ICEBO/APCBC
Asia Pacific Conference on Building Commissioning
2006.11.7
Opening Address

Energy/Environment/Commissioning

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Proceedings of the Sixth International Conference for Enhanced Building Operations, Shenzhen, China, November 6-9, 2006
Call for participation to
International Conference
for Asia Pacific at NCBC 2006

- Asia Pacific Conference on Building
  Commissioning, APCBC has been planned to kick-off in Shenzhen in Nov. 6-8, 2006, together with
  - Annex 47, IEA/ECBCS
  - ICEBO 2006

- HKBCxC, Hong Kong Building Commissioning Center, is to co-sponsor and other bodies from mainland
  China and Asian countries are expected to participate.

- Commissioning bodies such as PECI, BCA, etc. in USA are desired to participate in this
Actual and Estimated Energy Demand in the World

Equivalent Oil Million ton

- Africa: 21%
- Middle East: 15%
- M. & S. America: 9%
- Asia, incl. Jpn. & Korea: 16%
- China: 15%
- Former USSR: 9%
- OECD, excl. Jpn. & Korea: 36%

From IEA/World Energy Outlook 2004
Energy-originated CO₂ in the World

From data
Origin of CO2 generation in Japan,
A third comes from Building sector

5.2% Residential building construction
5.6% Non-residential building construction
1.3% Repair
12.5% Residential building operation
11.4% Non-residential building operation

63.9% Other industrial Sector

1.2 billion ton-CO2/a

1990年産業連関表等を利用した推計値（伊香賀推計）
Four Principles of Reformmation of Building, Town and Globe

- Environmental Circle Principle
- Energy Conservation Principle
- Commissioning Principle
- Evaluation Principle
How Building & Urban Energy System shall be completed and maintained?

- Mechanism of Urban Environment State Change
  - Virtual/Vicious Circle of Man-Environment-Resourse/Energy

- Principle of Energy Conservation

- Recognize the Big Effect of Commissioning Process from Program to Maintenance

- Proper and Unbiased Evaluation System for Energy / Environment / Sustainability
Energy Conservation Principle

- Reflection
- Deliberation
- Limited Ener./Resour.
- Energy Use Pattern
- Global Env.
- Urban Environment
- Save
- High Efficiency
- Renewable Energy
- Energy Recycle
- Proper Evaluation
- Demand Control
- Optimization
- Humanism
- Maintenance/Moral
Commissioning Application

- Life Cycle Commissioning
- Initial Commissioning
  - Total Initial Commissioning
  - Partial Initial Commissioning
    - Ex1: Acceptance Step Commissioning
    - Ex2: Program Phase Commissioning (Consulting)
    - Ex3: Construction Phase Commissioning
- Retro Commissioning
- Continuous Commissioning
What is Commissioning (Cx)?

--- Process definition

The process to accomplish the real Owner’s Project Requirements through building construction stage and continuing to operation and maintenance stage as the life-cycle process.

--- Global definition

Commissioning is performed in order to keep the system in optimal condition through the life of the building from the viewpoints of environment, energy and facility usage.
Who manages Cx Process?
Commissioning Authority (CA)

CA shall be

- nominated and paid directly by owner,
- individuals or organizations which are socially acknowledged as a bearer of fair mind with sufficient professional knowledge and management capability,
- the third personality concerning the project in concern
- preferably, standing-alone professional independent from design team and construction team
<table>
<thead>
<tr>
<th>Comissioning phases</th>
<th>Production Stage</th>
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<tbody>
<tr>
<td><strong>Program Phase</strong> (Pre-Design Phase)</td>
<td><strong>Design Phase</strong></td>
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<td>Program Step</td>
<td>Planning Step</td>
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<td>RFP_CA</td>
<td>RFP_Des</td>
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<tr>
<td>Production Stage</td>
<td>Operation &amp; Maintenance Stage</td>
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<tr>
<td>Construction Phase</td>
<td>Operation Phase (Occupancy and Operations Phase)</td>
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<tr>
<td>Construction Step</td>
<td>Post-Acceptance Step</td>
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<tr>
<td>Acceptance Step</td>
<td>Post-Post-Acceptance Step</td>
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</tbody>
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- **Construction Doc.**
- **TAB**
- **Cx Plan_update**
- **Syst. Manual**
- **FPT**
- **Season. FPT**
- **Train. /edu.**
- **Final Cx**
- **Re-Cx, On-going Cx Stage**
- **Report**
Evaluation System of Sustainable Building
LEED-NC 2.2 Prerequisite 1:
Fundamental Cx of Building Energy Systems

- Designate an individual as the Commissioning Authority (CxA) to lead, review and oversee the completion of the commissioning process activities.
- The Owner shall document the Owner’s Project Requirements (OPR)
- Develop and incorporate commissioning requirements into the construction documents.
- Develop and implement a commissioning plan.
- Verify the installation and performance of the systems to be commissioned.
Comprehensive Assessment System for Building Environmental Efficiency

CASBEE (Japan)

Realize Buildings with better Q&P
emitting less Environmental Load

Environmental Quality, Performance

Q (Quality)

Environmental Load

L (Load)

BEE = BEE (Building Eco Efficiency)

Imaginary boundary

Site boundary
グリーンオリンピック建築研究チーム著： 清華大学（江教授、秦教授、朱教授ほか）
+ 北京市持続的発展科学技術促進センター（藤センター長ほか）+ 中国建築科学研究院
+ 北京市建築設計研究院 + 中国建築材料科学研究院 + 北京市環境保全科学研究院ほか
伊香賀俊治（慶応大）
Merit of Commissioning
For Building Owners:
- Building truly match Owner’s requirements
- Realize High Quality Products and Maintenance
- Contribution to Facility Management
- Obtain Cost Efficient Building through Lifecycle
- Satisfactory Room Environment
- Added Value to Real-estate
- Reasonable rent
- Satisfaction through Energy Conservation
Merit of Commissioning

For Design Professionals:

- Raises Quality of Design
- Clarify Roles and Responsibility of Designers
- Economical Merit
  - Fair amount of fee deserving its quality
  - Reduced Troubles
  - Cost Effective Design
- Raised Fame as Design Professional
- Act as CA based on their experience
Merit of Commissioning

For Contractors:

- Clarify Scope of TAB
- Reduce Troubles during Construction and after Occupancy
- Economical Merit
  - Clarified Scope and Responsibility for TAB and Cx-related Works
  - Reduce Risks for Trouble Solution Expense
  - Clearly define Fee for Design Support Works
- Clearly define Acceptance Procedure
- Act as CA based on their experience
Merit of Commissioning

For O&M Engineers:

- Earlier Participation to Cox Team Process
- Improved Maintainability
- Improved System Documentation to Operate
- High Quality Accepted Systems through Complete TAB, FPT process
- Acceptability to Instruction and Guidance by CA as Consultant
- Improved Status of O&M assisted by Deepened Knowledge and Improved Working Environment
World Commissioning History World/Asia

**Asia**

- 1970s Cx Activ. started, USA
  - CIBSE Code on Cx
- 1979 ASHRAE Symp. on TAB
- 1988 First SIBSE Code in UK
- 1989 First AHRAE Cx Guide
- 1991 Annex25, BOFD
- 1993 First NCBC held, PECI
- 1995 Annex34, BOFD Demo
- 1996 ASHRAE New Cx Guide
- 1999 BCA (US) established
- 2000 Annex40, HVAC Cx
- 2003 UK Cx Code M issued
- 2005 ASHRAE/NIBS Cx Process
  - 200X-0
  - Annex47, Retro-Cx, etc
- 2006 ICEBO 2006

1980s (HK) TAB/Cx Activity started

- 1987 (J), First introduction of Cx
- 1991 (J,C) Annex25
- 1995 (J,HK) Annex34
- 1997 (J) Cx Activity started
- 1998 (J) First Cx Guide Draft
- 2000 (J,HK) Annex40 participation
  - (J) First Application of I
- 2003 (TW) TAB/Cx began to work
- 2004 (J) BSCA established
- 2005 (J) Cx Guideline issued
- 2006 APCBC 2006 11 (Shenzhen)
Thank you for your participation