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MODULE 6

Value Engineering and commissioning

KRISHNAJI PAWAR - CEO & FOUNDER

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

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Learning Objectives

- Introduction & Design Phase Overview
- Prepare specifications:
- Project Manual Review
- Design Phase Activities
- Commissioning Design Review
- Value Engineering
- Risk Management

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INTRODUCTION

- After predesign comes the schematic design phase.
- Assuming that the owner's commissioning authority was fully involved in predesign, the CxA knows exactly what the owner wants from the project and can help the design phase go well.
- Before talking about design details, it's important to know how the commissioning authority and the design professional work together.
- The CxA's job is to help the design professional come up with the best system design for the project and make sure that the DP's preferred design concepts meet all of the owner's project requirements for performance.
- During design, keep in mind the two main ideas of the owner's building commissioning quality assurance process: Quality is made sure of by the group that gives the order.

COMMISSIONING SPECIFICATIONS

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- The specifications can make or break a project based on what they say and how well they say it.
- It takes both art and science to come up with good specifications.
- Not All firms are good at coming up with quality standards.
- And when it comes to specs for commissioning, many, if not most, designProfessionals don't know nearly enough about what makes a good commissioning specification.
- Also, the commissioning industry hasn't grown up enough for the experts in the specification The writing business has come up with standards for commissioning.
- So, most of the time, a design professional is breaking new ground with each new commission-specification.

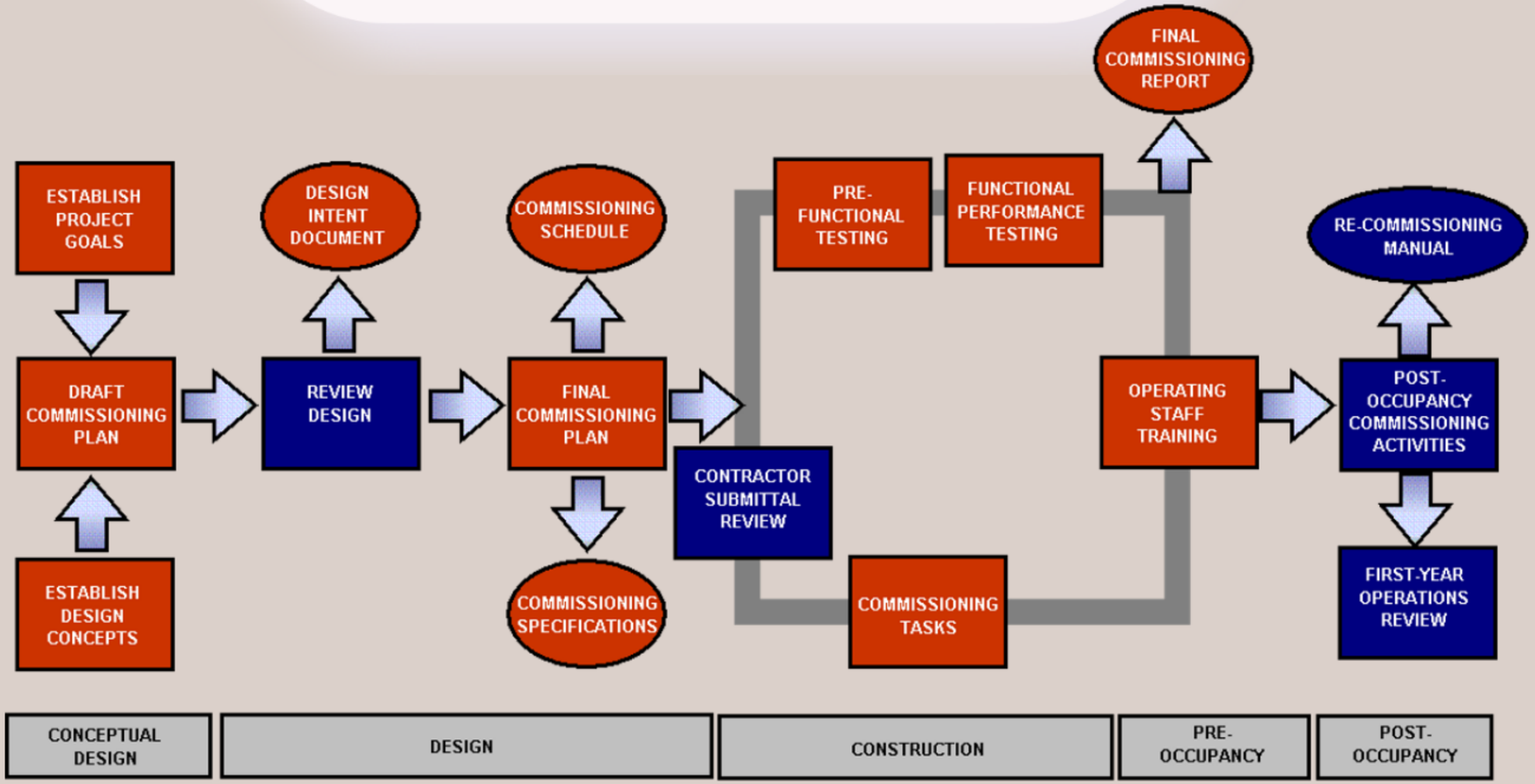


COMMISSIONING SPECIFICATIONS+

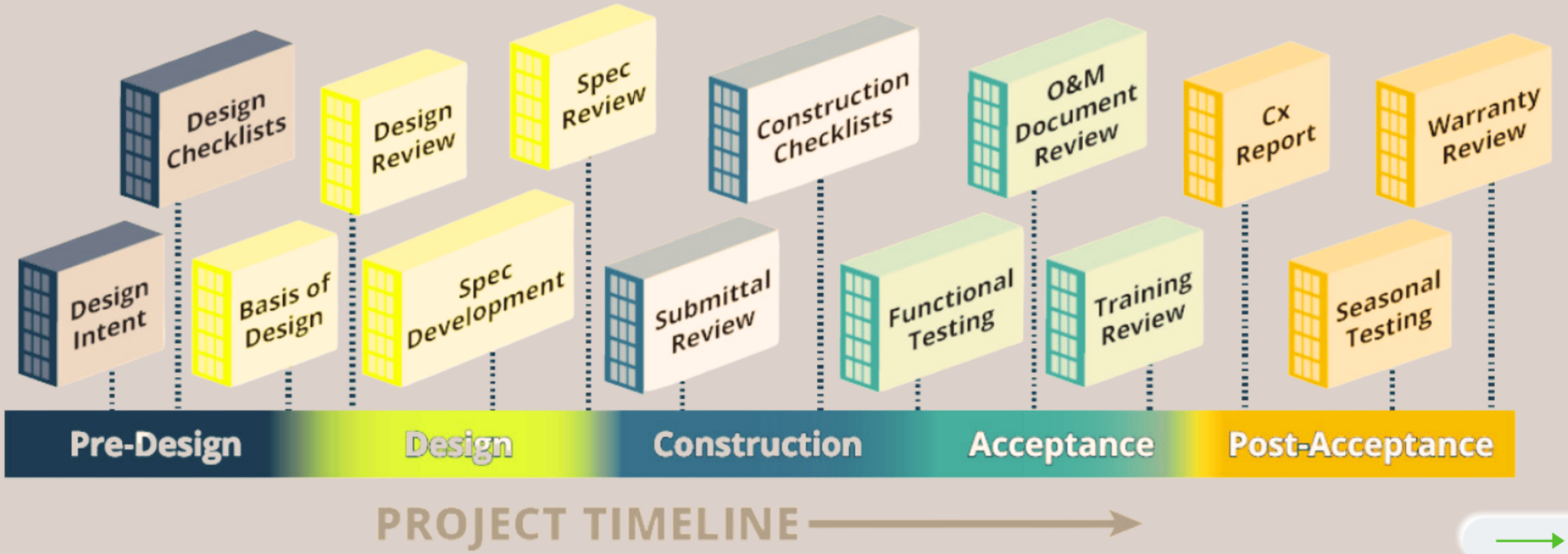
- A skilled commissioning authority has another big chance to have a big impact on the success of the commissioning program by making sure that the important parts of the commissioning specifications have been covered.
- The The next few paragraphs can only summarize requirements; they can't guarantee that design professionals who read them will immediately start making commissioning specifications for the content and quality needed to get the job done.
- It takes a long time, a lot of practice, and a lot of thought and intuition to learn how to do so.



Phases of Commissioning



Commissioning Activities



PROJECT MANUAL REVIEW

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- The project manual contains the technical project specifications that enable the construction team to implement the design team's vision for the building.
- In addition to the specifications, the project manual includes bidding requirements, contract forms, general conditions, and supplementary conditions.
- The Commissioning Provider (CxP) develops the Commissioning Specification for inclusion in the Project Manual, but the CxP should also review the Project Manual to identify incorrect, inadvertent, and important references to commissioning within the project specifications.
- By scouring the project manual for commissioning-related discrepancies, the CxP provides a beneficial service to the owner and project team generally, and the Cx Team specifically.
- Digital document search tools can help the CxP quickly and easily find commissioning-related conflicts in the project manual.



COMMISSIONING DESIGN REVIEW





- The review of the design documents, or commissioning design review, is an extremely important but often overlooked or undervalued part of the commissioning process.
- For the Commissioning Design Review, the Commissioning Provider (CxP) reviews design documents (i.e., drawings and specifications) and the Basis of Design (BoD) as they are produced by the design team during the Design Phase.
- The commissioning design review is one of the CxP's principal commissioning activities during the design phase.
- The design team's response to the Commissioning Design Review may include changes to the BoD, which in turn may motivate the CxP to make corresponding changes to the Commissioning Plan (Cx Plan).
- The CxP completes the Commissioning Design Review with the mindset of evaluating the extent to which the design meets the OPR or CFR.

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VALUE ENGINEERING

- Owners often require value engineering or value management to lower building project startup costs.
- This analysis may influence the owner's decision to proceed with a project's current design.
- The independent third-party commissioning provider (CxP) can help value engineering by providing objective process analysis and feedback to the owner.
- The CxP must look beyond initial costs when considering value engineering project design options.
- Total cost of ownership (TCO) includes initial costs, future operations, and long-term project decisions.
- The CxP should reduce owner TCO.
- A full TCO analysis considers the owner's financial impacts throughout the project.
- Value engineering and lifecycle cost analysis often miss hidden costs, but TCO may.



VALUE ENGINEERING+





- TCO analysis can help capital development and O&M staff make owner-friendly building design and construction decisions.
- CxPs can best serve owners by independently assessing future costs and effects of equipment and system choices.
- The TCO CxP should assess the broader effects of value engineering-identified building equipment and system design alternatives.
- The design team may overlook the possibility that proposed changes to one building system may increase the first costs or ongoing O&M costs of other building systems in a new construction project or existing facility.
- Value engineering design alternatives should be examined by the CxP for energy consumption and indoor environmental quality.
- Emergency operations and non-standard conditions should be considered by the CxP when evaluating value engineering results.

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VALUE ENGINEERING++

As a representative of the owner's interests, when the owner, design team, and CxP discuss design alternatives developed through value engineering, the CxP should encourage the following best practices:

- Utilize a cost estimator to confirm that the costs presented by the contractor or another party are valid and reasonable.
- Request detailed lists of the individual components and anticipated effects factored into developing each design option.
- Identify the risks to the owner of accepting a design alternative but not receiving updated design documents reflecting the full impacts of that decision.
- Evaluate the comprehensive effects of each decision on future operations and maintenance (O&M) expenses.
- Encourage the owner to establish prices and schedule timeframes for reversing or modifying a previous decision.





VALUE ENGINEERING+++



- Understanding and analyzing the potential effects of design alternatives on the project's compliance with the OPR or CFR should be the primary responsibility of the CxP during the value engineering process.
- The CxP's efforts during this phase of the project may determine whether the owner is completely satisfied upon project completion and handover or frustrated with not achieving the desired and intended results now and throughout the life of the project.
- By performing TCO analysis and being straightforward with the owner about the potential consequences of various design options identified through value engineering, the CxP can assist the owner in making decisions more likely to result in a successful project.

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COMMISSIONING AS RISK MANAGEMENT

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- Most people familiar with commissioning recognize the quality assurance benefits of the commissioning process.
- By identifying design and construction issues for the owner and project team, a commissioning agent helps to improve the overall quality of a building project.
- Commissioning as Risk Management While quality assurance is an important aspect of the commissioning process, a more owner-centric concept is emerging in the commissioning industry: risk management.
- Risk management is important for building owners because it helps to protect the returns on their financial investments.
- The early adopters of risk management in commissioning are not surprisingly those that face some of the greatest risks for system or product failures.
- Risk management is an important part of pharmaceutical manufacturing, an industry that faces considerable risks in terms of product waste and product safety.
- "Minimizing Risk, Maximizing Value As the scope of the commissioning effort increases, there is an opportunity to manage more of the risk associated with the project elements.
- Although "risk management" has not yet become a part of the conversations I have regularly with commissioning clients, it is evident that our clients are increasingly seeing the value of an expanded commissioning scope.



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CONTACT US

+91 6363032722

info@beyondsmartcities.in

learn.beyondsmartcities.in

#55,HMR Layout ,Bengaluru ,India



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CERTIFIED COMMISSIONING SPECIALIST CCS

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