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Findings from the Overall PtD in UK Study and Their Application to the US

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Professor, School of Civil and Construction Engineering, Oregon State University
Background

- Initial vision: Richard Rinehart, NIOSH

- Part of NIOSH NORA PtD study
  - Project 1 – Benchmarking Management Practices related to PtD in the US and UK
    - Activity 2: Assess the Effects of PtD Regulations on Construction Companies in the UK

- Collaborators
Specific Aims

- Objectives:
  - Identify expected organizational and industry impacts
  - Identify innovative processes and products that have evolved
  - Develop guidance for US
  - Disseminate findings to US construction industry

- Research to practice
Methodology

- Focus group interviews in the UK
  - Six professional “communities”
    - Architects
    - Design engineers
    - Facility owners/developers
    - Constructors (general and trade contractors)
    - Manufacturers/suppliers
    - Health and safety consultants
  - 14 focus groups / 110 participants

- Survey of UK construction industry
  - 258 responses / all targeted “communities”

- Additional activities
  - Sellafield case study
  - Australia interviews
<table>
<thead>
<tr>
<th>Issue</th>
<th>U.K.</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resources, tools, processes</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Project delivery methods</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Designer role on project team</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Designer ethics and traditional viewpoint on construction safety</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>PtD legislation</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Designer PtD education and training</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Designer PtD liability concerns</td>
<td>✓</td>
<td>✔</td>
</tr>
</tbody>
</table>

* UK: Liability for NOT addressing construction worker safety and health
US: Liability for addressing construction worker safety and health
What is Different Now?

- **Owner/client:**
  - Increased safety and health knowledge and involvement

- **Project team and culture:**
  - Increased team collaboration/communication
    - “CDM is causing them to do what they should do as professionals.”
    - “CDM was the catalyst, but the real benefits came from the other changes to comply with CDM.”
  - Safety and health now spread throughout project team, not just an add-on provided by the H&S coordinator
  - Change in perspective towards construction safety
Perspective of PtD

- Which statement best matches your overall attitude towards PtD?

- PtD is important and should be given greater importance: 122 responses
- Benefits are worth the effort to implement it: 56 responses
- Benefits are promising, but too many barriers: 14 responses
- Benefits are promising, but effort required is too great: 4 responses
- No recognizable benefits: 1 response
- No response: 53 responses
Perspective of PtD

What is your perspective towards PtD?

- PtD is a fundamental, moral imperative, not just a requirement from legislation (190 responses)
- PtD is only a requirement of legislation (7 responses)
- Other (6 responses)
- No response (55 responses)

# of Responses (Survey)
What is Different Now?

- **Design:**
  - Safety notes/symbols on the drawings
  - Increased modularization and pre-fabrication
  - Transparency of rationale for designs
  - More paperwork!!

- **Construction:**
  - Increased and earlier construction input in the project
  - “Safety constructability”, not just constructability
Impact of PtD

To what extent has PtD affected design and construction?

![Bar chart showing the impact of PtD on design and construction.](chart.png)

- Very positive impact: 76 responses
- Some positive impact: 128 responses
- No impact: 9 responses
- Some negative impact: 5 responses
- Very negative impact: 0 responses
- Don't know: 32 responses

Legend:
- Blue: Design
- Red: Construction
Impact of PtD

To what extent has PtD affected the architect’s and design engineer’s roles?

- Very positive impact
  - Architect: 26
  - Design Engineer: 49
- Some positive impact
  - Architect: 134
  - Design Engineer: 116
- No impact
  - Architect: 35
  - Design Engineer: 16
- Some negative impact
  - Architect: 1210
  - Design Engineer: 16
- Very negative impact
  - Architect: 1
  - Design Engineer: 2
- No experience
  - Architect: 36
  - Design Engineer: 13
- No response
  - Architect: 3234
  - Design Engineer: 3234
### Impact of PtD on project attributes (% of responses)

<table>
<thead>
<tr>
<th>Item</th>
<th>Decrease</th>
<th>No Change</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FG’s</td>
<td>Survey</td>
<td>FG’s</td>
</tr>
<tr>
<td><strong>Cost: Design</strong></td>
<td>5%</td>
<td>3%</td>
<td>45%</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>32%</td>
<td>15%</td>
<td>22%</td>
</tr>
<tr>
<td><strong>Total project</strong></td>
<td>--</td>
<td>15%</td>
<td>--</td>
</tr>
<tr>
<td><strong>Duration: Design</strong></td>
<td>8%</td>
<td>3%</td>
<td>55%</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>37%</td>
<td>17%</td>
<td>41%</td>
</tr>
<tr>
<td><strong>Total project</strong></td>
<td>--</td>
<td>12%</td>
<td>--</td>
</tr>
<tr>
<td><strong>Construction quality</strong></td>
<td>7%</td>
<td>0%</td>
<td>29%</td>
</tr>
<tr>
<td><strong>Construction worker productivity</strong></td>
<td>19%</td>
<td>7%</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Construction worker H&amp;S</strong></td>
<td>4%</td>
<td>0%</td>
<td>8%</td>
</tr>
<tr>
<td><strong>End-user H&amp;S</strong></td>
<td>4%</td>
<td>0%</td>
<td>9%</td>
</tr>
</tbody>
</table>
Additional Issues

- Project characteristics:
  - Size, complexity, industry sector
  - Design already optimized(?)

- CDM Coordinator:
  - More than just “doing the paperwork”
  - Engage, rather than alienate, the designer

- “Commercially practicable”

- More than just documenting and managing the risk as usual
  - Desire to push interventions up hierarchy of controls
  - PtD message amid requirements to meet legislation
Additional Issues

- Designers:
  - “Whatever I do won’t help.”
  - Responsibility: Where does it begin? Where does it end?
  - Risk perception and threshold

- By implementing PtD, is there less of a need for downstream H&S risk management?
  - Yes and No

- If no CDM regulations, would PtD happen?
  - Yes and No
Perspective of PtD

Would you practice PtD if...

- ...the CDM reg's never existed?
- ...the CDM reg's were abolished?

<table>
<thead>
<tr>
<th>Category</th>
<th>Not currently practicing PtD</th>
<th>Yes, as currently practiced</th>
<th>Yes, but differently</th>
<th>No response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Responses</strong></td>
<td>12</td>
<td>106</td>
<td>91</td>
<td>49</td>
</tr>
<tr>
<td><strong>Responses</strong></td>
<td>7</td>
<td>140</td>
<td>62</td>
<td>49</td>
</tr>
<tr>
<td><strong>Total Responses</strong></td>
<td>29</td>
<td>246</td>
<td>153</td>
<td>98</td>
</tr>
</tbody>
</table>
Desired Changes

- Less paperwork!!

- Need guidance on what designers should do and what is better left up to the constructor
  - How to optimize project team efforts for best results

- Make CDM Coordinator a more “professional” position on the same level as the A/E

- Improvements in construction safety and design culture
  - Demonstrate value to all participants
  - Make it “just part of what we do”
Importance of PtD

- How important is PtD to H&S compared to other H&S programs/processes?

![Bar chart showing the number of responses for different levels of importance.

- Insignificant: 5
- Less important: 20
- About the same: 107
- More important: 41
- Significantly more: 22
- I don't know: 8
- No response: 55

# of Responses (Survey)
Moving Forward in the US
Moving Forward in the US

1. Establish a solid foundation

- Culture
- Risk
- Organizational and Project Structure
- Physical Form and Function
- Resources, Tools, Processes
Moving Forward in the US

1. Establish a solid foundation

- Integrate PtD into designer education and training
- Promote value of designers to construction safety
- Establish expectation of all parties involved in safety
- Establish expectation of discipline integration and collaboration
- Incorporate PtD into sustainability practices
Moving Forward in the US

1. Establish a solid foundation

- Develop model contracts for design and construction that include PtD
- Develop model insurance policies that cover PtD liabilities
- Establish designer PtD responsibilities and expectations
- Educate and train designers about construction hazards and risks
Moving Forward in the US

1. Establish a solid foundation

- Promote integrated project delivery
- Engage owners/clients in PtD
- Establish designer PtD role on project team
- Augment and promote the role of a construction engineer
Moving Forward in the US

1. Establish a solid foundation

- Develop and disseminate safe designs
- Promote modularization
- Enable off-site pre-fabrication
- Develop automated construction technologies
Moving Forward in the US

1. Establish a solid foundation

- Develop model PtD review process and tools
- Incorporate PtD into design codes
- Develop design risk rating system
- Develop and disseminate PtD case studies
- Develop designer education/training resources
- Incorporate PtD and construction into PE licensure
Moving Forward in the US

1. Establish a strong foundation
2. Stand on the foundation
Basis for Change

- T.J. Hooper v. Northern Barge Corporation (60 F.2d 737), July 21, 1932

- B. Learned Hand, Circuit Judge, NY:

  “There are, no doubt, cases where courts seem to make the general practice of the calling the standard of proper diligence; we have indeed given some currency to the notion ourselves. Indeed in most cases reasonable prudence is in fact common prudence; but strictly it is never its measure; a whole calling may have unduly lagged in the adoption of new and available devices. It never may set its own tests, however persuasive be its usages. Courts must in the end say what is required; there are precautions so imperative that even their universal disregard will not excuse their omission.”
Thank you for your interest, and your commitment to PtD.

Questions? Comment?

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