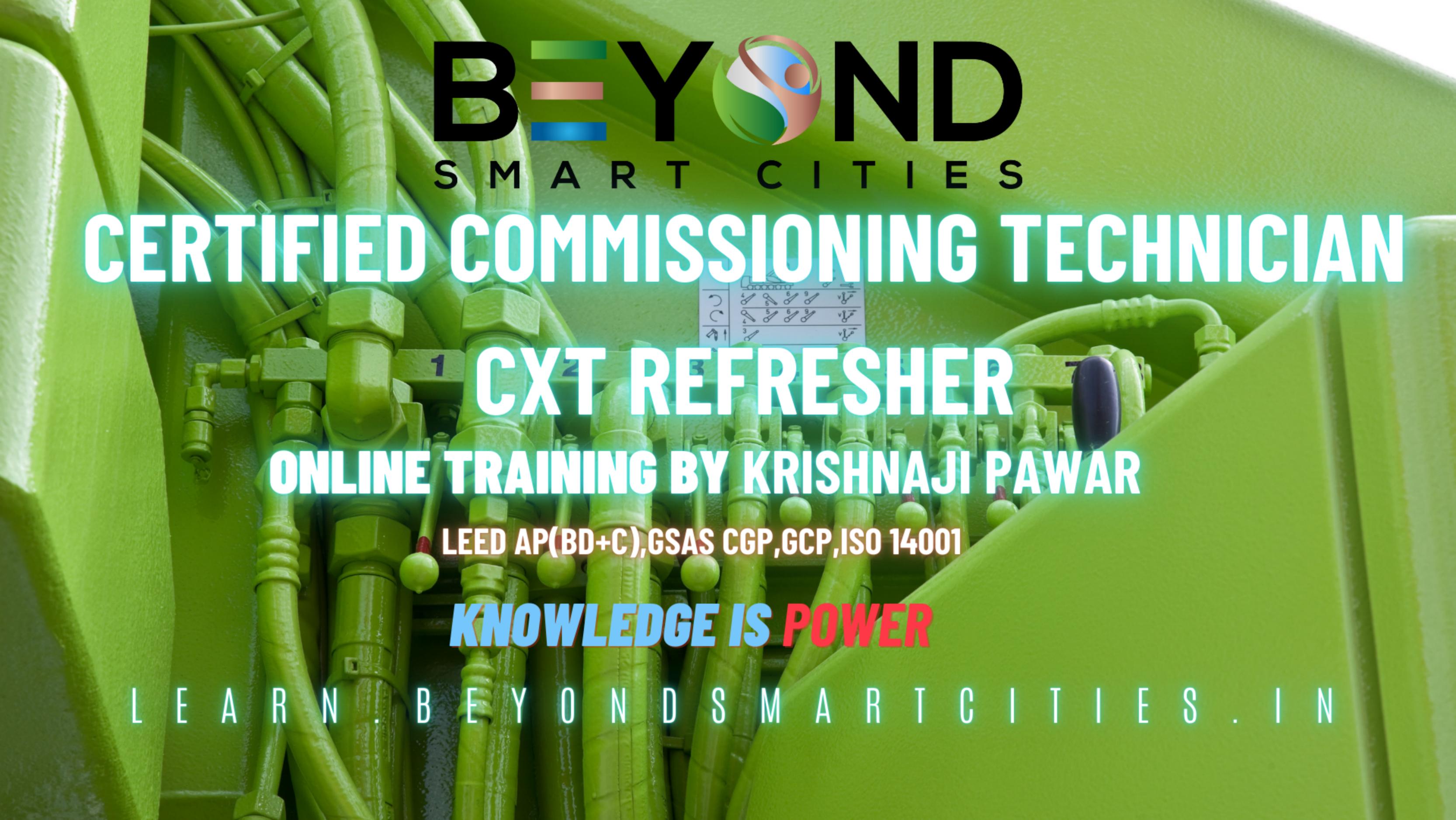


# ERP

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# BEYOND SMART CITIES





**B E Y O N D**  
S M A R T C I T I E S

**CERTIFIED COMMISSIONING TECHNICIAN**

**CXT REFRESHER**

**ONLINE TRAINING BY KRISHNAJI PAWAR**

**LEED AP(BD+C), GSAS CGP, GCP, ISO 14001**

**KNOWLEDGE IS POWER**

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MODULE

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# O&M Paperwork & Training Preventive Maintenance

KRISHNAJI PAWAR - CEO & FOUNDER

LEED AP(BD+C),GSAS CGP,GCP,ISO 14001

[WWW.BEYONDSMARTCITIES.IN](http://WWW.BEYONDSMARTCITIES.IN)





# CERTIFIED COMMISSIONING TECHNICIAN CXT REFRESHER

The commissioning phase of a project involves the transition from construction to operational readiness, where systems undergo testing, verification, and fine-tuning to meet operational requirements. This phase is crucial for establishing effective operations and maintenance (O&M) protocols, which include the preparation and organization of necessary paperwork and training of personnel.

# Learning Objectives

- Document Observations & Interpret Basic Terminal Unit Trends.
- Test Airside ,water,control system / Troubleshooting
- Required O&M paperwork and training Preventive maintenancetems
- Retro-commissioning
- Commissioning professional certification & its importance.
- Point-to-point calibrate MEP & sensor systems.
- Green building rating systems & commissioning
- Summary and Resources
- CxT Practice Exam: Test Your Knowledge!



# INTRODUCTION

- The commissioning phase of a project involves transitioning from construction to operational readiness, testing, verifying, and fine-tuning systems.
- Effective operations and maintenance (O&M) protocols are crucial for maintaining system reliability and longevity.

# O&M DOCUMENTATION

- O&M documentation provides a comprehensive reference for system operation, maintenance, and troubleshooting.
- Types of O&M documentation include Operation Manuals, Maintenance Manuals, and Warranty Documentation.
- Maintenance Manuals provide detailed instructions on system functioning, such as system overview, operating procedures, and safety guidelines.
- Warranty Documentation specifies terms and conditions of coverage for equipment and systems, including coverage details and claim procedures.



# DOCUMENTATION MANAGEMENT

- Proper management of O&M documents is essential for effective communication and compliance.
- Documentation management includes version control, accessibility, and training records.



# TRAINING FOR PREVENTIVE MAINTENANCE

- Training is essential to ensure personnel are knowledgeable and capable of executing preventive maintenance tasks effectively.
- Training components include initial training, ongoing training, and evaluation of training effectiveness.
- The integration of comprehensive O&M paperwork and effective training protocols during the commissioning phase is fundamental to achieving operational excellence and sustainability.



# BUILDING SYSTEMS PERFORMANCE AND OPERATIONS AND MAINTENANCE

- Building systems performance is sustained post-project through effective facility operations and maintenance (O&M) procedures, detailed documentation, and comprehensive staff training.
- O&M should be considered from the Project Initiation Phase to extend the system's usable life.
- ANSI/ASHRAE/IES Standard 202-2018: Commissioning Process for Buildings and Systems includes sections on training and operation.
- Poor O&M can lead to degraded performance, failure to achieve the OPR or CFR, and potential for expensive system repairs or premature equipment replacement.
- Modern buildings often include multiple interconnected systems, which are critical to human life and safety.
- An effective O&M program includes training, staffing, budgeting, and management procedures.
- O&M staff can include professionals managing, operating, maintaining, controlling, protecting, and cleaning building systems.
- Building engineers perform much of the daily O&M work on building systems, working closely with the facility management or property management team.





# NECESSARY O&M DOCUMENTATION AND TRAINING

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# ROLE OF O&M DOCUMENTATION



- Provides detailed instructions on system operation and maintenance.
- Includes Operation Manuals, Maintenance Manuals, As-Built Drawings, Technical Specifications, and Warranty Information.

# IMPORTANCE OF COMPREHENSIVE O&M DOCUMENTATION

- Facilitates Knowledge Transfer: Ensures knowledge is not lost during personnel changes.
- Enhances Safety: Provides clear operational guidelines and safety protocols.
- Improves Efficiency: Streamlines maintenance procedures and reduces downtime.
- Supports Compliance: Helps organizations comply with regulatory requirements regarding documentation and maintenance practices.



# TRAINING IN SYSTEM COMMISSIONING

- Includes Initial Training Sessions, On-the-Job Training, Refresher Courses, and Assessment and Certification.
- Reduces Human Error: Equips personnel with skills necessary to operate systems correctly.
- Promotes System Longevity: Well-trained staff are more likely to perform maintenance tasks effectively.
- Enhances Troubleshooting Skills: Training enables personnel to identify and resolve issues swiftly.



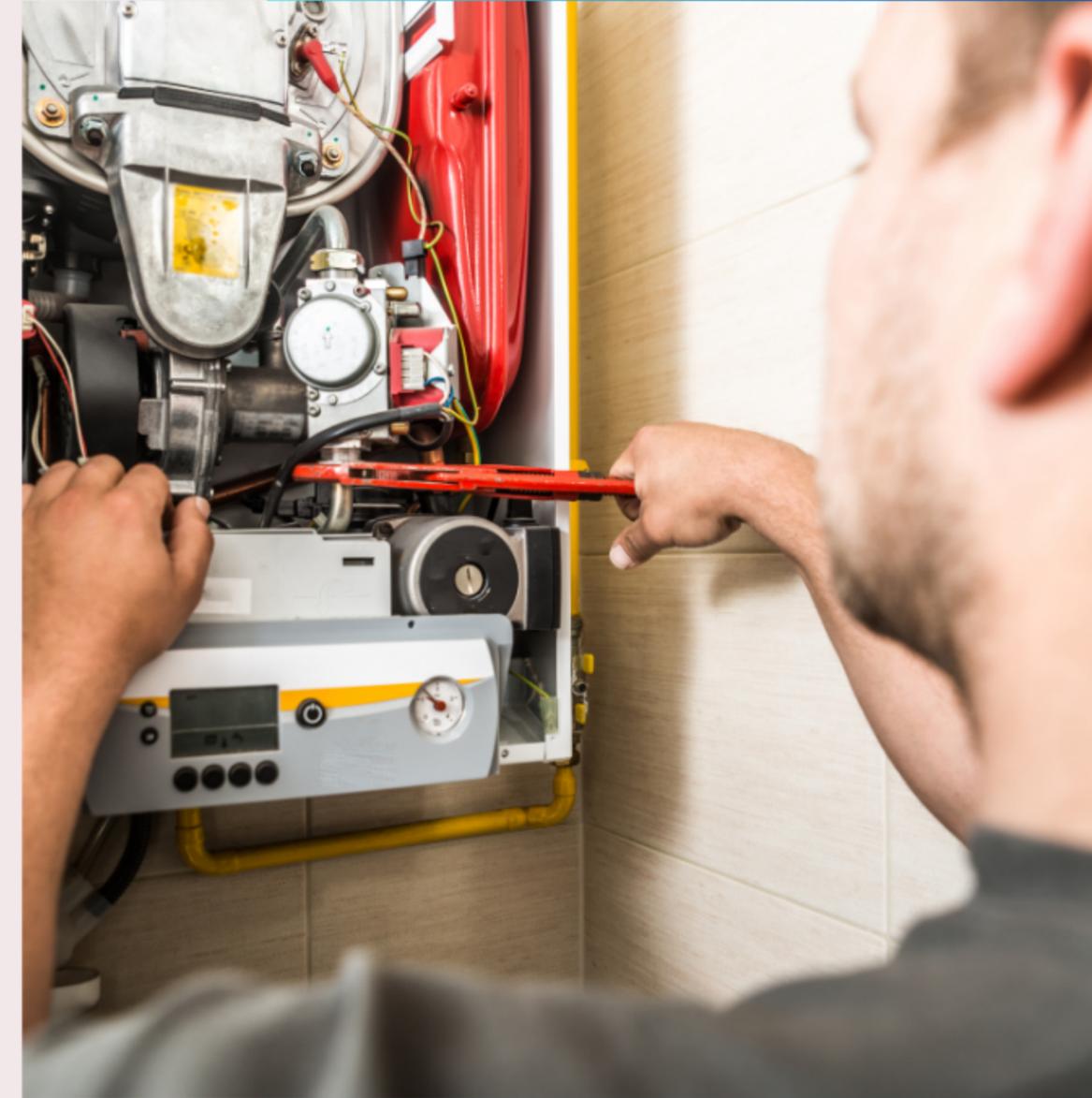


# PREVENTATIVE MAINTENANCE PRACTICES



# DEFINING PREVENTATIVE MAINTENANCE

- Defined as scheduled maintenance activities to prevent unexpected equipment failures or to mitigate system performance degradation.
- Classified into Time-Based Maintenance (TBM), Condition-Based Maintenance (CBM), and Predictive Maintenance (PdM).



# IMPORTANCE OF PREVENTATIVE MAINTENANCE



- Contributes to Operational Efficiency, System Reliability, Safety Compliance, and Sustainability.
- Ensures equipment lifespan and reduces waste through thoughtful resource management.

# IMPLEMENTING PREVENTATIVE MAINTENANCE IN BUILDING COMMISSIONING

Starts during the design phase and extends throughout the operational lifecycle of the building.

## Key steps include:

- Development of a Maintenance Plan.
- Training and Documentation.
- Regular System Inspections.
- Use of Technology.
- Feedback Loops.



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S M A R T C I T I E S

**CONTACT US**



+91 6363032722



info@beyondsmartcities.in



learn.beyondsmartcities.in



#55,HMR Layout ,Bengaluru ,India



# THANK YOU

