PAS 1192-6 : 2018
Specification for collaborative sharing and use of structured Health & Safety information using BIM

An OVERVIEW

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Key Note

• Sponsored, Supported and Endorsed By
  Steering Group - AEC3; Arup; Association for Project Safety; Balfour Beatty; Chartered Institute of Architectural Technologists (CIAT); Construction Industry Council (CIC); Costain plc; Department for Communities and Local Government (CLG); EDF Energy; Environment Agency (EA); HSE; Ivan Hurst Consulting; Jacobs; MACE; Mott McDonald; National Grid; Structural Safety Ltd (SCOSS); TFL; The Public 500+ Foundation; i3AECOM; Premtech; JK; NBS; Berkeley; AECOM; AMEC; IHurstCon; plus guest contributors.

• BIM Level 2 - is an evolving definition – will be redefined - Steering Group sought compliance with 1192 suite and other standards - ISO 19650-1 & 2 – collaborative working over the Asset Lifecycle - PAS 1192-6 is about collaboration over the lifecycle – use and share - PAS 1192-6 is level 2 suitable

• Dovetails with CDM & MHSWR - UK is risk averse - identify, assess, mitigate, control – suitable and sufficient - PAS 1192-6 is about collaboration over the lifecycle – use and share - PAS 1192-6 is level 2 suitable

Appropriate Application

Specific to:
✓ the project
✓ own management systems

Proportionate to:
✓ nature of the works and risks
✓ scope of work

Strong on:
✓ participation
✓ inclusion

PAS1192-6 – the Origins

• UK Government BIM Strategy
  Strategy Paper for the Government Construction Client Group From the BIM Industry Working Group – March 2011 increase BIM take-up over a 5 year horizon to improve - cost, value and carbon performance

• CIC Building Information Model (BIM) Protocol – first edition 2013

• Construction Industry Council – BIM initiatives
  - Planning and Building
  - Software
  - Fire
  - H&S Legislation

• Early 2014 – HSE’s BIM 4 H&S working committee

• January 2016 – funding sought - obtained

• October 2016 – BSI project start
  Bhavisha Berry, BSI – Matt Blackwell, Costain
  Peter Nicholas, Arup – Nick Nisbet, AEC3
  BSI Steering Group – Gordon; Click and Savin; HSE

• February 2018 – PAS 1192-6 published
  500+ downloads first 3 days > 4,000 downloads first two months
Focus of Development

- Collaboration
  - using H&S and risk information in context
  - applying a risk information framework
  - right information right people right time

- Applicable to different
  - industries and cultures
  - contract, project and commercial strategies
  - project types, sizes and risks

**BASIC LIFECYCLE**
Initiate, Design, Construct, Commission, Use
Client, Designer, Constructor, Commissioner, End-User
principles applied appropriately

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**Applying the PAS - General**

- 4.1 Invocation
  - 4.2 Operation
  - 4.3 Risk Management

Client through the EIR ~ others through the BEP
each Participant adopts a H&S risk management strategy
identify – use – share > H&S information

**Risk Information cycle**

- Identify
- Use
- Share
- Generalise

progressive iterative sharing basis

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**PAS 1992-6 Structure**

- Prefixes, 1, 2 and 3 – normal document content
  - foreword, introduction, scope, references, terms & definitions

- 4 and 5 – Applying the PAS and Risk information cycle

- 6 – Participant implementation strategies

- 7, 8, 9 and 10 = Information requirements and Representation

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Key Principles

- **Effective Common Data Environment (CDE)**
  - enable sharing and use of H&S information
  - access to subsequent legitimate users – available / accessible / archive
  - requirement to embed H&S attributes ~ automated queries and manual interrogation

- **Strong focus on process that promotes Collaborative working**
  - inter-related strategies and processes – collaboration between people, roles, teams
  - I am a designer, what do I have to do?

- **Emphasis on commissioning – soft landings**
  - importance of build validation and functional verification
  - correct, required and pertinent information handed over for asset use ~ Inc CDM HSF

Key definitions

**Risk**
combination of the probability of occurrence of harm and the severity of that harm

**Elevated Risk**
risk whose information is shared because of its exceptional nature or raised level given the agreed mitigation and context of the project

The includes risks judged to:
- have potential consequence of single or multiple fatalities, life changing or serious injuries, long lasting detriment to physical health, mental health and well-being
- be not obvious to a competent and experienced participant or outside of normal expectations
- remain a concern because of its potential occurrence within the asset lifecycle

The definitions of Risk compliant with:
Risk Ranking Effectiveness

- Risks need to be filtered / ranked – properly & consistently
  - not a debate about where on the matrix
- Risk acceptance is complex – influences change
- Ranking changes – inputs, actions, decisions, mitigation – point in time
- Risk reintroduced through failures – mitigation, control

PAS 1192-6
examination of risk in context
consistent agreed matrix throughout ~ 5x5
sharing elevated risk

Key Points

1. Providing information - the Asset Need
2. Providing information - Known & Wanted
3. Preliminary hazard analysis & safety review
4. Design Risk Objectives
5. Design Plan - incl. design risk management
6. Collaborative design
7. Constructability reviews
8. Construction Planning
9. Commissioning
10. The End User

Expectations

- Client: enabler - requirements, sponsor, tone
- Designer: primary enabler - user, creator, mitigator, generator
- Contractor: primary provider - for use, facilitator
- Commissioner: user - plan, control, manage
- End User: user - SMS, RAs, SSoW
- set expectations, goals
- meet expectations
- ensure expectations
- deliver expectations
- verify expectations
- fulfil expectations, goals

Implementation

- Ensure clear data conventions - for inclusion and use
- Share context and elevated risks - in a consistent, re-useable and non-proprietary form
- Agreed mitigation to be included - and level of risk re-assessed

a) table/spreadsheet
b) COBie
c) BIM & project applications
4D with risk associated to location and activity

Opportunity

• Preliminary Hazard Analysis and Safety Review
  - the UCDRs – key decisions – the strategies
• Promote / convince the Investing Client of the benefits of H&S data
  - throughout the project lifecycle to the Value of the Asset
  - securing their investment / objectives / certainty
  - supporting explicit client CDM duties
• Build Asset & Information Asset – are both durable
  - connects clients to the benefits of BIM and H&S – not just the benefits of asset data
• Industry Knowledge Base
  - internal / external – body of knowledge
  
  Asset information requirements informs the EIR – informs EIR_{H&S}
  BIM_{H&S} = opportunities to inform and support the Asset & Project

   Client buy-in enables EIR_{H&S}

Compatibility – H&S and BIM

• H&S does not require compatibility with any BIM level
• H&S is a UK legislative requirement – compliance at all times
• UK is risk averse
  - identify, assess, mitigate, control – suitable and sufficient

• H&S will benefit from BIM applications and processes
• Project risk / Asset risk
  - identify, assess, mitigate, control – accepted level of risk
  - right H&S information to the right persons at the right time
• H&S will benefit from BIM outputs
• Communication effectiveness – 7% verbal / 38% vocal / 55% visual > visualisations / models

  good H&S > without - BIM - with > H&S better

Opportunity

• more collaborative
  – share early and share often
  – development of consensus and understanding
• more efficient
  – standard formats and representations
  – standard tools and methods
• more visible
  – integrated into documents, 2D drawings and 3D models
  – opportunities to exploit 4D: integrated BIM and construction program
• more reusable knowledge
  – build-up of corporate capability
  – potential for industry-wide knowledge bank

  - - - through BIM_{H&S}
Thank you

Nick Nisbet, AEC3 – co-author
Gordon Crick, HSE – and Working Group
BSI Steering Group

improving health and safety outcomes through the use of BIM
bring to life the benefits of BIM in practice

http://bim-level2.org/standards?utm_source=social&utm_medium=web&utm_campaign=BIM+Level+2+Website