase to verify that a project continues to meet current and evolving Client's Project Requirements. Ongoing Commissioning Process activities occur throughout the life of the facility; some of these will be close to continuous in implementation, and others will be either scheduled or unscheduled (as needed).
Client's Project Requirements	A written document that details the functional requirements of a project and the expectations of how it will be used and operated. These include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information. (The term Project Intent is used by some Clients for their Commissioning Process Client's Project Requirements.)

Term	Definition
Quality Based Sampling	A process for evaluating a subset (sample) of the total population. The sample is based upon a known or estimated probability distribution of expected values; an assumed statistical distribution based upon data from a similar product, assembly, or system; or a random sampling that has scientific statistical basis.
Re-Commissioning	An application of the Commissioning Process requirements to a project that has been delivered using the Commissioning Process. This may be a scheduled re-commissioning developed as part of an Ongoing Commissioning Process, or it may be triggered by use change, operations problems, or other needs.
Retro-Commissioning	The Commissioning Process applied to an existing facility that was not previously commissioned. This guideline does not specifically address retro-commissioning. However, the same basic process needs to be followed from Pre-Design through Occupancy and Operations to optimize the benefits of implementing the Commissioning Process philosophy and practice.
Systems Manual	A system focused composite document that includes the operation manual, maintenance manual and additional information of use to the Client during the Occupancy and Operations Phase.
Test Procedure	A written protocol that defines methods, personnel, and expectations for tests conducted on components, equipment, assemblies, systems, and interfaces among systems.
Training Plan	A written document that details the expectations, schedule, budget, and deliverables of Commissioning Process activities related to training of project operating and maintenance personnel, users, and occupants.
Verification	The process by which specific documents, components, equipment, assemblies, systems, and interfaces among systems are confirmed to comply with the criteria described in the Client's Project Requirements.

26. Annex Overview

Annex 1 - End user specific testing requirements
Annex 2 – CC1 Equipment List
Annex 3 – CC2 Equipment List (Not Included Awaiting Issue)
Annex 4 – L1-L3 Equipment Tag Checklists
Annex 5 – Cx Kick Off
Annex 6 – High Level Program CC1 & CC2