

EXPLO National Manual for Projects Management

Volume 10, chapter 1

Introduction to Testing and Commissioning



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Introduction to Testing and Commissioning

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1.0 PURPOSE

The purpose of this document is to familiarize the end-user with the content of Volume 10 - Testing and Commissioning which is part of EXPRO Projects White Book.

By reading this introduction, the end-user can have a general understanding of scope and main topics described in Testing and Commissioning documents

2.0 SCOPE

The scope of Introduction to Testing and Commissioning is to provide a brief description of below listed documents, part of Volume 10:

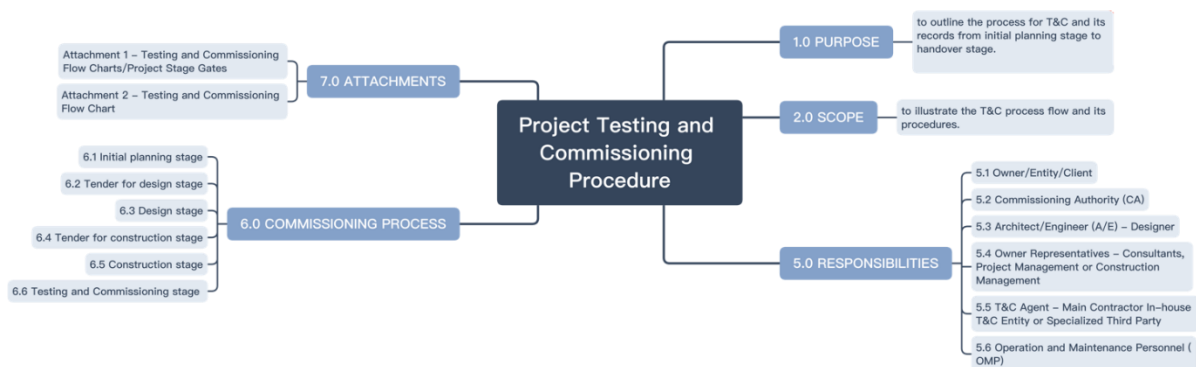
1. Project Testing and Commissioning Procedure- EPM-KT0-PR-000006
2. Project Testing and Commissioning Guideline- EPM-KT0-PR-000003
3. Testing and Commissioning Checklist and Templates-EPM-KT0-RG-000007

2.1 Project Testing and Commissioning Procedure

This document provides an overview of Testing and Commissioning Process from Pre-Design to post-occupancy testing and commissioning work and associated flow charts.

Describes the Role and Division of Responsibility for main stakeholders involved in Commissioning process: Owner, Architect/Engineer, Main Contractor, Operation and Maintenance, Entity Project Management Organization (EPMO).

Explains the Commissioning team responsibilities and provides commissioning deliverables and references.



2.2 Project Testing and Commissioning Guideline

This document provides description of standalone equipment and systems, methodology of individual testing and commissioning and integration tests to ensure an efficient, safe, reliable and functional project, systems and buildings.

Defines the current terms used in commissioning field.

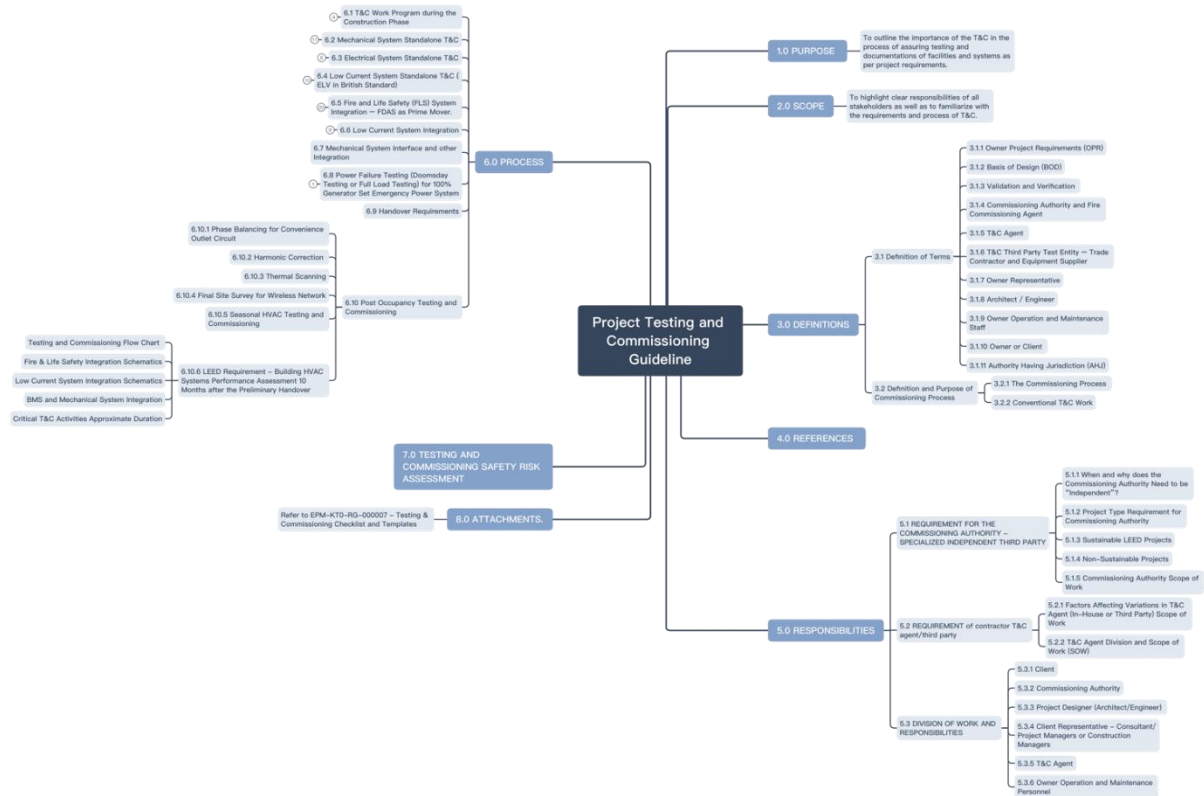
Identify some of the reasons for project delays related to commissioning and propose a corrective plan.



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Explains the sequence of testing required to assess duration for each activity and for Contractor to prepare the Testing & Commissioning work schedule and manpower loading in coordination with the General Project Schedule.

Emphasizes the role of Project Management Organization from early stages of the project through construction up to Handover/Closeout.



2.3 Project Testing and Commissioning Checklists and Templates

The document represents a set of tools which can be used:

- To support the EXPRO Projects White Book Testing and Commissioning Guideline and Project Testing and Commissioning Procedure for better understanding of Pre-commissioning and Commissioning process.
- To provide to the end-user the supported documents in the preparation of Testing and Commissioning Methodology (Procedures) for infrastructure projects.

In the Attachments are the most common mechanical, electrical, plumbing equipment checklist and templates to be used /tailored during pre-commissioning and commissioning stages.

3.0 DEFINITION

Definitions	Description
Commissioning Record	Testing and Commissioning documentation that includes issues log, commissioning plan & methodology, progress reports, submittal and O&M manual reviews, training record, test schedules, checklists, start-up reports, functional tests, and trend log analyses.
EPMO	An Entity Project Management Organization, this is an integrated team that comprises the Entity and its PMC responsible for managing all the Entity's projects.



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Definitions	Description
Integration Methodology	Is a part of the overall Testing and Commissioning methodology and is a written protocol which defines procedures and expectations for testing conducted on equipment, assemblies, systems, and interfaces (or integration). The document includes test prerequisites, testing conditions, limitation and tolerance, tools and instruments to be used, schematics, and safety risk assessment.
Building Commissioning	A quality assurance process both during and after building construction to ensure that appropriate systems and components are installed, tested and maintained according to design requirements
Owner/Entity/Client	Whenever the term is used in this guide, it pertains to the entity, authority, ministry, project direct engineering management staff, and end-users representing the government interest
Commissioning Authority (CA)	Company appointed by the Owner / Entity / Client to oversee the Testing and Commissioning activities. The Commissioning Authority acts independently of other parties and reports directly to the Owner / Entity / Client. A CA may not be appointed for all projects depending on scale and complexity. The role is undertaken by the EPMO

4.0 REFERENCES

The supporting documents- references- for this Introduction are Testing and Commissioning Document List and T&C Checklist and Templates shown in Attachment 5.1 and Attachment 5.2.

5.0 ATTACHMENTS

- Attachment 1 - Testing and Commissioning Document List
- Attachment 2 - T&C Checklist and Templates List



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Attachment 1 - Testing and Commissioning Document List

#	Title	Document No.
	Volume 10, Chapter 1	
1	Project Testing and Commissioning Procedure	EPM-KT0-GL-000006
	Volume10, Chapter 2	
2	Project Testing and Commissioning Guideline	EPM-KT0-GL-000003
	Volume10, Chapter3	
3	Project Testing and Commissioning Checklists and Templates	EPM-KT0-RG-000007



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Attachment 2 - T&C Checklist and Templates List

1. EPM-KT0-TP-000001 - Checklist - Pre-start up for Pumps
2. EPM-KT0-TP-000002 - Checklist - Pre-start up for Fire Pumps
3. EPM-KT0-TP-000003 - Checklist - Pre-start up for Fans
4. EPM-KT0-TP-000004 - Checklist - Pre-start up for Centralized AHU
5. EPM-KT0-TP-000005 - Checklist - Pre-start up for VAV Box
6. EPM-KT0-TP-000006 - Checklist - Pre-start up for FCU
7. EPM-KT0-TP-000007 - Checklist - Pre-start up for CRAC
8. EPM-KT0-TP-000008 - Checklist - Pre-start up for Chillers
9. EPM-KT0-TP-000009 - Checklist - Pre-start up for Cooling Towers
10. EPM-KT0-TP-000010 - Checklist - Pre-start up for Plate Heat Exchangers
11. EPM-KT0-TP-000011 - Checklist - Pre-start up for Boilers
12. EPM-KT0-TP-000012 - Checklist - Pre-start up for Condensate Recovery Unit
13. EPM-KT0-TP-000013 - Checklist - Pre-start up for Water Treatment Plant
14. EPM-KT0-TP-000014 - Checklist - Pre-start up for Waste Water Treatment Plant
15. EPM-KT0-TP-000015 - Checklist - Pre-start up for Electric Traction Elevator
16. EPM-KT0-TP-000016 - Checklist - Pre-start up for Escalator and Moving Walks
17. EPM-KT0-TP-000017 - Checklist - Pre-start up for Building Maintenance Unit (BMU)
18. EPM-KT0-TP-000018 - Checklist - Pre-start up for Generator Set
19. EPM-KT0-TP-000019 - Checklist - Pre-energization for HV/MV Switchgear
20. EPM-KT0-TP-000020 - Checklist - Pre-energization for Switchboards
21. EPM-KT0-TP-000021 - Checklist - Pre-energization for Transformers
22. EPM-KT0-TP-000022 - Checklist - Pre-commissioning for HV/MV Ring Main Unit
23. EPM-KT0-TP-000023 - Checklist - Pre-commissioning for HV/MV Capacitor Banks
24. EPM-KT0-TP-000024 - Checklist - Pre-energization for MV/LV Automatic Transfer Switch
25. EPM-KT0-TP-000025 - Checklist - Pre-energization for UPS
26. EPM-KT0-TP-000026 - Checklist - Pre-energization for MCC/Distribution Boards
27. EPM-KT0-TP-000027 - Checklist - Pre-energization for HV/LV Cables
28. EPM-KT0-TP-000028 - Checklist - Pre-commissioning for Grounding (Earthing)
29. EPM-KT0-TP-000029 - Checklist - Functional and Performance Test for Fire Pumps
30. EPM-KT0-TP-000030 - Checklist - Functional and Performance Test for Chilled Water Pumps
31. EPM-KT0-TP-000031 - Checklist - Functional and Performance Test for Central Fans
32. EPM-KT0-TP-000032 - Checklist - Functional and Performance Test for Centralized AHU
33. EPM-KT0-TP-000033 - Checklist - Functional and Performance Test for CRAC (Precision Unit)
34. EPM-KT0-TP-000034 - Checklist - Functional and Performance Test for FCU
35. EPM-KT0-TP-000035 - Checklist - Functional and Performance Test for Cross Flow Cooling Towers
36. EPM-KT0-TP-000036 - Checklist - Functional and Performance Test for Boilers
37. EPM-KT0-TP-000037 - Checklist - Functional and Performance Test for Water Treatment Plant
38. EPM-KT0-TP-000038 - Checklist - Functional and Performance Test for Waste Water Treatment Plant
39. EPM-KT0-TP-000039 - Checklist - Functional and Performance Test for Condensate Recovery Unit
40. EPM-KT0-TP-000040 - Checklist - Functional and Performance Test for Electric Traction Elevators
41. EPM-KT0-TP-000041 - Checklist - Functional and Performance Test for Escalators and Moving Walks
42. EPM-KT0-TP-000042 - Checklist - Functional and Performance Test for Building Maintenance Unit
43. EPM-KT0-TP-000043 - Checklist - Functional and Performance Test for HV/MV Capacitor Banks
44. EPM-KT0-TP-000044 - Checklist - Functional and Performance Test for UPS
45. EPM-KT0-TP-000056 - Checklist - Functional and Performance Test for Pressure Independent VAV
46. EPM-KT0-TP-000045 - Template - NFPA 20 for Fire Pumps Acceptance Test Form
47. EPM-KT0-TP-000046 - Template - FDAS Test Package
48. EPM-KT0-TP-000047 - Template - Earth Electrode Testing
49. EPM-KT0-TP-000048 - Template - Door Intercom Testing
50. EPM-KT0-TP-000049 - Template - Car Park Access System Testing
51. EPM-KT0-TP-000050 - Template - Security and Access Control Testing



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- 52. EPM-KT0-TP-000051 - Template - BMS Graphics Testing
- 53. EPM-KT0-TP-000052 - Template - BMS Control Set-point and Parameter Testing
- 54. EPM-KT0-TP-000053 - Template - BMS and EPMS PTP and Loop Testing
- 55. EPM-KT0-TP-000054 - Template - Cable Testing
- 56. EPM-KT0-TP-000055 - Template - Equipment/Device Calibration log
- 57. EPM-KT0-TP-000057 - Checklist - Pre-start Up for VoIP
- 58. EPM-KT0-TP-000058 - Checklist - Functional and Performance Test for VoIP
- 59. EPM-KT0-TP-000059 - Checklist - Pre-start Up for LAN/WLAN
- 60. EPM-KT0-TP-000060 - Checklist - Functional and Performance Test for LAN/WLAN
- 61. EPM-KT0-TP-000061 - Template - Warranty of Material
- 62. EPM-KT0-TP-000062 - Checklist- Testing & Commissioning Process
- 63. EPM-KT0-TP-000063 - Energization Notice
- 64. EPM-KT0-TP-000064 - DESIGN TURNOVER CERTIFICATE