Disaster Management at South African Academic Institutions and the Development of a Comprehensive Disaster Management System

Van der Linde, T.C.¹ & Jordaan, A.J.²

¹ Scientist, SRK Consulting, Pretoria, South Africa
² Director: DiMTEC, University of the Free State, Bloemfontein, South Africa
Focus of the Presentation

• Based on findings from a study done in 2006
• Study investigated Disaster Management at South African Academic Institutions

• Aim of Study
  – To Investigate levels of DM at South African Universities
  – To Recommend a Comprehensive DM System

• Presentation includes a brief discussion of methodology and findings of study
Introduction

• The Blessing and Curse of Theory and Definitions
  Disaster Management
  Emergency Management
  Disaster Risk Management
  Enterprise Risk Management
  Occupational Health & Safety

Disaster Management Act and Framework

Theory/Study Field ← Requirements
Introduction

• Disaster Management practitioners often focus on “Large-scale” Disaster Management (National, Provincial, Municipal)
• However, Disaster Management principles can be applied on “smaller scale” as well. (Neighbourhood, Area, Building)
• This paper includes some aspects of “small scale” disaster management.
Overview

• Aim of Study
• Nature of Academic Institutions
• Why Disaster Management at South African Academic Institutions?
  • Disasters (Incidents) at Academic Institutions
  • Impact of Disasters on Academic Institutions (Institution, City and Country)
• Concept of a Comprehensive Disaster Management System (CDMS)
  • The Disaster Management Cycle (and variations)
  • Comprehensive Disaster Management System in terms of Disaster Management Cycle
  • Basic Components of a Comprehensive Disaster Management System
• Results and Discussion
  • Disaster Management at South Africa Academic Institutions
    • Implementation of Activities
    • Disaster Management Rating
• Conclusion and Recommendations
• Remarks, Questions and Comments?
Why DM at Academic Institutions

Why bother?
Campus is a Safe Place?
Incidents at Academic Institutions

- **Seton Hall University, New Jersey, USA**
  - 19 January 2000
  - Fire in dormitory
  - 3 students killed
  - More than 50 injured
  - Two students admitted to set the fire
  - Sentenced to five years in a correctional facility
Virginia Tech, Virginia, USA

- 16 April 2007
- Shooting on Campus
- 32 killed
- Shooter committed suicide

Incidents at Academic Institutions
Incidents at Academic Institutions

• University of Stellenbosch – 2007
  – Fire in Student Residences
  – Damage to property
  – Relocate students
Incidents at Academic Institutions

• **University of the Free State – 2007**
  – Fire in Chemistry Building
  – Damage to property
  – Disruption to activities
  – Extensive Clearing of Hazardous Waste
Incidents at Academic Institutions

• **University of the Free State – 2008**
  – Student protest
  – Disruption to activities
  – Extensive Damage to Property
  – Impact on Reputation?
Problem Statement

- South Africa is vulnerable to a range of hazards, presenting risks to people and infrastructure.
- Similarly, Academic Institutions are also vulnerable to a range of hazards.
- These hazards pose a risk to ‘campus specific’ users, activities, resources and infrastructure (Students, staff, buildings).
- But, on-campus disasters can also (directly or indirectly) influence the host city, or province in which the institution is located.
Aim of the Study

• To determine to what extent South African Academic Institutions implement Disaster Management Activities

• To propose the minimum components of a “Comprehensive Disaster Management System” (CDMS) to be used by South African Academic Institutions.
Methodology

To determine to what extent South African Academic Institutions implement Disaster Management Activities
• Questionnaires to 22 Institutions
• Fax, Email, Postal
• Correspondence

To propose the minimum components of a “Comprehensive Disaster Management System” (CDMS) to be used by South African Academic Institutions.
• Literature Study
• Discussion with Role-players
Nature of Academic Institutions

• Mass gathering of people
  – Classes
  – Hostels and Residences
  – Sporting, Cultural and Social Events

• Mixed Land uses in Proximity
  – Academic (Classrooms, Laboratories)
  – Administrative (Offices, Conference Rooms)
  – Research (Laboratories)
  – Service (Workshops, Warehouse)
  – Commercial (Shops, Restaurants)
  – Recreational (Sport facilities, Gymnasium)

• Rapid Growth in Student Numbers
  – Limited budget
  – Unplanned expansion of campus environment
Nature of Academic Institutions

• Various hazards
  – Natural:
    • Flooding
    • Storms
    • Earthquakes
  – Human-Induced (Accidental or Deliberate):
    • Spill/Release: Biological, Chemical, Radiological
    • Fire/Explosions: Chemical
    • Crime: Against Person, Property
    • Sabotage and Terrorism
Concept of a Comprehensive Disaster Management System (CDMS)
Concept of a Comprehensive Disaster Management System (CDMS)

The Disaster Management Cycle (and variations)

Source: Disaster Management Guidelines for Municipalities (NDMC)
Concept of a Comprehensive Disaster Management System (CDMS)

The Disaster Management Cycle (and variations)

Source: Disaster Management Guidelines for Municipalities (NDMC)
Concept of a Comprehensive Disaster Management System (CDMS)

Pre-Disaster
- Early Warning
- Alert and Notification
- Prepare
- Monitor
- Evacuate

Disaster
- Response Phase
- Emergency
- Relief
- Assessment

Post-Disaster
- Recovery Phase
- Continuity
- Rehabilitation
- Reconstruction

Non-Disaster
- Mitigation & Prevention
- Risk Assessment
- Risk Avoidance
- Risk Reduction
- Risk Management

Preparedness
- Planning
- Exercise
- Education

The Disaster Management Cycle
Results and Discussion
(Comprehensive Disaster Management System)
Comprehensive Disaster Management System (CDMS)

- Emergency Operations Plan (EOP)
- Emergency Operations Centre (EOC)
- Incident Management Team (IMT)
- Business Continuity Plan (BCP)
- Risk Management System (RMS)
- Emergency Preparedness Plan (EPP)
Comprehensive Disaster Management System

1. Emergency Operations Plan (EOP)

- Basic Plan:
  * Introduction
  * Statement of Purpose
  * Situation & Assumptions
  * Organization & Responsibilities
  * Concept of Operations
  * Administration & Logistics
  * Plan Development & Maintenance
  * Authorities & References
  * Definition of Terms

- Functional Annexes:
  * Animal Care
  * Aviation Operations
  * Communications
  * Damage Assessment & Recovery
  * Direction & Control
  * Emergency Support Services
  * Engineering Services
  * Evacuation
  * Food
  * Finance & Resource Management
  * Hazardous Material
  * Health, Mental Health & Medical Services
  * Information & Planning Management
  * Law Enforcement
  * Mass Care & Sheltering
  * Media Relations & Community Outreach
  * Public Works & Utilities
  * Radiological Protection
  * Search & Rescue
  * Technology Systems
  * Transportation & Roadways

- Hazard-Specific Appendices:
  * Civil Disturbances/Demonstrations
  * Criminal or Violent Behaviour
  * Explosions or Bomb Threats
  * Fire Procedures
  * Hazardous Material Incidents
  * Utility Failures
  * Natural Disasters
  * Earthquakes
  * Hurricanes
  * Radioactivity Release
  * Release of Gas or Vapor
  * Escaped Animals
  * Pathogenic Microorganisms
  * Terrorism Incidents
  * Hazardous Weather Emergencies
  * Pandemic Incidents
  * Other Incidents
Comprehensive Disaster Management System

2. Emergency Operations Centre (EOC)
3. Incident Management Team (IMT)
Comprehensive Disaster Management System

4. Business Continuity Plan (BCP)

- Phase 1: Understand the Business
  - What does the institution do?
    - Analyze institution as a system of:
      - Inputs (People, Material, Time, Finances)
      - Processes (Mechanical, Human, Ergonomics)
      - Outputs (Product and/or Services)
      - Feedback (Stakeholders)
  - When will institution achieve its goals?
    - Determine functions on short, medium and long term time frame.
  - Identify essential resources
    - Identify internal and external role-players who make product or service possible
      - Employees
      - Contractors
      - Investors
      - Bank
      - Customers
      - Suppliers
    - Identify Methods and Techniques needed to achieve goals:
      - People
      - Resources
      - Technology

- Phase 2: Risk Assessment
  - Plan Activation
    - Declaration of Disaster
    - Damage Assessment
    - Continuity Procedures
    - Team Organization
    - Linkages with components of CDMS
      - IMT, EOC, EOP, etc

- Phase 3: Identify Impacts
  - Plan Introduction and Overview
    - Objectives
    - Responsibilities: Implementation, Maintenance, Training, Exercise, etc.

- Phase 4: Develop Business Continuity Plan
  - Plan Activation
  - Continuity Procedures
  - Team Organization
  - Linkages with components of CDMS
    - IMT, EOC, EOP, etc

- Phase 5: Establish Continuity Culture
  - Implement plan to Internal & External Stakeholders
  - Response, Education & Awareness training

- Phase 6: Maintain and Audit Plan
  - Disaster
  - Recovery Process
    - Step 1 - Immediate Response
      - Complete within 12 hours after event
      - Address injuries and immediate dangers
      - Establish safe and secure environment
      - Assess initial damage
      - Activate Incident Management Team (IMT)
      - Activate Emergency Operations Center (EOC)
      - Activate alternate sites
    - Step 2 - Initial Recovery
      - Complete within 12 to 48 hours after event
      - Conduct comprehensive damage assessment
      - Restore basic services
      - Contact external resources
      - Relocate or evacuate resident students
    - Step 3 - Campus Recovery
      - To be completed within 3 weeks after event
      - Repair building damage
      - Secure alternate facilities
      - Erect temporary structures
    - Step 4 - Campus Re-opening
      - Students return to campus
      - Classes resume

- Phase 7: Plan Review
  - Review Action Steps & Revise Procedures
Comprehensive Disaster Management System

5. Risk Management System (RMS)
Overview:
Comprehensive Disaster Management System (CDMS)
Results and Discussion
(DM at SAAI)
Disaster Management at South African Academic Institutions

Responding Universities
Disaster Management at South African Academic Institutions

Emergency Preparedness Coordinator & Committee

Emergency Preparedness Coordinator & Committee

No
Yes
Disaster Management at South African Academic Institutions

Risk Assessments completed

Natural Hazards | Man-Made (Accidental) | Man-Made (Deliberate)
--- | --- | ---
No | Yes | No

- Risk Assessments completed
Disaster Management at South African Academic Institutions

Fire Fighting Training and Equipment Maintenance
Disaster Management at South African Academic Institutions

Hazardous Material Management Policy and Handling
Disaster Management at South African Academic Institutions

Personal Protection Equipment
Disaster Management at South African Academic Institutions

Building Evacuation
Disaster Management at South African Academic Institutions

Incident Management

[Bar chart showing the distribution of team, centre, and equipment with categories for 'no' and 'yes']
Disaster Management at South African Academic Institutions

Information Technology Disaster Recovery
Disaster Management at South African Academic Institutions

Post-Disaster Activities and Support
Disaster Management at South African Academic Institutions

Business Continuity Plans
Disaster Management at South African Academic Institutions

Disaster Recovery Considerations and Agreements

---

Financial Planning  Contractors

- Not Stated
- No
- Yes

---

Disaster Recovery Considerations and Agreements
Disaster Management at South African Academic Institutions

Disaster Management Rating

<table>
<thead>
<tr>
<th>Univ 1</th>
<th>Univ 2</th>
<th>Univ 3</th>
<th>Univ 4</th>
<th>Univ 5</th>
<th>Univ 6</th>
<th>Univ 7</th>
<th>Univ 8</th>
<th>Univ 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>37</td>
<td>12</td>
<td>19</td>
<td>14</td>
<td>23</td>
<td>53</td>
<td>85</td>
<td>58</td>
</tr>
</tbody>
</table>
Disaster Management at South African Academic Institutions

The Average score achieved by the 9 universities were 12.6 marks (20%)
Conclusion

- The low average score achieved indicates a relative low level of implementation of various disaster management activities and systems.
- It can therefore be concluded that Academic Institutions generally does not implement Comprehensive Disaster Management Systems.
- There are however two universities that achieved relatively high scores, demonstrating the implementation of a more comprehensive disaster management system.
- A trend emerged showing that universities with between 10 000 – 20 000 full-time students scored much higher that universities with less than 10 000 and more than 20 000 full-time students.
- One explanation for this trend might be found in the manageability of the institution as well as the availability of resources.
- One can argue that a university with less than 10 000 students might not have adequate resources to implement effective disaster management systems, with universities with more than 20 000 students experiencing difficulty in managing the large amount of people.
- These explanations are, however, only speculation and deserve further investigation.
Limitations & Recommendations

Limitations:
• Some Universities were not willing to take part
• Access to Information was also limited
• Study only focused on ‘Desktop/Administrative’ systems – not on-site evaluation.

Recommendations:
• It is recommended that Academic Institutions should evaluate their own DMS
• If deemed necessary, the South African Government, through a relevant department should establish guidelines aimed at creating disaster resistant academic institutions.
• Currently, and in the absence of such an official policy, it is up to the management of academic institutions to follow a holistic and participatory approach in implementing comprehensive disaster management systems throughout all aspects of their institutions.
• This is however, not always done.
Remarks, Questions and Comments

Theuns van der Linde
SRK Consulting Engineers and Scientists
tvanderlinde@srk.co.za

Andries Jordaan
University of the Free State (DiMTEC)
jordaanA.sci@ufs.ac.za