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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***

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

# BEYOND

SMART CITIES

MODULE  
**12L2**

Retro-commissioning -  
Evaluate HVAC, control,  
lighting control, and  
equipment types.

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

Retro-commissioning is a systematic process that optimizes the performance of existing building systems, particularly HVAC (Heating, Ventilation, and Air Conditioning) systems, control systems, and lighting systems. This evaluation involves inspecting existing equipment types, such as fan coil units, constant volume (CV) and variable air volume (VAV) air handling units (AHUs), and pump systems, to identify deferred maintenance issues.

# Learning Objectives

- Document Observations & Interpret Basic Terminal Unit Trends.
- Test Airside ,water,control system / Troubleshooting
- Required O&M paperwork and training Preventive maintenancetems
- Evaluate HVAC, control, lighting control, and equipment types
- 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

- Retro-commissioning (RCx) is a systematic process that optimizes the performance of existing building systems, particularly HVAC systems, control systems, and lighting systems.
- The process involves inspections, data collection, and operational understanding to improve energy efficiency, comfort, and operational effectiveness.

# EVALUATION OF HVAC SYSTEMS AND EQUIPMENT TYPES



- HVAC systems are integral to building occupants' comfort and health.
- Effective evaluation involves inspecting existing equipment types such as terminal units, constant volume and variable air volume air handling units (AHUs), and pump systems.
- Common deferred maintenance issues include dirty coils and filters, improperly sized ducts, and leaky ductwork.
- Recording nameplate data from HVAC equipment is crucial for identifying equipment specifications, benchmarking performance, and compliance with local building codes and energy regulations.

# EVALUATION OF CONTROL SYSTEMS AND EQUIPMENT TYPES

- Control systems in HVAC applications typically consist of building automation systems (BAS) that manage the operation of HVAC equipment based on various parameters.
- Reverse engineering sequences of operation is crucial for evaluating control systems.
- Evaluating control systems is vital for optimizing energy use, enhancing comfort, and identifying faults in system performance.



# EVALUATION OF LIGHTING CONTROL SYSTEMS AND EQUIPMENT TYPES



- Lighting control systems play a significant role in energy efficiency and occupant comfort.
- Common lighting technologies to evaluate include T8 Fluorescent Lamps and Compact Fluorescent Lamps (CFL).
- Determining occupancy hours is important for evaluating lighting systems.
- Properly managed lighting can significantly reduce energy consumption and enhance occupant comfort.



# TEST AND RECORD TAB READINGS



# TESTING AND RECORDING TAB READINGS

- TAB is a critical process in retro-commissioning that ensures HVAC systems operate as designed.
- Key parameters for measurement include air velocity, airflow (CFM), static pressure profiles, as-found readings, and operational parameters.
- Each measurement should be recorded in a consistent format, including date and time, measurement location, conditions, and measuring instruments.



# CREATING AN ASSESSMENT REPORT FROM MEASUREMENT RECORDS

- The purpose of the assessment report is to consolidate findings from TAB readings and provide a comprehensive overview of system performance.
- The structure of the assessment report includes an executive summary, introduction, methodology, findings, analysis, recommendations, and conclusion.
- Findings include presenting results of TAB readings, comparing as-found readings against design specifications, using visual aids, and discussing implications of findings.
- Recommendations include adjusting balancing dampers, replacing filters, and upgrading equipment.
- The report's recommendations can lead to significant improvements in energy efficiency and occupant comfort.





# CREATE ASSESSMENT REPORT FROM MEASUREMENT RECORDS

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# ASSESSMENT REPORT STRUCTURE



- Executive Summary: Briefly summarizes objectives, key findings, and overall outcomes of the retro-commissioning effort.
- Introduction: Provides background information on the building, outlining the methods used for data collection, analysis, and identification of deficiencies.
- Findings: Presents data on baseline performance versus post-implementation performance.

# ASSESSMENT REPORT STRUCTURE +

- Recommendations: Lists actionable recommendations for corrections, including estimated costs, potential energy savings, and other benefits.
- Conclusion: Summarizes the significance of findings and the importance of ongoing commissioning efforts.
- Appendices: Include raw data, charts, and additional documentation supporting the report's conclusions.





# CONTACT US



+91 6363032722



[info@beyondsmartcities.in](mailto:info@beyondsmartcities.in)



[learn.beyondsmartcities.in](http://learn.beyondsmartcities.in)



#55,HMR Layout ,Bengaluru ,India



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