



JCCS Expert Task Group on Robustness

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CONTENTS



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- The Task Group
- The contents of the Guidance Document on Robustness

1. The JCSS Robustness Task Group



- An outcome of
 - JCSS/IABSE International Workshop on Robustness
 - 28-29 November, 2005 at BRE
- TG formed on 25 April 2006
- Develop International Guidelines Related to Robustness of Structures (Target July 2008)

2. JCSS Expert Task Group - Members



1. **Dr T.D. Gerard Canisius (Scot Wilson). Chairman**
2. **Prof. Michael Faber (ETH, Zurich)**
3. **Prof. John Sorensen (University of Aalborg, Denmark)**
4. **Mr Geoff Harding (formerly of DCLG, UK)**
5. **A. Maitra (Faber-Maunsell, UK)**
6. **R. Shipman (CLG, UK)**
7. **Prof. A. Vrouwenwelder (TNO, The Netherlands)**
8. **Prof. Bruce Ellingwood (Georgia Tech, USA)**
9. **Prof. Thomas Vogel (ETH, Zurich)**
10. **Dr John Menzies (Private Consultant)**
11. **Dr Fahim Sadek (NIST, USA)**
12. **Dr Finn Sorensen (Denmark)**
13. **Dr Jack Baker (Stanford University, USA)**
14. **Prof. Milan Holicky (Klockner Institute, Czech Rep.)**



- **Observers**
 - Prof. Haig Gulvanessian (BRE)
 - Prof. Carmen Andrade (IETCC, Spain)
 - Dr Inger Kroon (COWI, Denmark)
 - Prof. A. Scherer (Univ. of Dresden, Germany)
- **First Meeting – 5th July 2006 (BRE)**
- **Second Meeting – 23rd November 2006 (Munich)**

3. The JCSS Guidance Document:



‘Provision and Assessment of Structural Robustness’

The objective:

To provide international state-of-the-art guidance on robustness issues

By covering methods of

- quantifying,
- assessing and
- providing robustness,

and

incorporating latest international thinking and knowledge.



The document directed more at

- Regulators
- Code Developers
- R & D personnel

- Can be used by practising engineers

Scope

- On-shore and near-shore structures, but not off-shore structures
- Common structures (common rules & methods) & special structures.



CONTENTS

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1. Introduction
 2. Philosophy and Principles of Robustness
 3. Public Perception Issues
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1. Hazards
 2. Consequences
 3. Definition of Structural Systems
 4. Quantification of Robustness
-
1. Methods of Providing Robustness
 2. Decision Making
 3. Designing for Robustness
-
1. Effects of Quality Control and Deterioration on Robustness
 2. Other Issues
 3. Recommendations
 4. Annexes

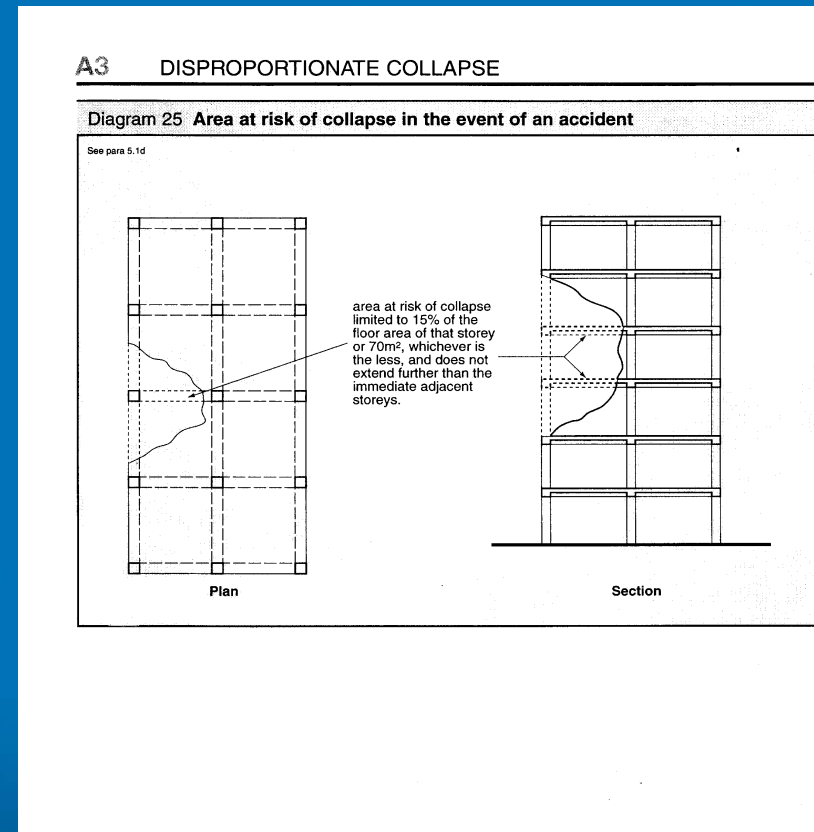
4. Contents (12 chapters)



Chapter 1: Introduction

Chapter 2: Philosophy and Principles of Robustness

- A preamble, with historic approaches
- Stakeholder requirements, especially in terms of existing practice and regulations



- **Chapter 3: Public perception of robustness issues**
 - Nature of structural safety
 - ‘tolerable risks’
 - risk communication
 - risk acceptance
 - stakeholder participation in decision making
- **Chapter 4: Hazards**
 - those considered by Regulations and codes
 - those not considered (including terrorist attacks)





- **Chapter 5: Consequences**
 - methods of quantifying consequences (human, structural, economical, political)
 - methods of expressing risks
 - proportionate consequences
- **Chapter 6: Definition of structural systems**
 - from components to complete structures
 - inclusion of hazards and consequences in a system
 - sub-systems

Chapter 7: Quantification of robustness



- what is robustness?
- can we quantify numerically?
- Can we help to compare two structures or solutions

Chapter 8: Methods of providing robustness

- How to make a system robust
 - Control of hazards
 - Good structural forms (topology) and properties (energy absorption)
 - Redundancy, stronger components
 - Inspection and maintenance

Chapter 9: Decision making

- Strengthening costs vs accepting risks
- Regulations
- Optimisation
- Legal issues
- Dealing with public perception issues

Chapter 10: Designing for Robustness

- Framework for designing for robustness, considering
 - **Hazards** (prevent, control, compartmentalise)
 - **Structure** (strength, redundancy, energy absorption, maintenance)
 - **Consequences** (escape time & routes, contingency plans, emergency services)
 - **Risks** (Control/Minimise, Acceptable risk, Constraints)

Chapter 11: Effects of quality control and deterioration on robustness



- **Gross Errors**
- **Material quality and fabrication errors.**
- **Importance of maintenance.**
- **Prevention.**





- **Chapter 12: Other issues**
 - Robustness during construction.
 - Existing structures
(The same principles apply)
- **Chapter 13: Recommendations**
- **Annexes**

Summary



- The JCSS has formed an Expert Task Group on Robustness of Structures.
- The TG will produce a Guidance Document ***Provision and Assessment of Structural Robustness***
- The document, we believe, will be a major step forward.
- We can look forward to it in the near future.

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Thank you.