

The Structure of Life-cycle Commissioning Process

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Table of Contents

- **INTRODUCTION**
- **CLASSIFICATION OF COMMISSIONING PROCESS**
- **O&M' s ROLE**
- **NEW DEFINITION OF ON-GOING COMMISSIONING AND Re-COMMISSIONING**
- **OUTLINES OF CONTINUOUS COMMISSIONING PROCESS**
 - **On-going Commissioning Process**
 - **Re-Commissioning Process**
- **LIFE-CYCLE COMMISSIONING PROCESS**
- **CONCLUSION**

Presentation

- Commissioning Activities in the world
- APCBC, the footprint
- Commissioning Process and Terminology
 - Initial Commissioning
 - Retro-Commissioning
 - Continuous Commissioning
- On-going Commissioning
- Re-Commissioning
- Life-Cycle Commissioning
- Role of BOFD and BEMS
- Principle of Environmental Circle

Commissioning Map, Japan and World

SHASE

BEMS Committee → Commissioning Committee

**2000 Yamatake
Research Center**

**2003 Tokyo
Electric Co. T-bldg.**

**2005~ Chubu
Electric Co. A-bldg**

**2005~ Red Cross
Medical Center**

**Building
Services Cx
Association
Japan**

CSTB

IBEC,Jp

**IEA/nnex40, 47
Cx Process**

NIST

ASHRAE

**PECI/NCBC
Cx Projects**

GSA

**UK
CIBSE/BSRIA**

DOE

**BCA(USA)
Total Building Cx**

Taiwan

**Hong Kong
Bldg. Cx Center**

ICEBO

**Texas
A&M Univ.**

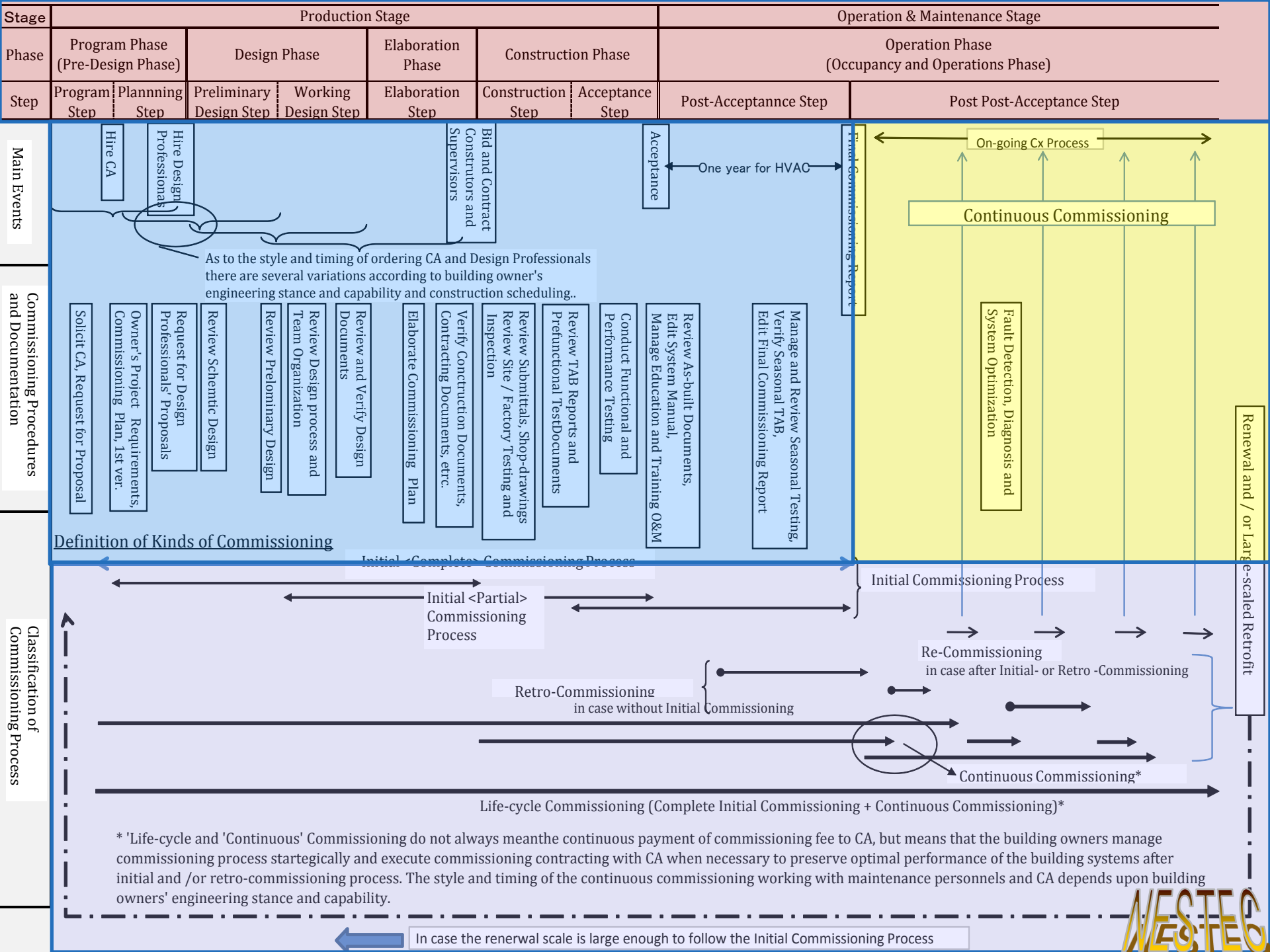
**Wisconsin
Univ.**

**Laurence
Berkley NL**

Asia Pacific Conference on Building Commissioning

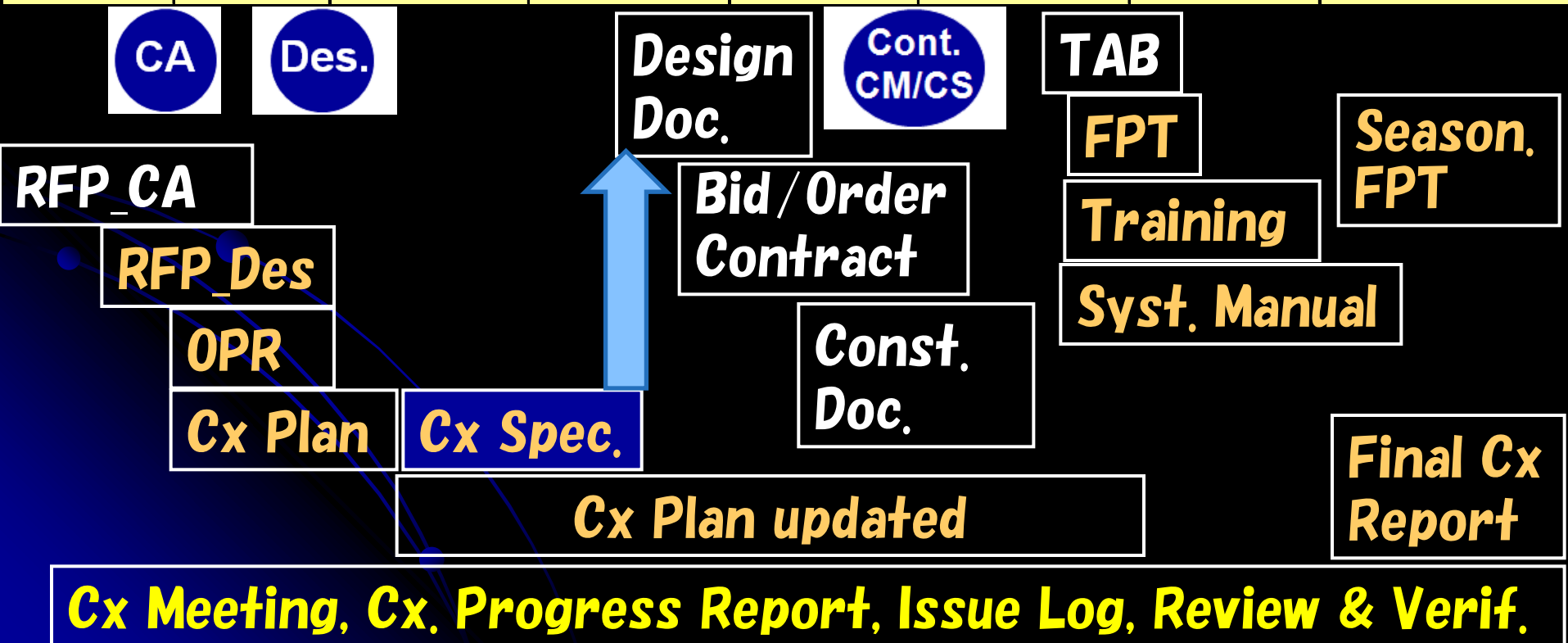
Progress of APCBC

- **August 2002: Mr. Wong (HK) visited Nakahara (Japan) for cooperative relation on Building Commissioning (Nagoya)**
- **April 2003: International Short Symposium on HVAC Commissioning / Annex 40 Kyoto meeting (Kyoto)**
- **October 2003, ISHVAC-03, Tsinghua U. (Beijing)**
 - Study and Practice on HVAC System Commissioning, NN
- **October 2004: ICEBO-04 / Annex40 (Paris)**
 - JAPANESE VISION OF COMMISSIONING PROCESS AND ASIAN VIEW, NN
- **April 2006, NCBC-06 (San Francisco)**
 - Promoting Commissioning Process in Japan, Nakahara
- **November 2006, #1 APCBC-06 / ICEBO-06 / Annex47**
- **May 2007, NCBC-07 (Chicago)**
 - Overview on Activity of Building Commissioning in Asia and Japan, Shimazu and NN
- **October 2007, #2 APCBC-07 (Workshop) / Annex47, Kyoto**
- **November 2008, #3 APCBC-08, Hong Kong**



Commissioning Process for New Construction

Production Stage							Operation Stage
Program Phase (Pre-Design Phase)		Design Phase		Elabolation Phase	Construction Phase		(Occupancy & Operation Phase)
Program Step	Planning Step	Preliminary Design Step	Working Design Step	Elabolation Step	Construction Step	Acceptance Step	Post-Acceptance Step



Continuous Commissioning Process (ASHRAE 0-2005)

- **Continuous Commissioning Process: A continuation of the Commissioning Process well into the Occupancy and Operations Phase to verify that a project continues to meet current and evolving Owner's Project Requirements. Continuous Commissioning Process activities are on-going for the life of the facility**

On-Going Commissioning Process

- **On-Going Commissioning Process: A continuation of the Commissioning Process well into the Occupancy and Operations Phase to verify that a project continues to meet current and evolving Owner's Project Requirements. On-Going Commissioning Process activities occur throughout the life of the facility; some of these will be close to continuous in implementation, and others will be either scheduled or un-scheduled (as needed)**

- **Continuous Commissioning Process activities are on-going for the life of the facility**
- **On-Going Commissioning Process activities occur throughout the life of the facility; some of these will be close to continuous in implementation, and others will be either scheduled or un-scheduled (as needed)**

Re-Commissioning

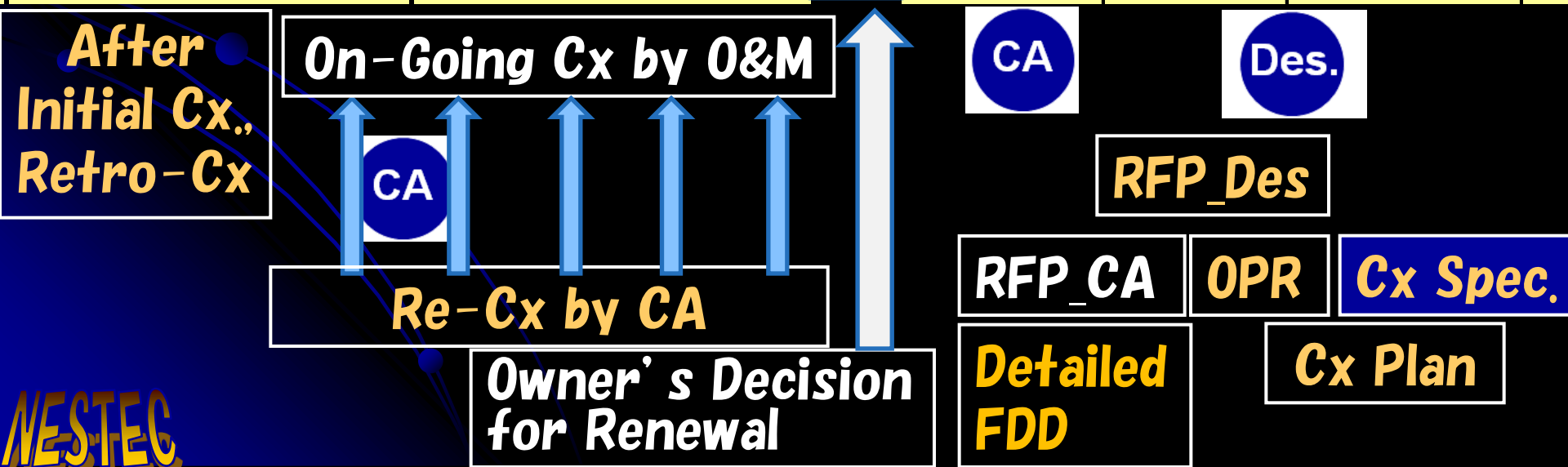
- **Re-Commissioning: An application of the Commissioning Process requirements to a project that has been delivered using the Commissioning Process. This may be a scheduled re-commissioning developed as part of an On-Going Commissioning Process, or it may be triggered by use change, operations problems, or other needs.**

Continuous Commissioning for Existing Buildings

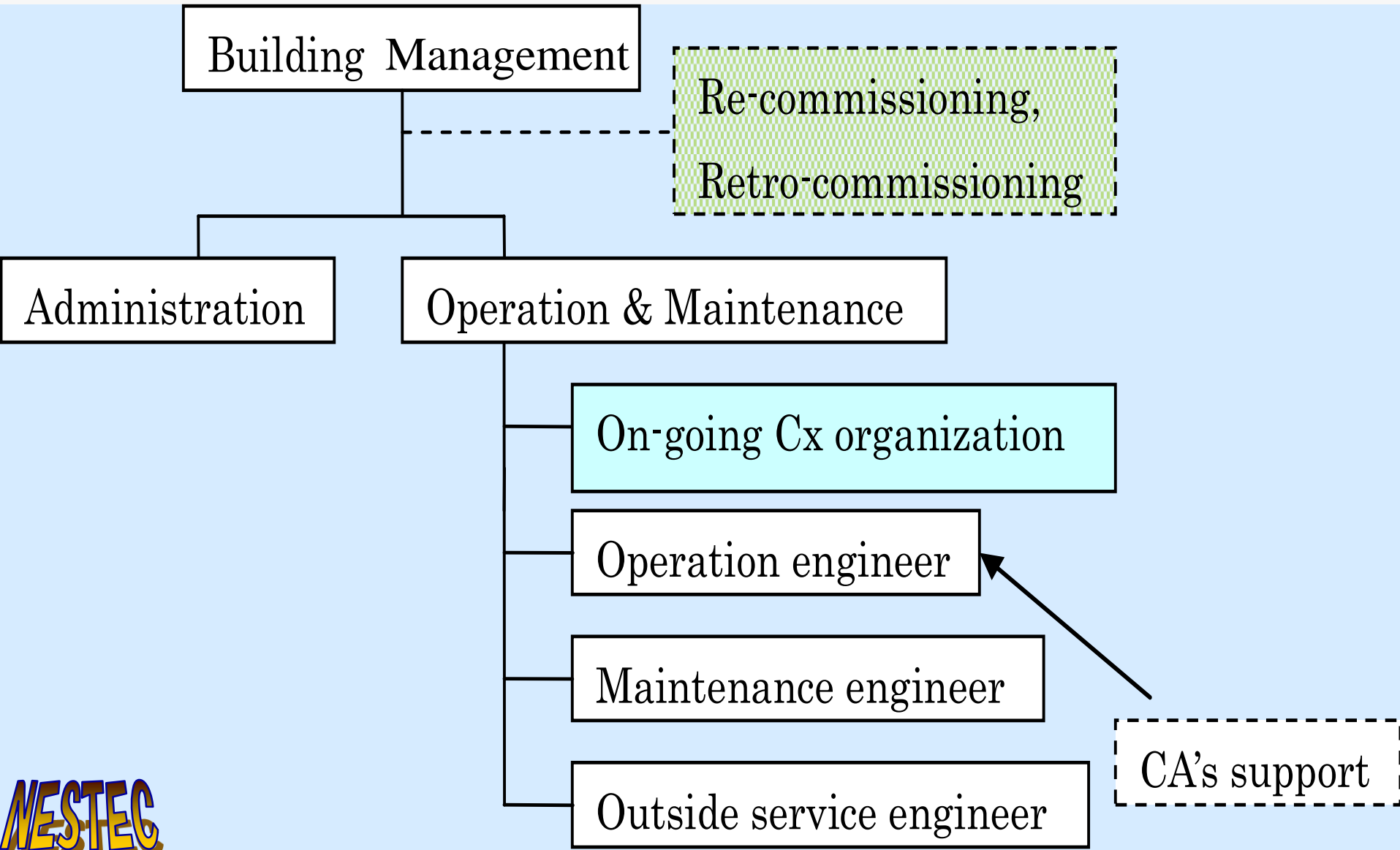
Follow Initial Cx Process

Renewal Process

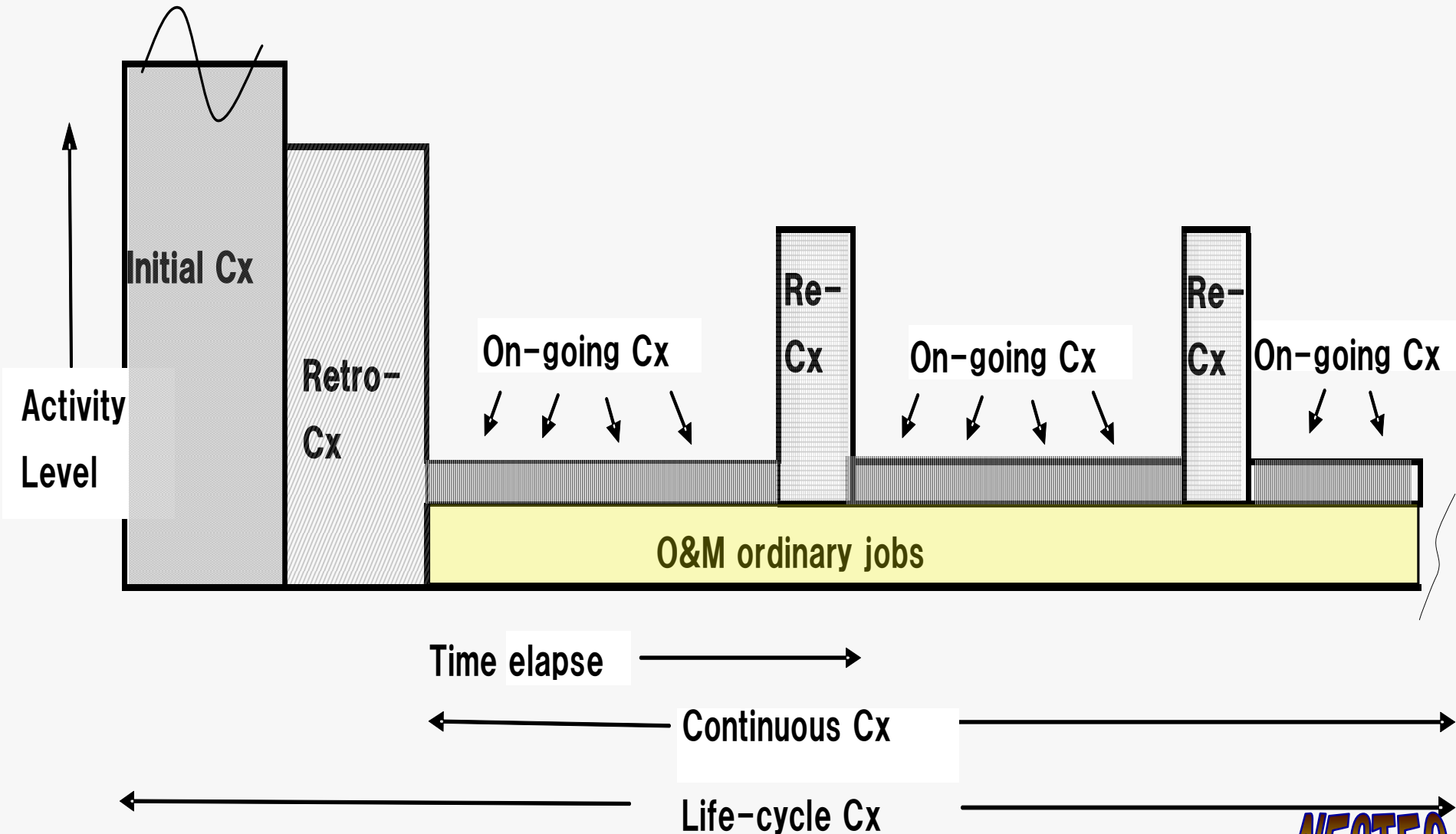
Operation and Maintenance Stage		Pre-Design Stage			
(Occupancy & Operation Phase)		Program Phase (Pre-Design Phase)		Design Phase	
Post-Acceptance Step	Post-Post-Acceptance Step	Program Step	Planning Step	Preliminary Design Step	Final Design Step



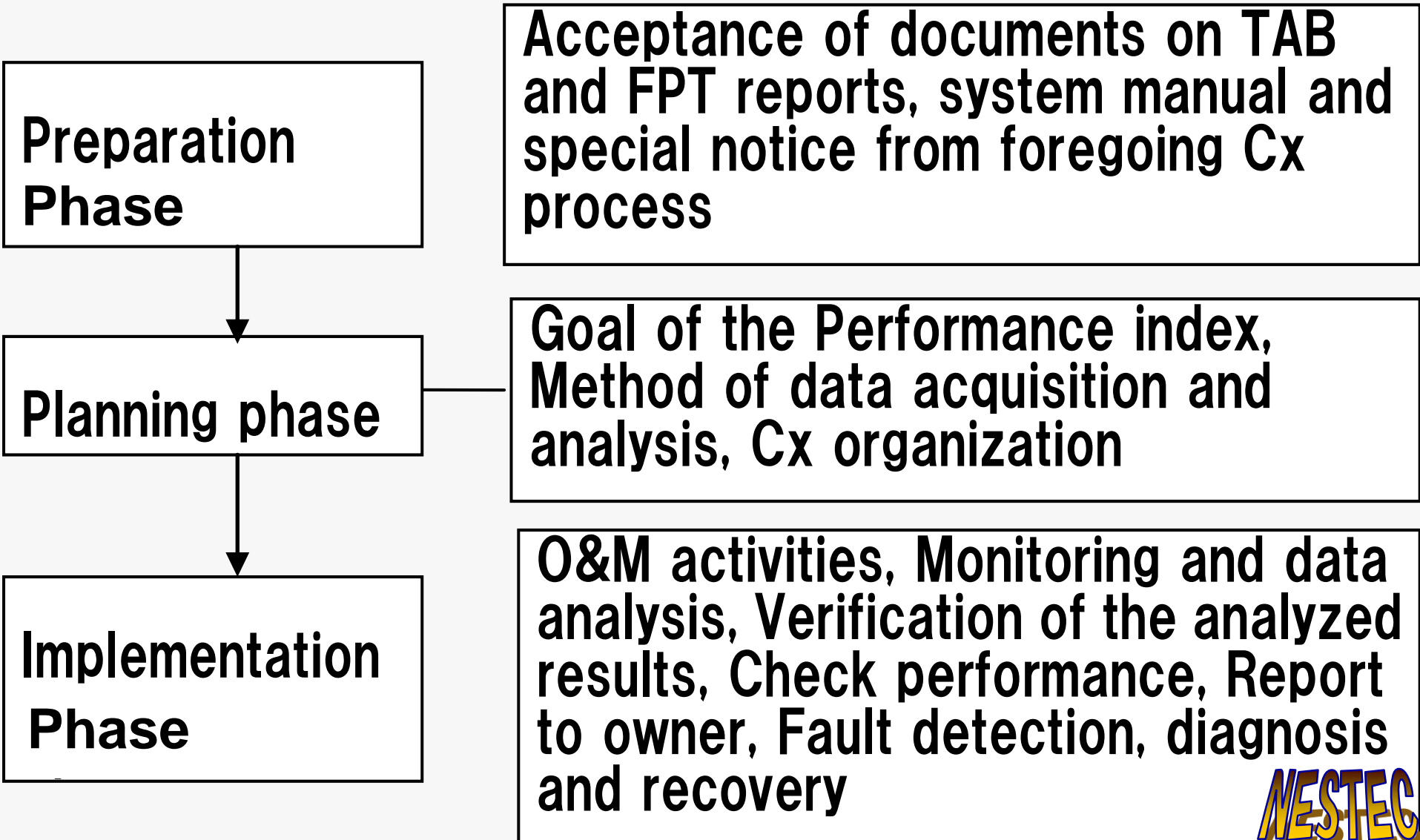
O&M's Organization for Building Services Systems



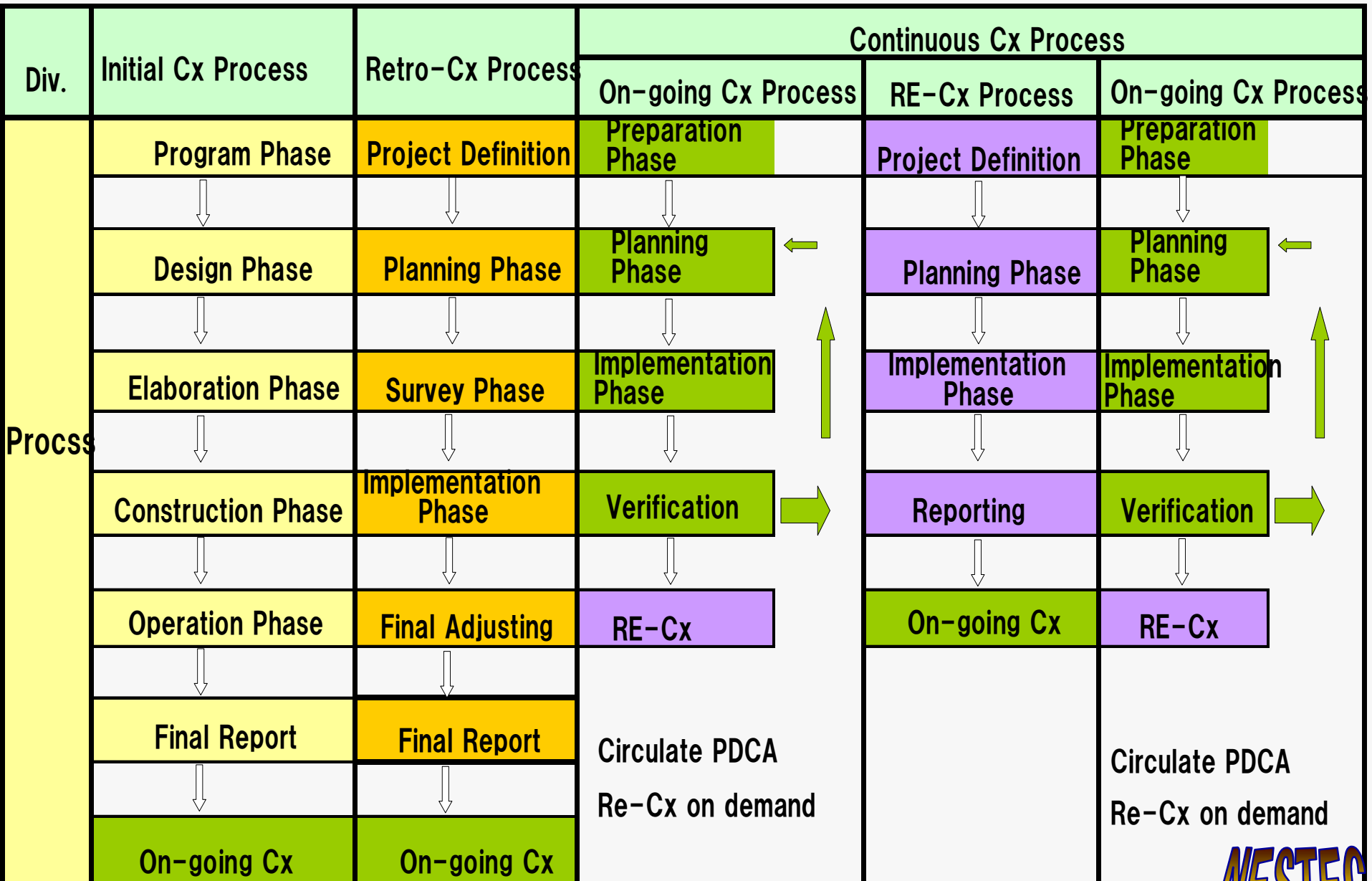
Relation among Commission Types and Structure of Continuous Cx



On-going Commissioning Process Phases



Life-cycle Commissioning



BOFDD

BO

**Building
Optimize**

**Diagnose
Bldg. & Systems**

**Dissatisfied
Energy / Environment**

**Performance Function
and Constraints**

OC

Optimization

Optimal Control

In-optimal

Parameter prediction

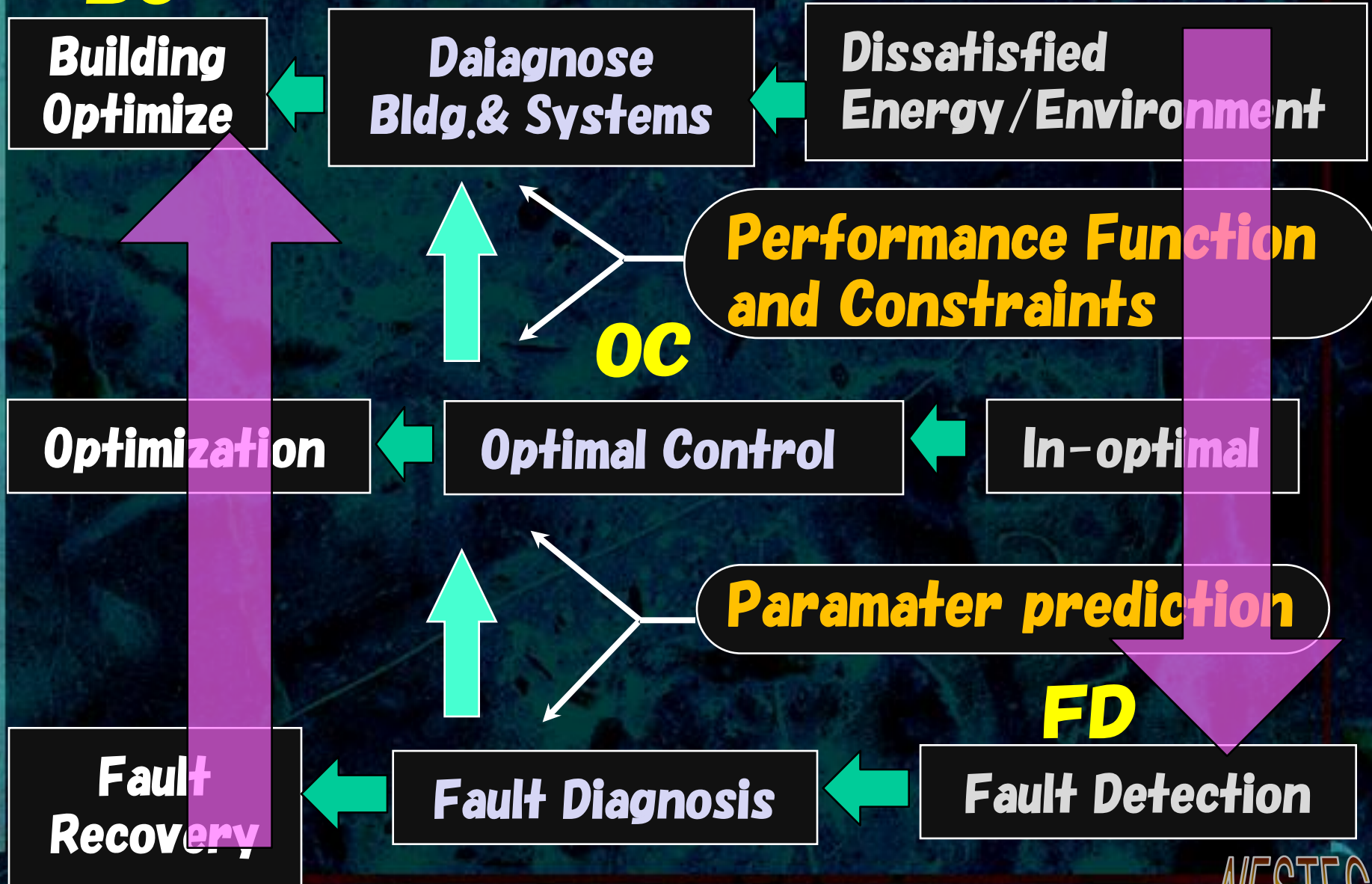
FD

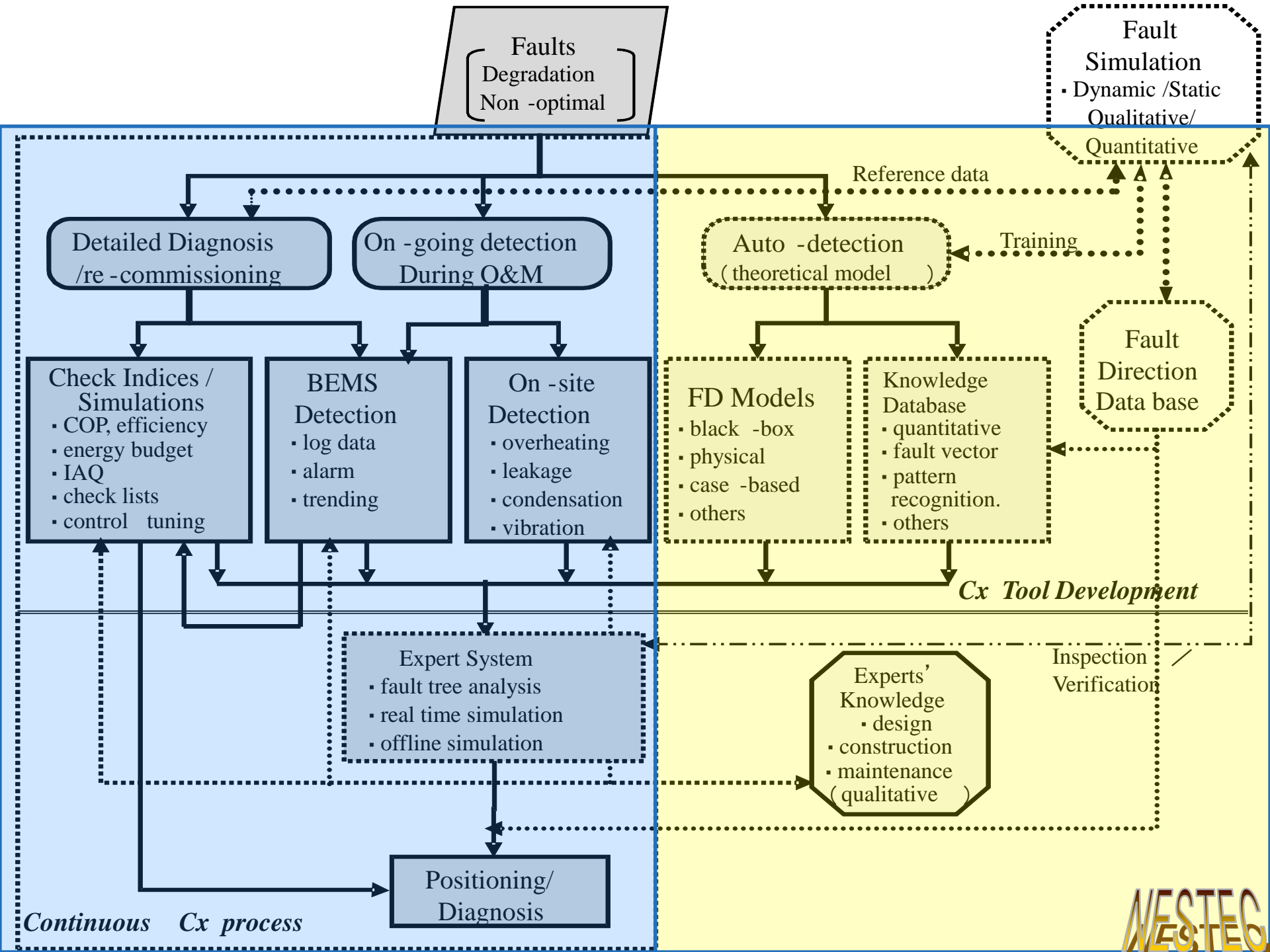
**Fault
Recovery**

Fault Diagnosis

Fault Detection

NESTEC

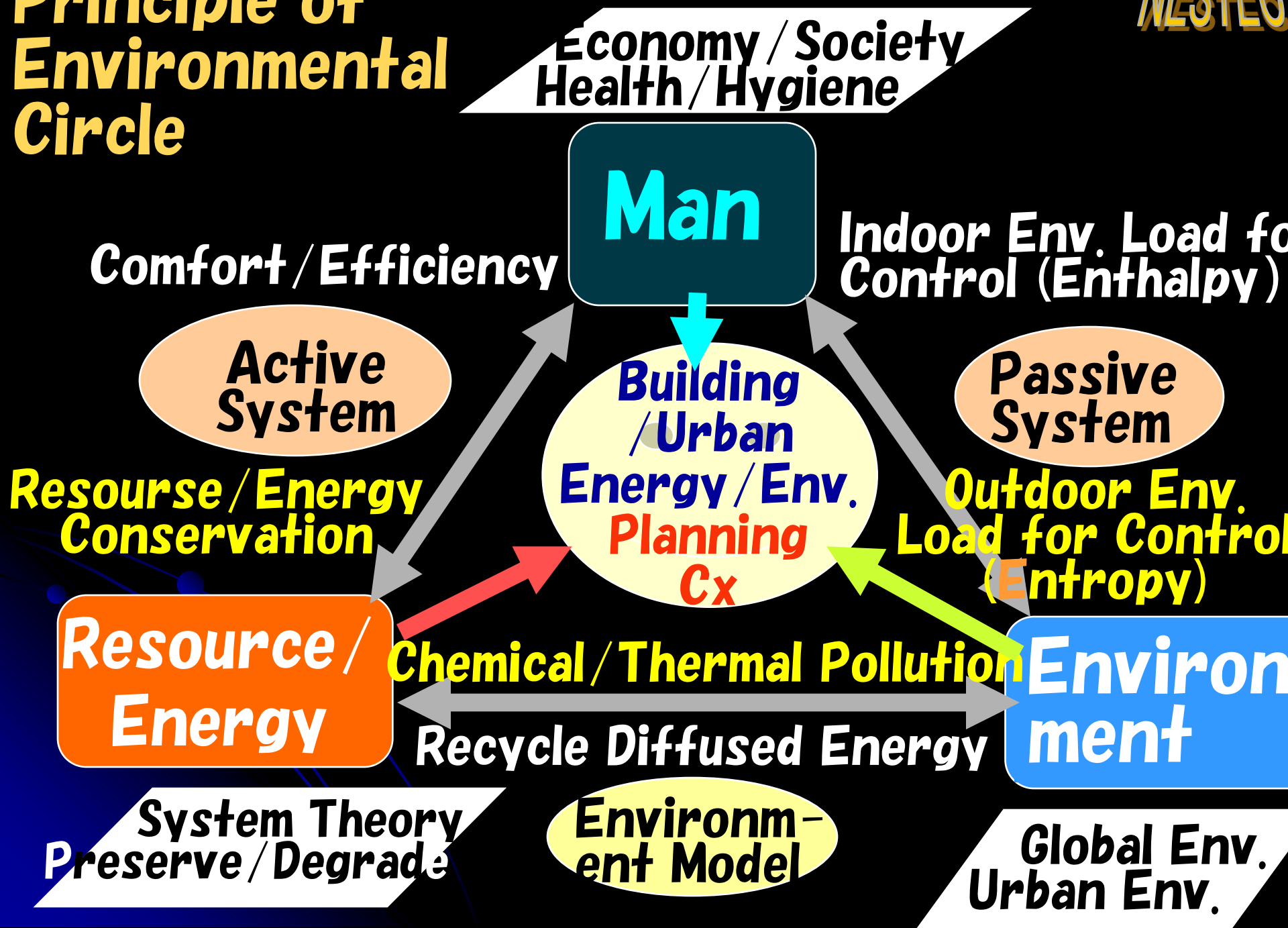




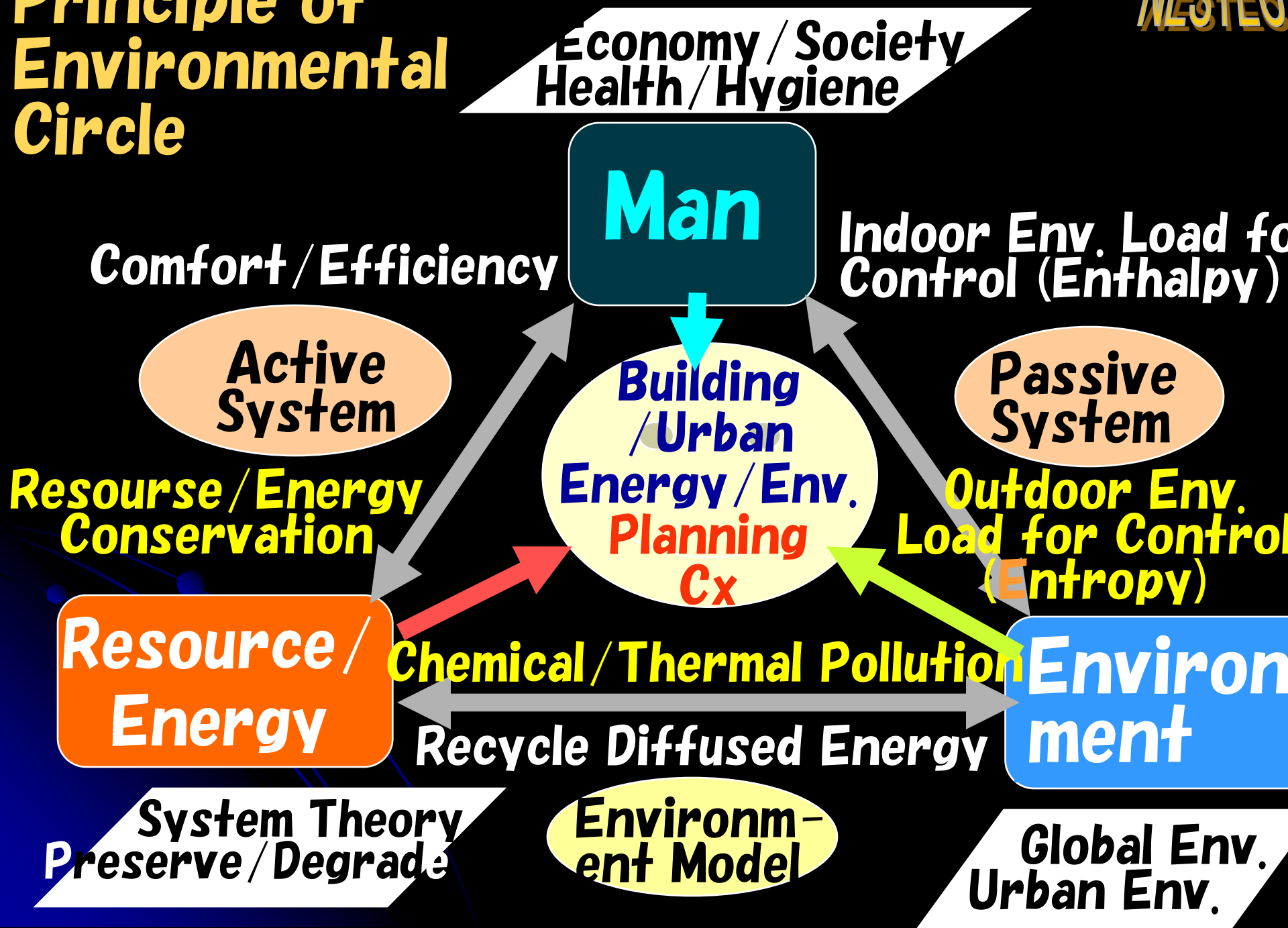
Conclusions

- **Continuous Cx is newly defined as the combination of on-going Cx and re-Cx, supplementing each other with close data exchange through commissioning reports.**
- **On-going Cx is defined as O&M's activity**
- **Re-Cx was defined as on-demand Cx by CA.**
- **The new definition will give O&M staff a strong motivation for their jobs in contribution to energy saving and global environment, but with fair payment.**
- **However, initial Cx to be followed by continuous Cx, which constitutes life-cycle Cx, is most desirable to achieve the global goal for energy conservation.**

Principle of Environmental Circle



Principle of Environmental Circle



**Thank you
for your kind attention!**

See you at the Fourth meeting.

