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This circular is	<b>For information</b>	No response required	
This circular is	<b>Not relevant to the National Framework</b>		
Status	<b>To disseminate the findings from research. This circular announces the publication of five research reports.</b>		

# Building Disaster Assessment Group - Research Findings

## Issued by:

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**Research and Statistics Division**

## Addressed to:

**The Chair of the Fire and Rescue Authority  
The Chief Executive of the County Council  
The Clerk to the Fire and Rescue Authority  
The Clerk to the Combined Fire and Rescue Authority  
The Commissioner of the London Fire and Emergency Planning Authority  
The Chief Fire Officer**

## Please forward to:

## Summary

This circular informs of research completed under the auspices of BDAG. Reports in three areas are published on the CLG website today: one on the core temperature and physiological responses of firefighters to redeployment, one on the core temperature and physiological responses of firefighters to USAR work and a study in three sections into radio communication on the incident ground.

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### 1.0 Background

1.1 The Building Disaster Assessment Group (BDAG) was established to consider the issues for Fire and Rescue Authorities and their Fire and Rescue Services in the UK that were highlighted by the World Trade Centre incident of 11 September 2001. The terms of reference of BDAG are:

“To consider the potential implications, for the UK Fire and Rescue Service (FRS), of terrorist activities within the built environment, taking into account fire authorities’ responsibilities for ensuring the provision of appropriate fire precautions for buildings in use and safe operating procedures that reflect building design.”

1.2 Fire and Rescue Services were informed of the BDAG initial research reports by Fire and Rescue Service Circular (FRSC) 55/2004 and this Circular should be read with reference to FRSC 55/2004.

1.3 Since the initial reports BDAG has commissioned further research in several areas and is publishing the following reports:

- Physiological assessment of firefighters undertaking Urban Search and Rescue. (Fire Research Technical Report 17/2008)
- Core temperature, recovery and re-deployment during a firefighting, search and rescue scenario (Fire Research Technical Report 18/2008)
- Incident ground communications study. Published in three reports
  1. Current Situation Report (Fire Research Technical Report 19/2008)
  2. Technical Report (Fire Research Technical Report 20/2008)
  3. Final Report (Fire Research Technical Report 21/2008)

### 2.0 Research Reports

2.1 The Division publishes its research on CLG’s website and these reports are found at

<http://www.communities.gov.uk/fire/researchandstatistics/fireresearch/buildingdisasterassessment/>

### 3.0 Incident Ground Communications Study

3.1 This study’s aim was ‘to review the current level of knowledge and understanding of the forms of communications infrastructure available in the built environment and the requirements for effective communications on the incident ground within the UK’.

3.2 The reports provide evidence of the current provision of incident ground communications amongst Fire and Rescue Services (Current Situation Report), discuss the possible future provision of radio communication equipment (Technical Report) and bring the information together in a final report to inform the continuing discussions on securing effective communication at incidents.

- 3.3 The final report discusses possible methods of providing future FRS radio incident ground communications and makes recommendations as to progressing to secure them effectively.
- 4.0 **Core temperature, recovery and re-deployment during a firefighting, search and rescue scenario**
- 4.1 Following the initial BDAG research a need was identified to investigate the effect on the inner core body temperature response of Fire and Rescue Service personnel when they are re-committed to an operational physiologically demanding task following a previous such commitment. A study was therefore carried out to compare core temperature response readings following initial deployment, and re-deployment after varying rest and recovery intervals, in both ambient conditions and a fire scenario.
- 4.2 The study found that there was no significant difference in the rate of rise of core temperature during the initial deployment and re-deployment and no significant difference in overall core temperature responses between initial and re-deployments.
- 4.3 A recovery period after an initial breathing apparatus wear, especially one continued to the operation of the low cylinder pressure warning whistle, is essential to allow core temperature levels to reduce.
- 4.4 Simple cooling strategies optimise the cooling process during recovery. These include the complete removal of outer PPE at the earliest opportunity, relocation to a cool, shaded place ideally with air movement, and the consumption of reasonable volumes of cool fluid.
- 4.5 The use of active cooling strategies, such as head and forearm cooling, will increase the rate of cooling and reduce the time needed for core temperature to decrease.
- 5.0 **Physiological assessment of firefighters undertaking Urban Search and Rescue**
- 5.1 Eighteen volunteers undertook a USAR trial, comprising a three-hour morning work bout carrying out a breaking and breaching exercise repeated in the afternoon separated by a 90-minute recovery period.
- 5.2 The research identified that the thermal and cardiovascular responses were sustainable using a fairly strict rotation protocol and relieving crews at a regular interval. The crews rotated out of the structure and partially relaxed dress during the time outside.
- 5.3 As a result of the physical exertion experienced during the morning bout participants reported greater subjective fatigue, thermal sensation and body discomfort during the subsequent afternoon bout. It is suspected, although not known, that this fatigue and discomfort would significantly impact on performance on subsequent days.
- 5.4 Voluntary rehydration amongst the participants, with liquids freely available, was insufficient to replace all of the fluid lost during the day. Personnel should be reminded of the need for adequate hydration. In general it is necessary to replace 150% of fluid lost through sweat.

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