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## **BUILDING SYSTEMS COMMISSIONING**

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**Workshop**

**F-gases: Responsible Use, Environment and Energy**

**Athens, 29 September 2003**

# What is Commissioning (Cx)?

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- ♦ **Building system Commissioning.**
- ♦ **Control Commissioning.**
- ♦ **Provision for Commissioning in all documents.**
- ♦ **A process administered by a person (CA).**
- ♦ **Includes testing of equipment and systems.**
- ♦ **Assure O&M documentation is correctly prepared.**
- ♦ **Cx process continues after the end of construction.**

# Why do Commissioning?

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- ◆ **Owners are beginning to realize the cost of not commissioning.**
- ◆ **Studies have shown that commissioned buildings use between 8% to 20%, less energy.**

## Definitions for Existing Building Commissioning:

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- ♦ **Retrocommissioning :**  
The existing facility has never been commissioned.
- ♦ **Recommissioning :**  
Reviewing equipment and system that have been commissioned.
- ♦ **Continuous Commissioning :**  
On-going process of reviewing the operation of system of equipment for maximum efficiency.

# Defining Commissioning

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- ◆ **Building system Cx is a systematic process beginning in the design phase and lasting at least one year after project close-out, including the training of operating staff.**

# Defining Commissioning

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- ◆ **Control system Cx is the systematic process of functionally testing the software programming in the controller within the control system.**
- ◆ **Verifying that the system programs perform as designed and as per the controls submittal.**

# What to Commission?

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- ◆ **Chilled Water System.**
- ◆ **Air Handling System.**
- ◆ **Control systems.**

# Commissioning Phases & Tasks

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- ◆ **Program Phase.**
- ◆ **Design Phase.**
- ◆ **Construction Phase.**
- ◆ **Acceptance Phase.**
- ◆ **Warranty Phase.**
- ◆ **Post acceptance Phase.**

# Benefits & Costs of Cx

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- ♦ **Cost of not Commissioning:**
  - ❖ New energy management control systems have improper or incomplete programming.
  - ❖ Equipment and lighting schedules are not optimized.
  - ❖ New equipment functions poorly or not at all.
  - ❖ Components and equipment are missing or incorrectly installed.
  - ❖ Building documentation is big on volume but small on content.
  - ❖ O&M training is typically poor or non-existent.

# The Commissioning Plan

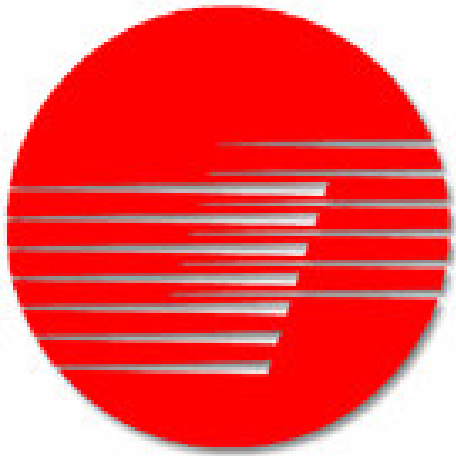
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- ♦ **1. Introduction**
- ♦ **2. Scope of Commissioning Process**
- ♦ **3. Commissioning Team Members-Roles and Responsibilities**
- ♦ **4. Communication Protocol**
- ♦ **5. Commissioning Meetings**
- ♦ **6. Sample Documentation**
  - ❖ a. Project Commissioning Report Form
  - ❖ b. Project Deficiency Tracking Log

# The Commissioning Plan

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- ❖ c. Test verification Report Form
- ❖ d. Equipment Prefunctional Test Checklist (PFT)
- ❖ e. Functional Test Procedure (FTP)
- ❖ f. Training Verification Form
  
- ❖ **7. Project Schedule**
- ❖ **8. Owner Training**
- ❖ **9. Project Directory**
- ❖ **10. Appendixes**



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