Industry's Perspective of Design for Safety Regulations

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CIB W099 Conference

Working Together: Planning, Designing and Building a Healthy and Safety Construction Industry

Melbourne, Australia
October 21-23, 2009

Prevention through Design (PtD)

- "Addressing occupational safety and health needs in the design process to prevent or minimize the work-related hazards and risks associated with the construction, manufacture, use, maintenance, and disposal of facilities, materials, and equipment."

PtD™ Prevention through Design

NIOSH National Institute for Occupational Safety and Health

(http://www.cdc.gov/niosh/topics/PTD/)

Implementing PtD in Construction

- Why design for construction safety?
  - ✓ Connection between design and site hazards
  - ✓ Ethical responsibility
  - ✓ Ability to influence safety (hierarchy of controls)
  - ? Makes good business sense
  - ? Contractually obligated
  - ? Required by statute (some countries)
  - Other…

Research Study

- Assess the effects of the CDM regulations on the construction industry in the UK
  - Affect of CDM regulations on:
    - Design, construction, and safety
    - Perceptions of safety, roles on the project, and organizational and professional culture
    - Management of projects
  - Presence of innovative processes and products

Research Study

- Focus group interviews
  - 6 professional "communities":
    - Architects, design engineers, facility owners/developers, constructors, manufacturers/suppliers, and H&S consultants
  - 13 focus group interviews
  - Total of 61 participants in interviews
    - Experience with CDM regulations: 1-18 years (mean = 11.1)
    - 46% from firms with >1,000 employees
    - 26% H&S consultation, 22% project management, 20% construction, 18% engineering, and 14% architecture
    - Industry sectors: 36% commercial, 35% industrial, 29% infrastructure, and 28% residential

Results: What is done differently now?

- Changes since introduction of CDM regulations:
  - More safety notes/symbols on drawings
  - More pre-fabrication
  - More consideration of construction earlier in project
    - Safety constructability, not just constructability
  - More paperwork!!
  - Designer change in perspective regarding safety
  - More communication/collaboration as a team
    - Causing them to "just do what they should do as professionals"
    - "This is the real driver. CDM was just the catalyst."

Results: Impact on Projects

- Change as a result of implementing PtD (% of respondents)

Item	Decrease	No Change	Increase
Design cost (n=35)	6%	46%	49%
Construction cost (n=38)	34%	24%	42%
Design duration (n=37)	8%	57%	35%
Construction duration (n=39)	38%	44%	18%
Construction quality (n=39)	8%	28%	64%
Construction worker productivity (n=30)	13%	33%	53%
Construction worker health & safety (n=45)	4%	9%	87%
End-user health and safety (n=42)	5%	10%	86%

Results: Barriers and Enablers

- Barriers:
  - Designer education and training
  - Difficult for designers to assess risks
    - Also differences in risk thresholds
  - Lack of knowledge of CDM regulations
  - Too much paperwork!!
  - Separation of design and construction
  - Competing priorities (safety vs. cost/schedule)
- Enablers:
  - Construction experience of A/Es
  - Integrated project delivery methods (e.g., design-build)
  - A good CDM Coordinator and early involvement

Results: Desired Changes

- Desires/Needs:
  - Less paperwork!!
  - Guidance on what designers should do in practice and what is better left up to the contractor
  - Improvements in safety and design culture
  - Make CDM Coordinator a more "professional" position, on the same level as the A/E

PtD Regulations: Issues to Consider

- Issues/concerns:
  - Small projects vs. large projects
  - Involvement/impact depends on industry sector
  - On some projects:
    - Just "doing the paperwork" (depends on CDM Coordinator)
    - Alienating designers instead of engaging them
  - Focus on "commercially practicable"
  - Just documenting the risk and managing it as usual?
    - Minimal pushing of interventions up the hierarchy of controls
  - Designing for operations and maintenance safety viewed as satisfying CDM regulations?
    - Construction safety still "passed on" to contractor

PtD Regulations: Issues to Consider

- Issues/concerns:
  - "Whatever I do won't help."
  - Planning Supervisor credibility
  - Design already optimized on standard projects?
  - PtD message lost amid need to meet CDM regulations
  - Where does designer's responsibility end?
  - By doing PtD, is there now less of a need to do downstream risk management?
    - Yes and No
  - If no CDM, then PtD would not happen?
    - Yes and No

Thanks for Listening

- Questions? Comments?

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