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

Incidents at Academic Institutions

- **Virginia Tech, Virginia, USA**
  - 16 April 2007
  - Shooting on Campus
  - 32 killed
  - Shooter committed suicide

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)
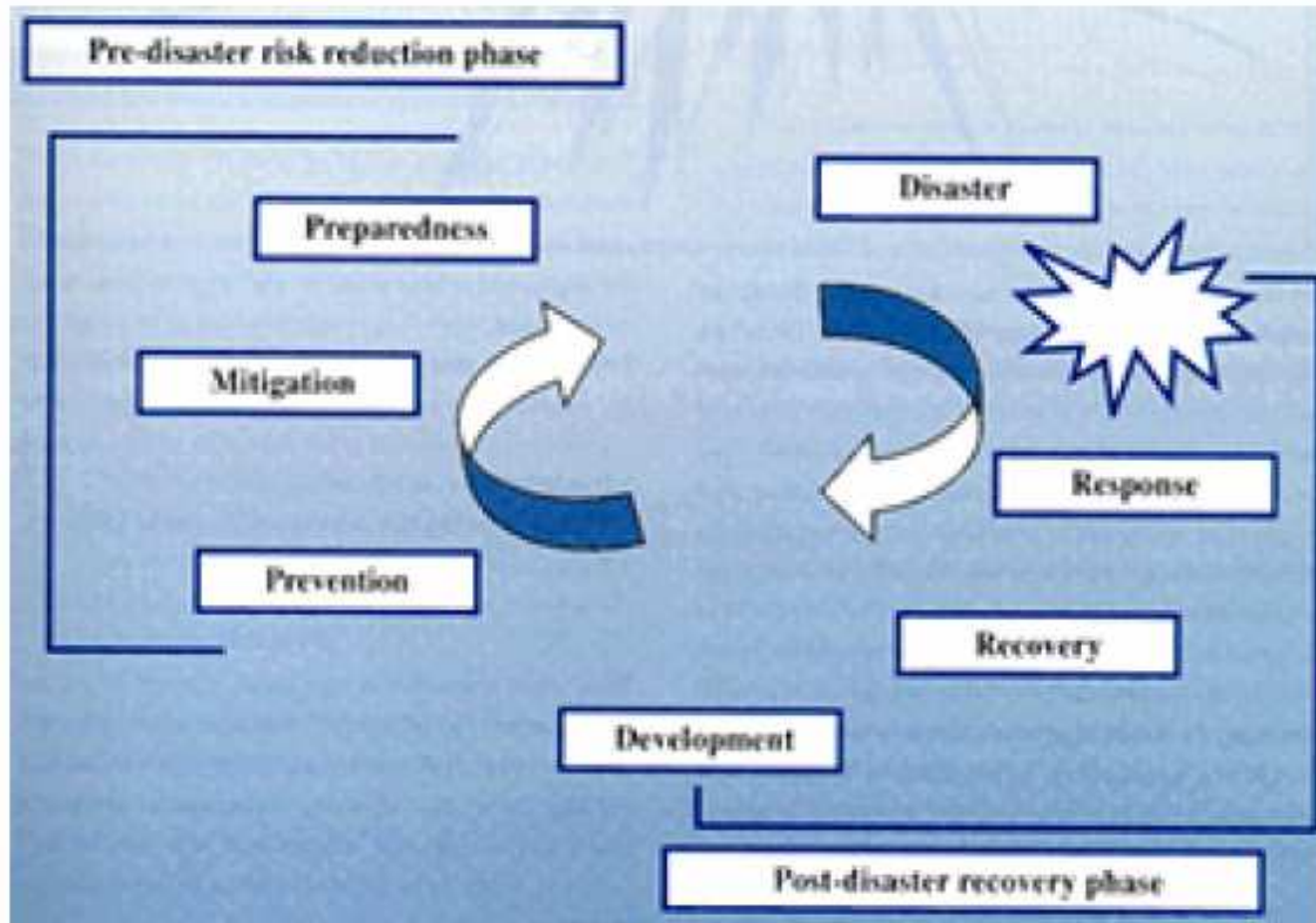
Source: Disaster Management Guidelines for Municipalities (NDMC)

Concept of a Comprehensive Disaster Management System (CDMS)
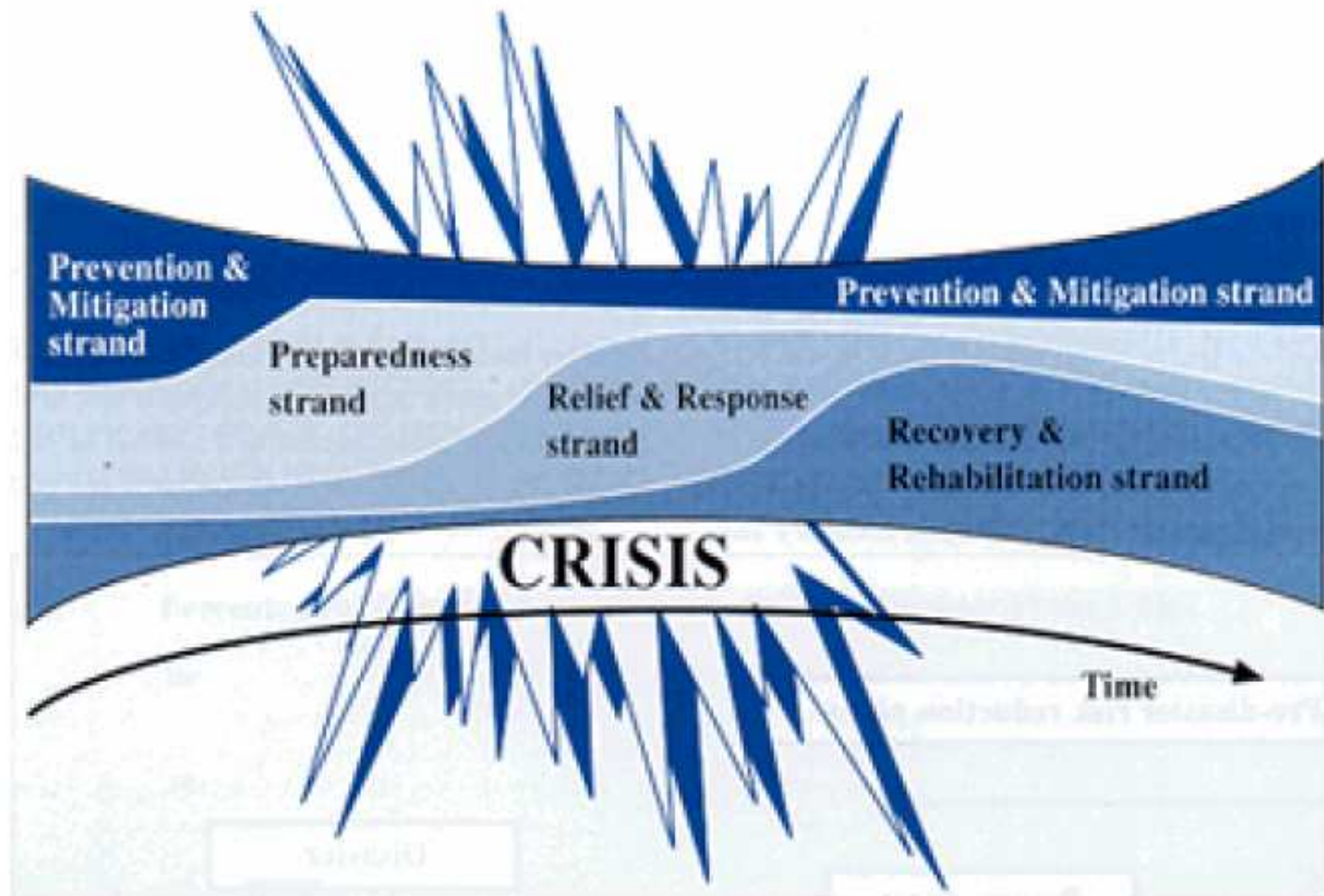
The Disaster Management Cycle (and variations)

Source: Disaster Management Guidelines for Municipalities (NDMC)

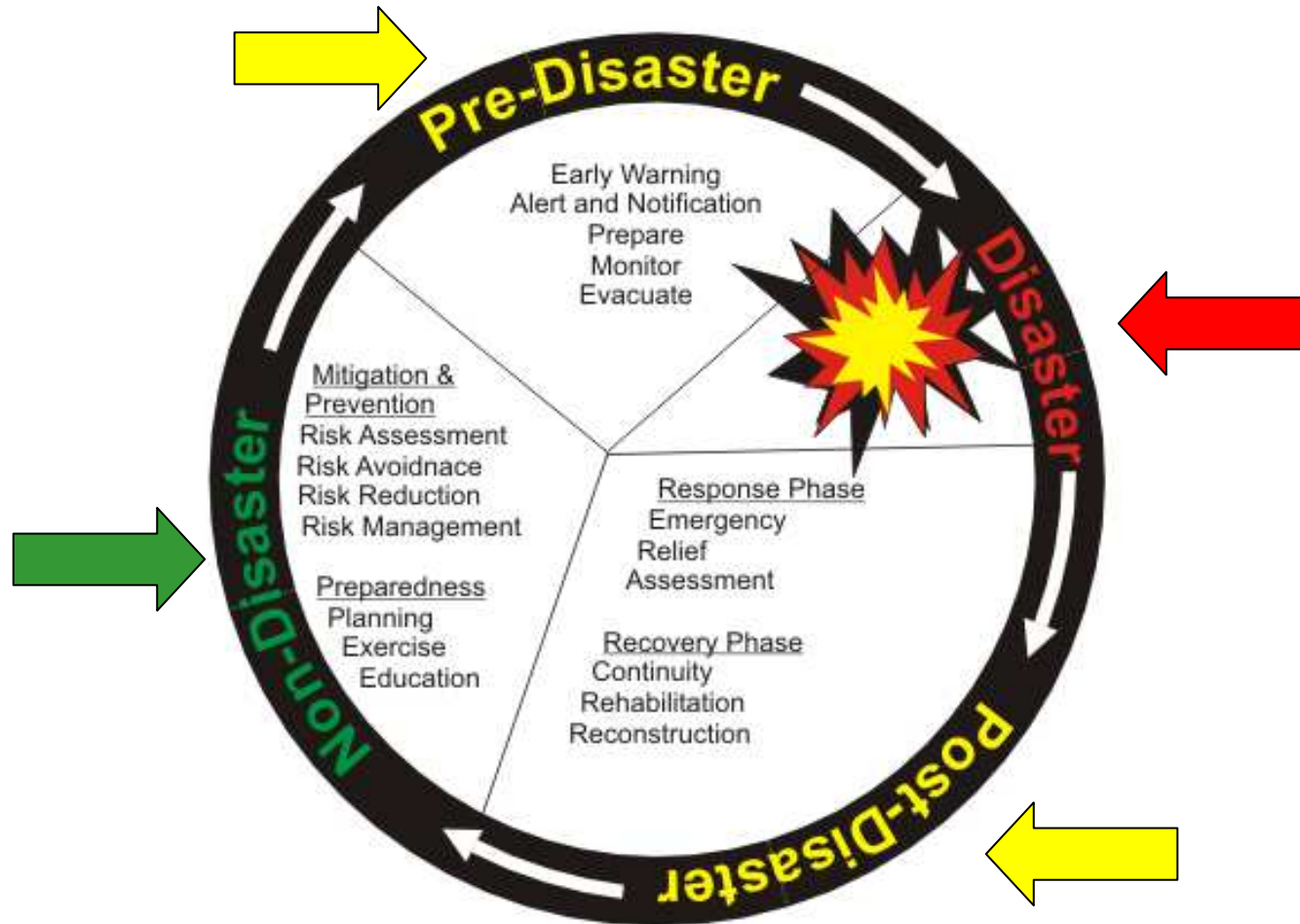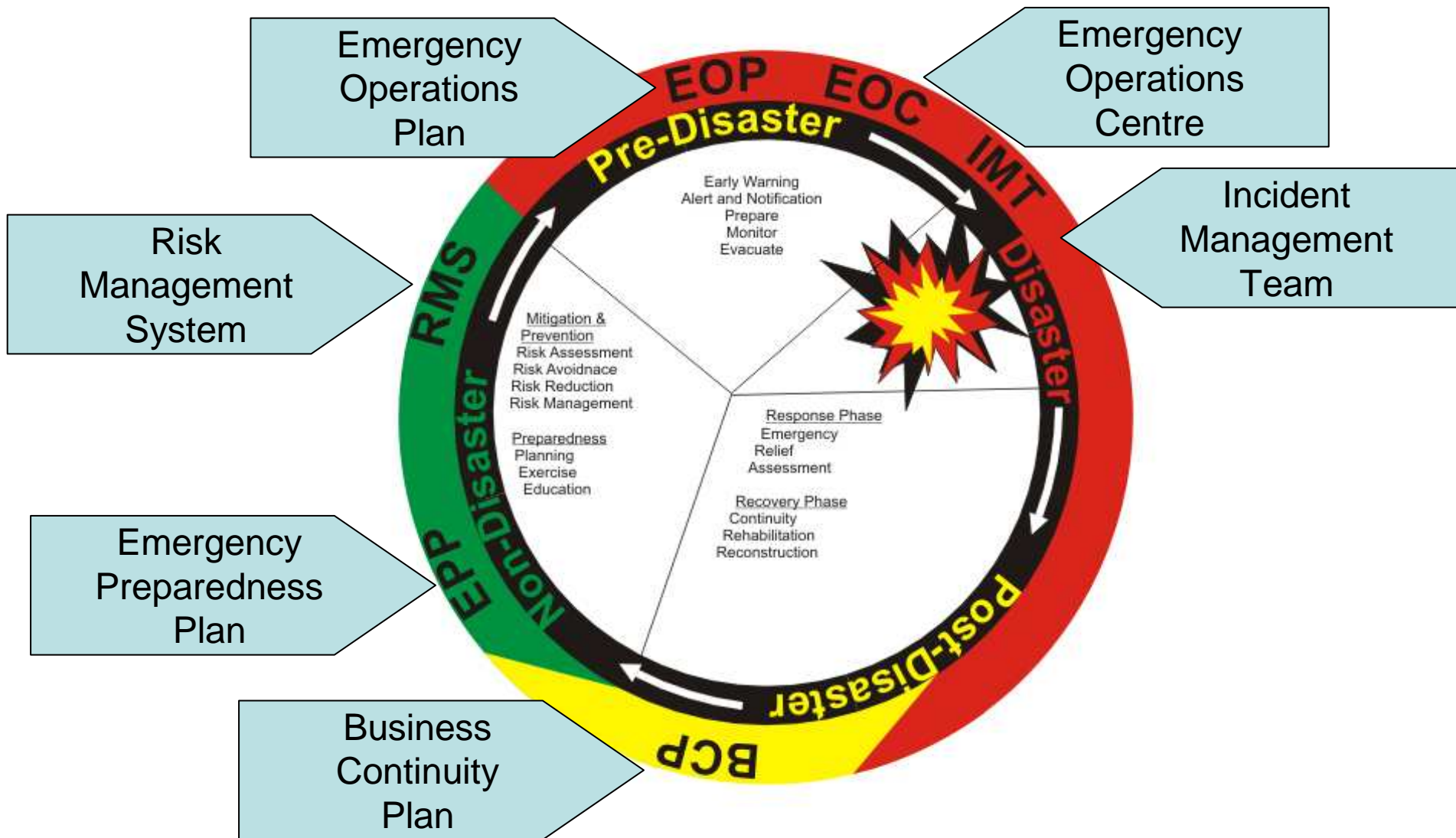# Concept of a Comprehensive Disaster Management System (CDMS)

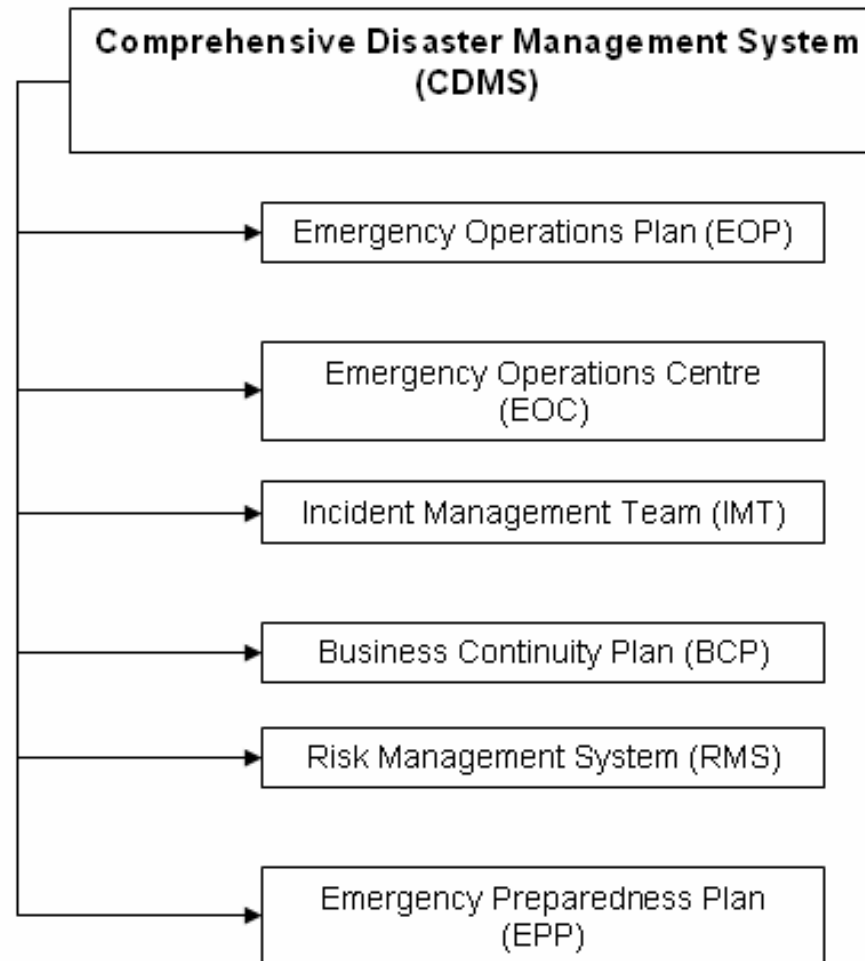*The Disaster Management Cycle*

Results and Discussion
(Comprehensive Disaster Management System)

Comprehensive Disaster Management System (CDMS)

Comprehensive Disaster Management System

Comprehensive Disaster Management System

1. Emergency Operations Plan (EOP)

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

2. Emergency Operations Centre (EOC)

Comprehensive Disaster Management System

3. Incident Management Team (IMT)

4. Business Continuity Plan (BCP)

Phase 1 - Understand the Business

What does the Institution do?
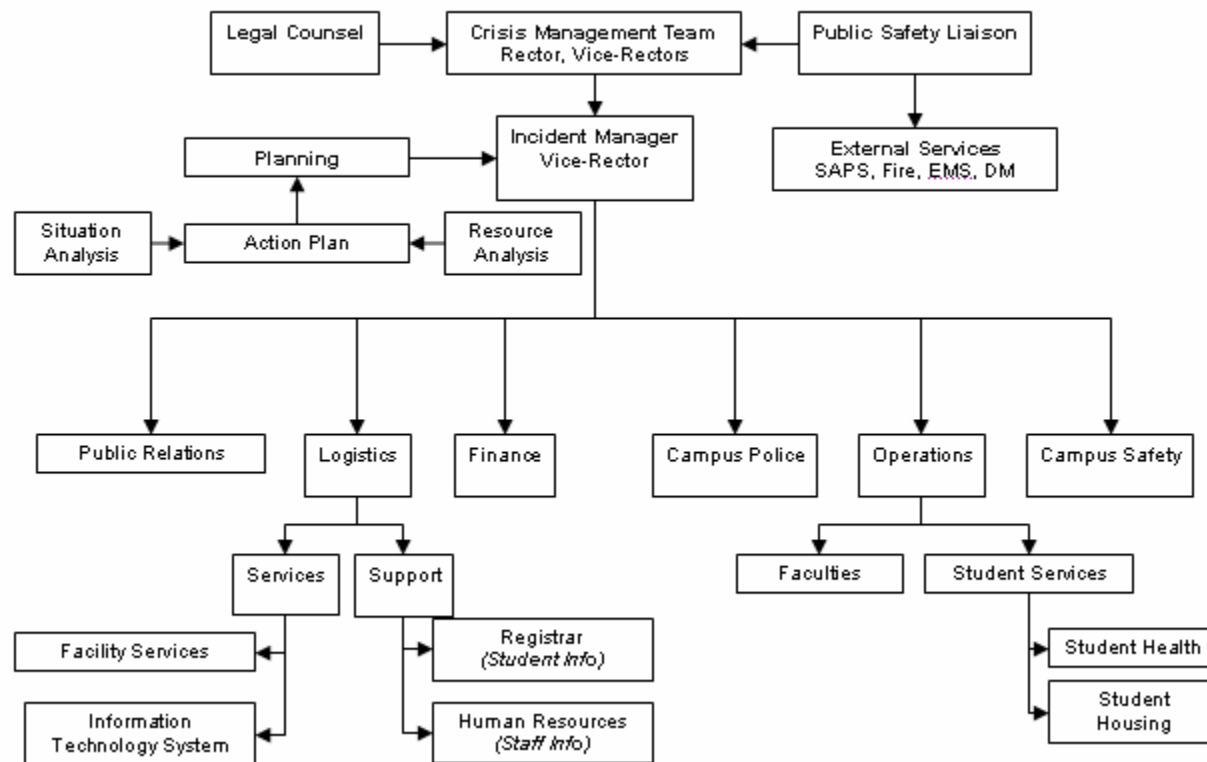Analyze institution as a system of:
- Inputs (People, Material, Time, Finances)
- Processes (Mechanical, Human, Ergonomics)
- Outputs (Product and/or Services)
- Feedback (Stakeholders)

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 3 - Identify Impacts

Phase 2 - Risk Assessment

Phase 4 - Develop Business ContinuityPlan

Plan Introduction and Overview
- Objectives
- Responsibilities: Implementation, Maintenance, Training, Exercise, etc.

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

Phase 6 - Maintain and Audit Plan

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

DISASTER

Phase 7 - 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 8 - Plan Review

Review Action Steps & Revise Procedures

Comprehensive Disaster Management System

5. Risk Management System (RMS)

Phase 1 - Organize Resources

Create Planning Committee - Identify key role-players
Obtain Official Recognition - University Management
Obtain Support - Faculty Heads, Personnel, Staff, Students
Obtain Resources - Technical, Financial, Human
Determine Planning Area - Formally demarcate and document planning area
Create Base Map - Buildings, Land-use, Critical Service, Hazardous Areas, Vulnerly Areas
Public Participation - Hold regular public information and participation meetings

Phase 2 - Risk Assessment

Risk Assessment	Capacity Assessment	Vulnerability Assessment	Hazard Assessment
• Complete Risk Assessment • Prioritize risks.	Determine current community capacity to: • Mitigate hazard characteristics • Reduce vulnerability	• Characteristics of hazard prone area • Elements at Risk • People at Risk • Losses	• Hazard Type • Warning Signs • Speed of Onset • Frequency • Magnitude • Probability • Geographic Extent • Duration

Phase 3 - Prevention and Mitigation Activities

Develop Goals and Objectives	Identify Measures	Evaluate Measures (STAPLEE)
• Mitigation Goals and Objectives, • Acceptable levels of Risk	• Prevention • Property Protection • Natural Resource Protection • Emergency Services • Structural Projects • Public Information	• Social • Technical • Administrative • Political • Legal • Economic • Environmental

Phase 4 - 6: Create, Evaluate and Implement Plan

Phase 7 & 8 - Evaluate Measures and Update Plan

6. Emergency Preparedness Plan (EPP)

Overview:
Comprehensive Disaster Management System (CDMS)

Emergency Operations Plan

Emergency Operations Centre

Risk Management System

Incident Management Team

Emergency Preparedness Plan

Business Continuity Plan

EOP   EOC
Pre-Disaster
IMT
Disaster
RMS
Non-Disaster
EPP
BCP
Post-Disaster

Early Warning
Alert and Notification
Prepare
Monitor
Evacuate

Mitigation &
Prevention
Risk Assessment
Risk Avoidnace
Risk Reduction
Risk Management

Preparedness
Planning
Exercise
Education

Response Phase
Emergency
Relief
Assessment

Recovery Phase
Continuity
Rehabilitation
Reconstruction

Disaster Management at South African Academic Institutions

1

2

6

5-10

10-20

20+

Responding Universities

Disaster Management at South African Academic Institutions

Emergency Preparedness Coordinator & Committee

Disaster Management at South African Academic Institutions
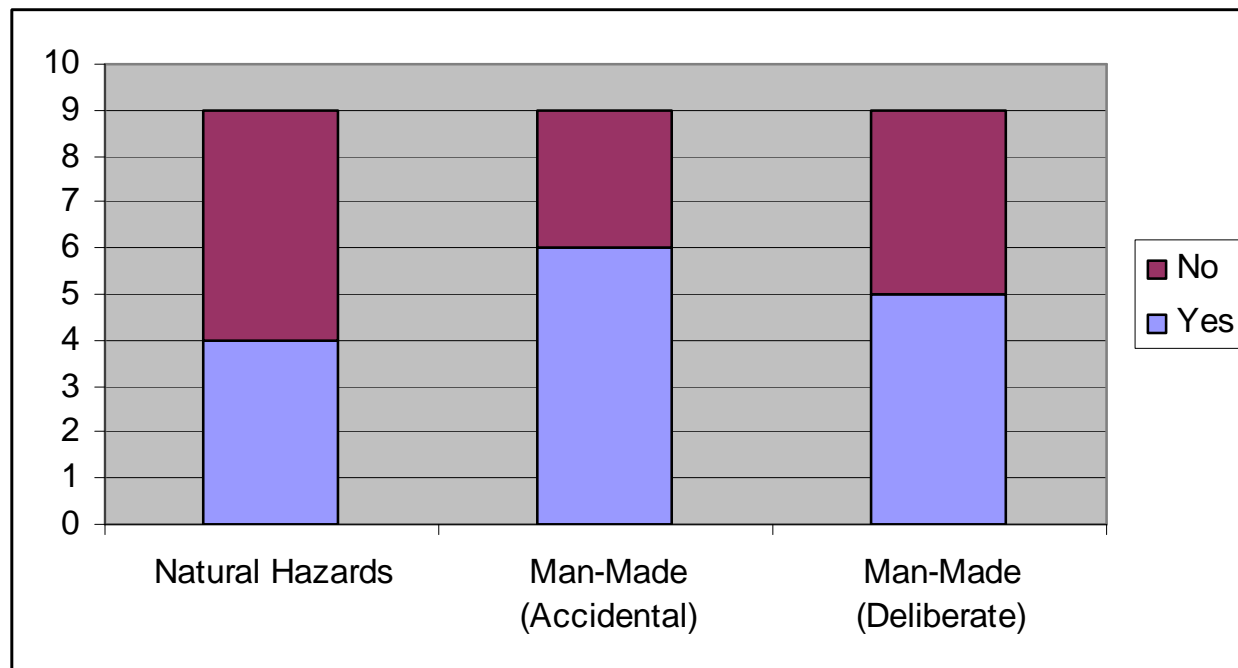
Risk Assessments completed

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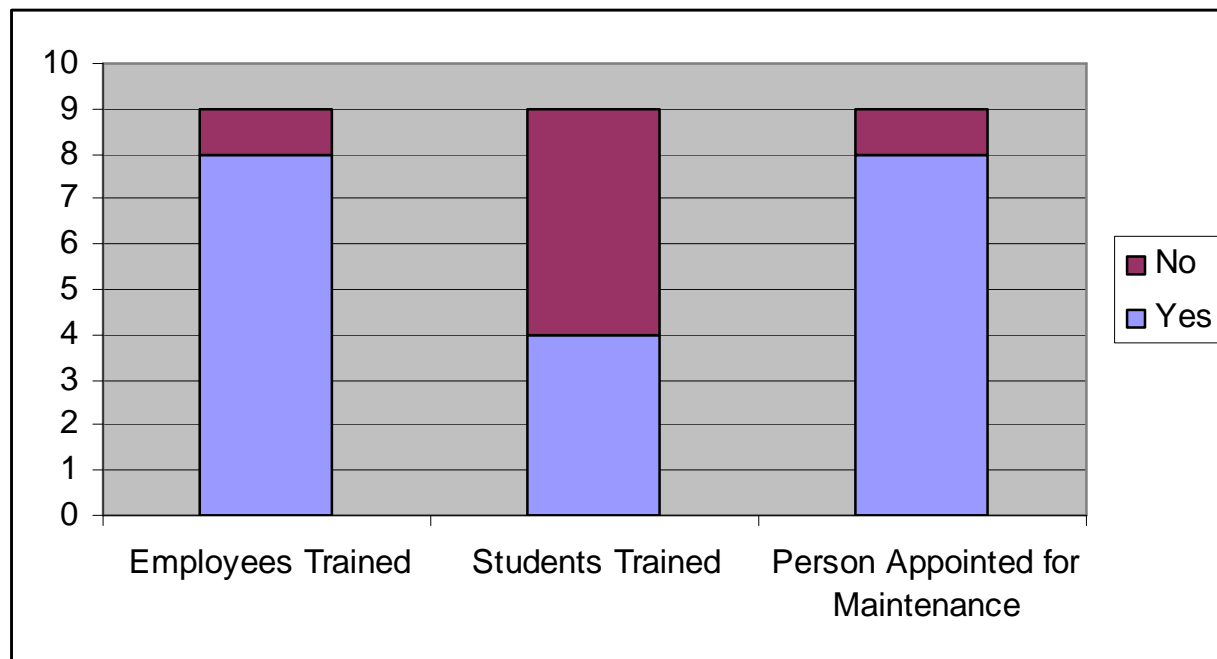
Fire Fighting Training and Equipment Maintenance

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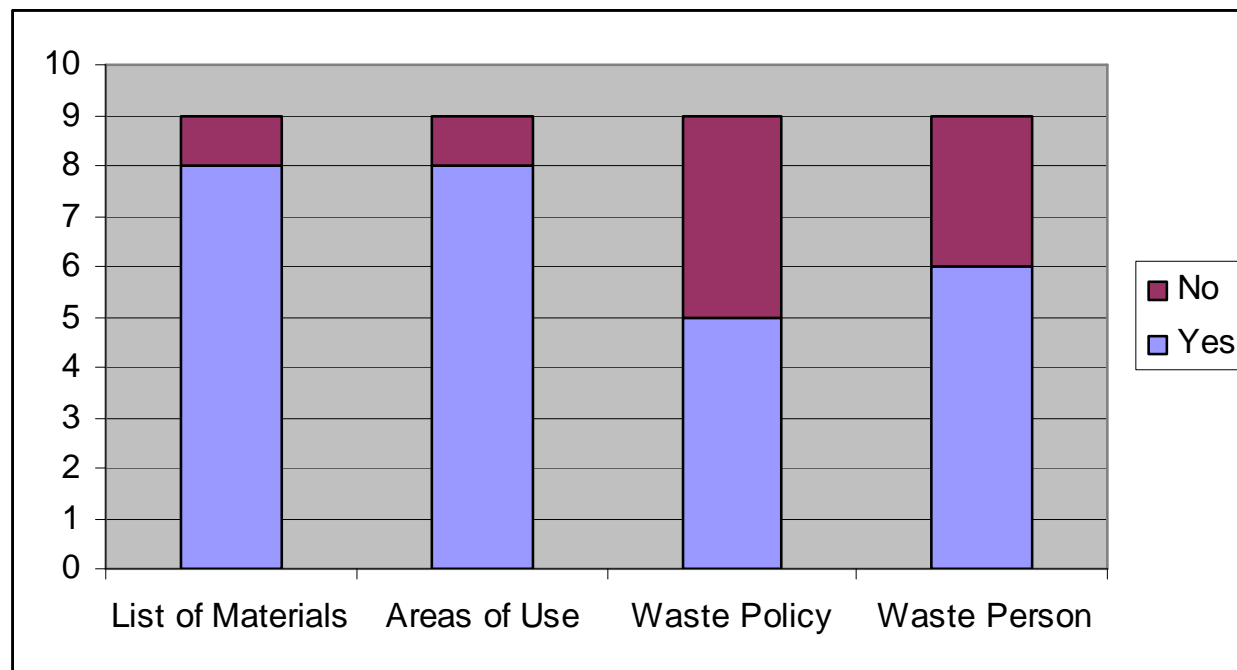
Hazardous Material Management Policy and Handling

Disaster Management at South African Academic Institutions
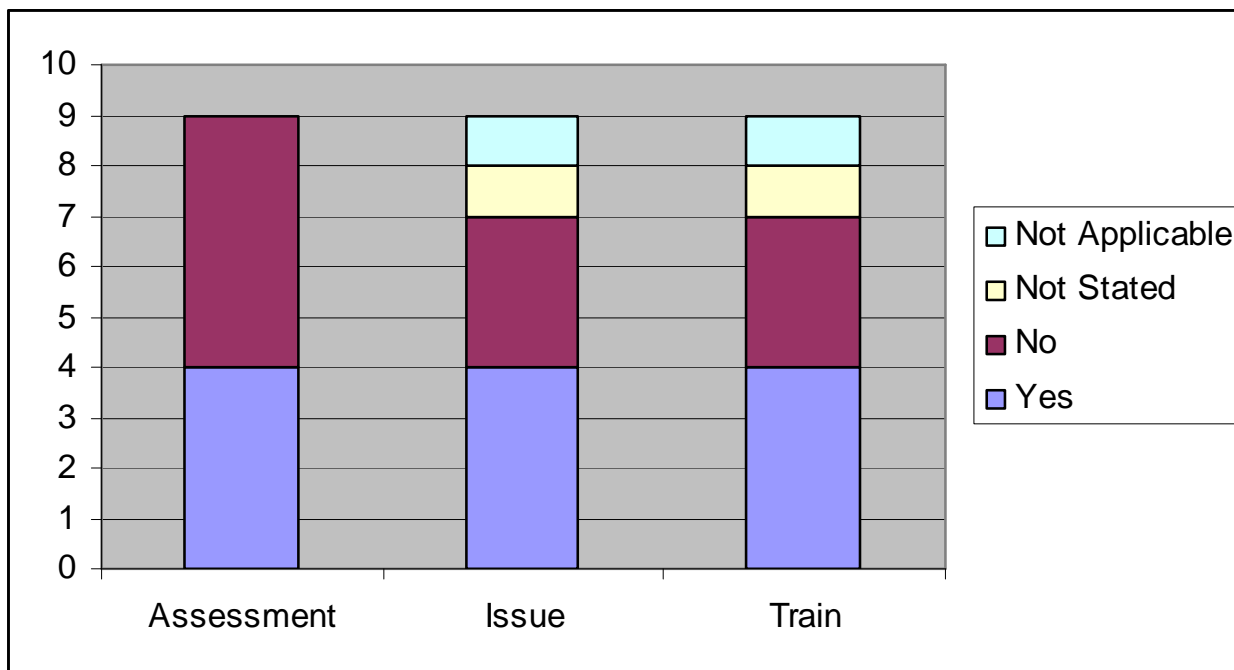
Personal Protection Equipment

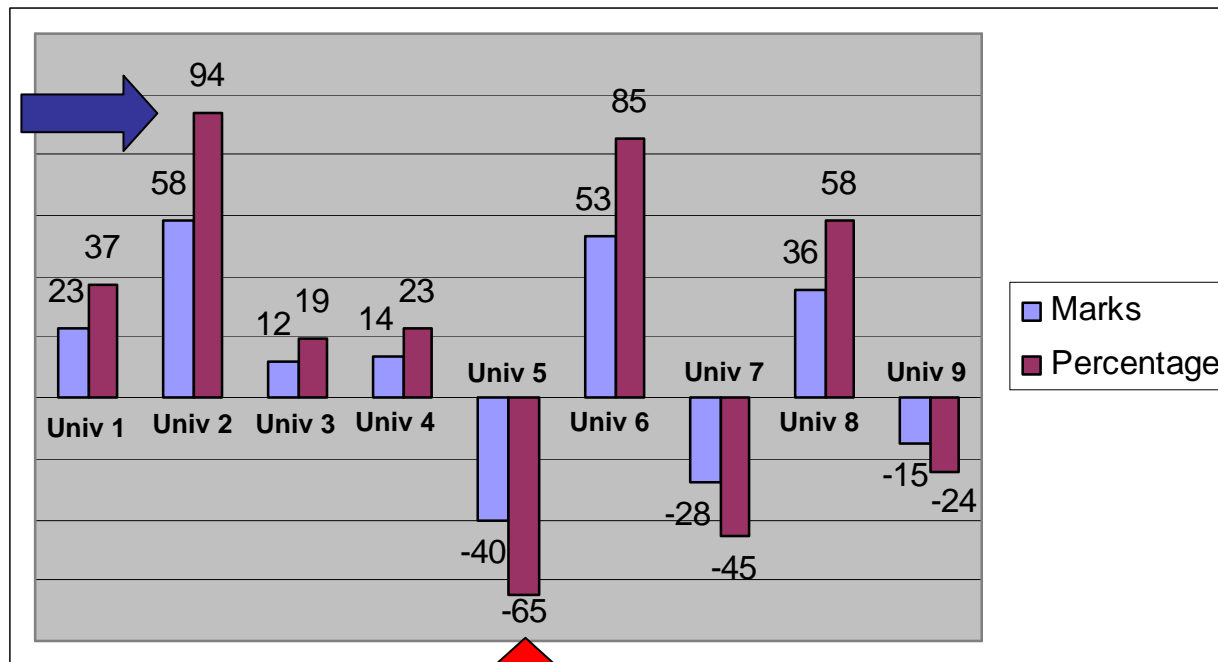# Disaster Management at South African Academic Institutions
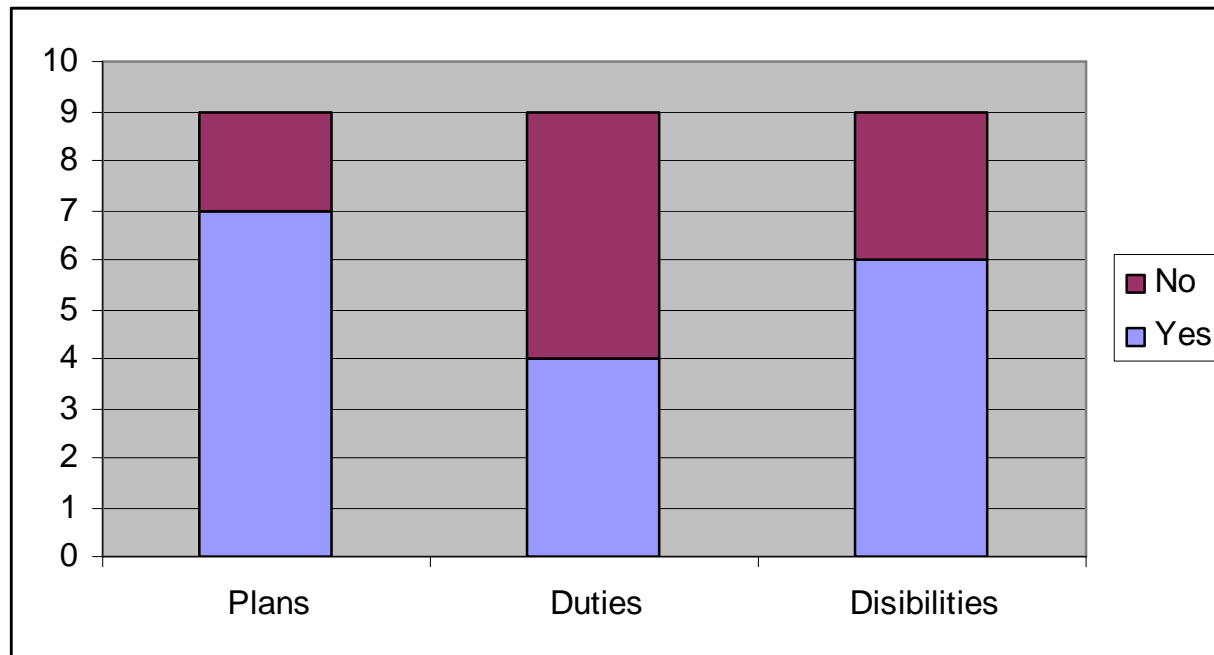
Building Evacuation

Disaster Management at South African Academic Institutions
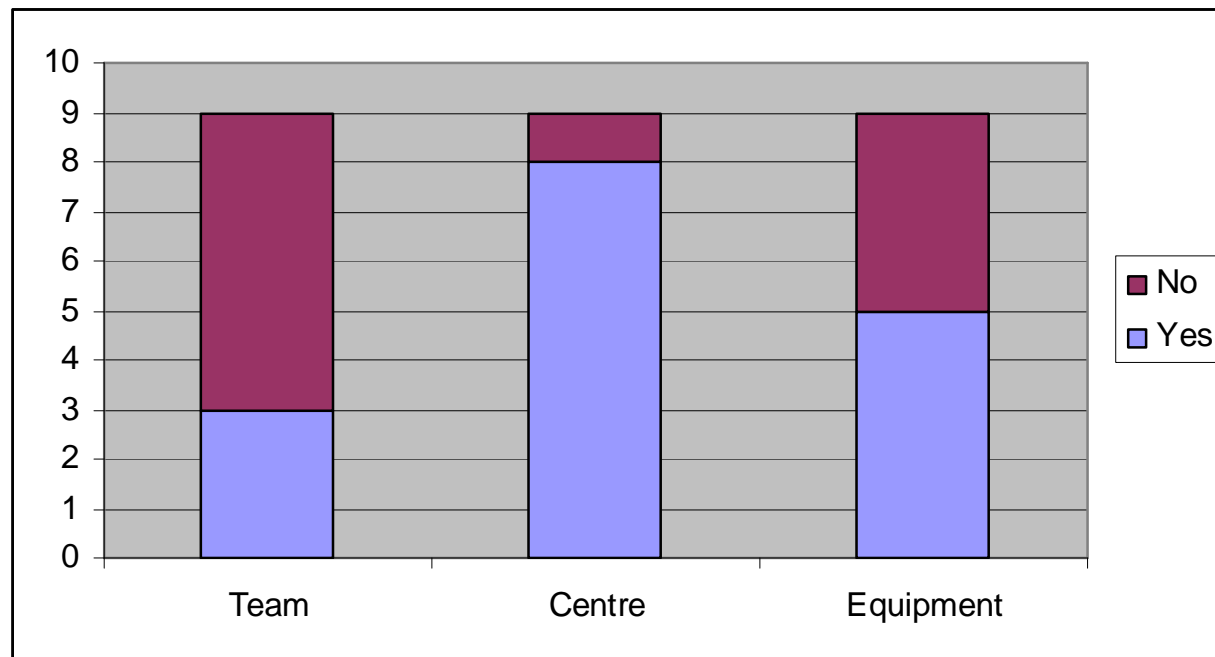
Incident Management

Disaster Management at South African Academic Institutions
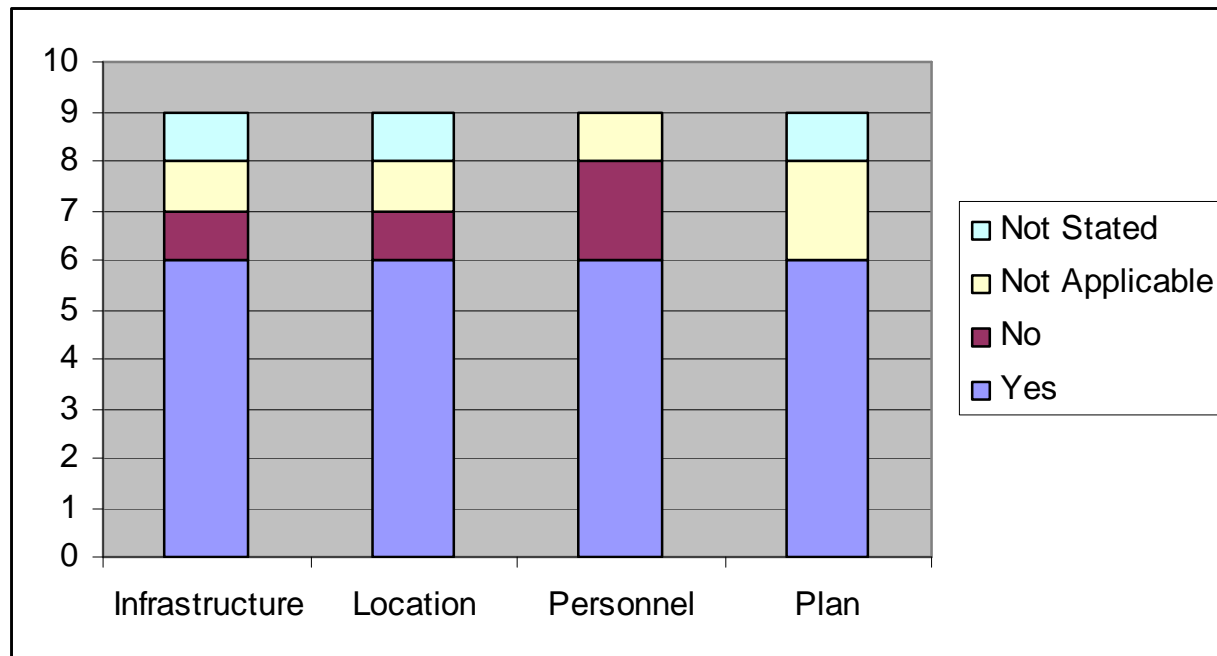
Information Technology Disaster Recovery

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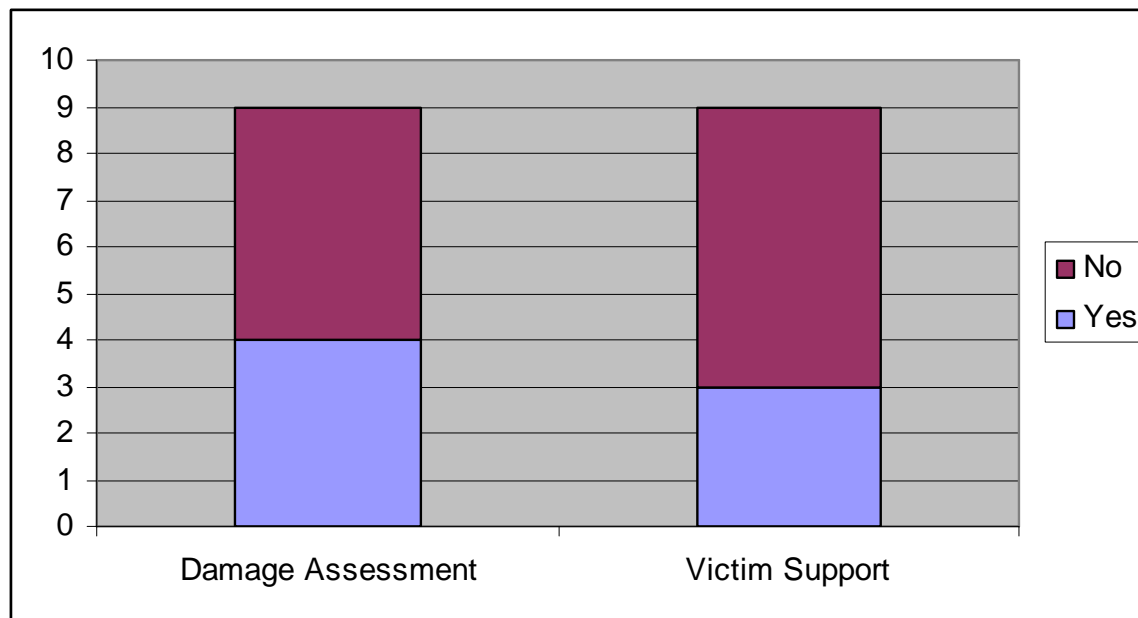
Post-Disaster Activities and Support

Disaster Management at South African Academic Institutions
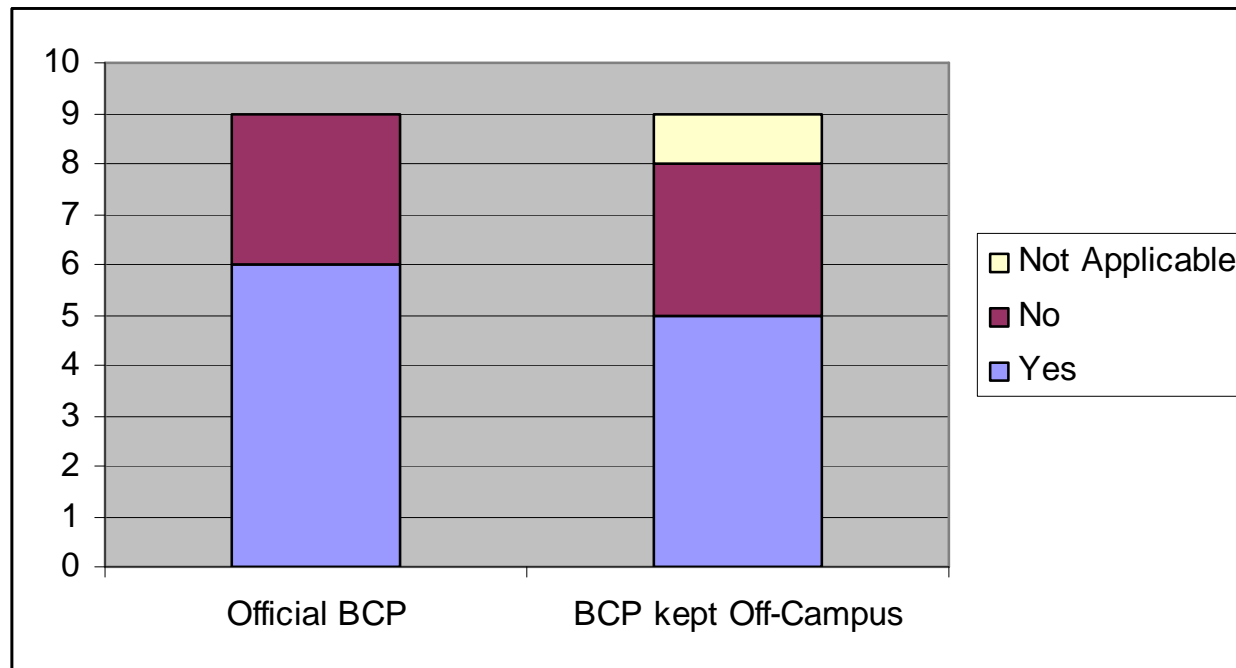
Business Continuity Plans

Disaster Management at South African Academic Institutions
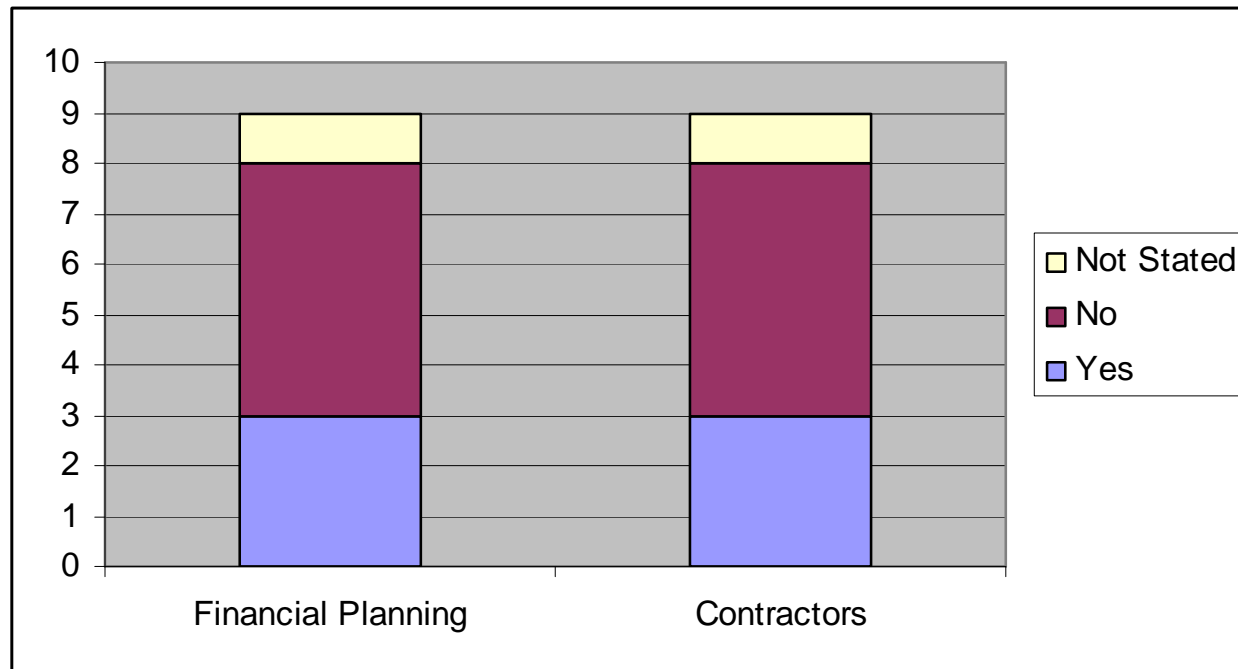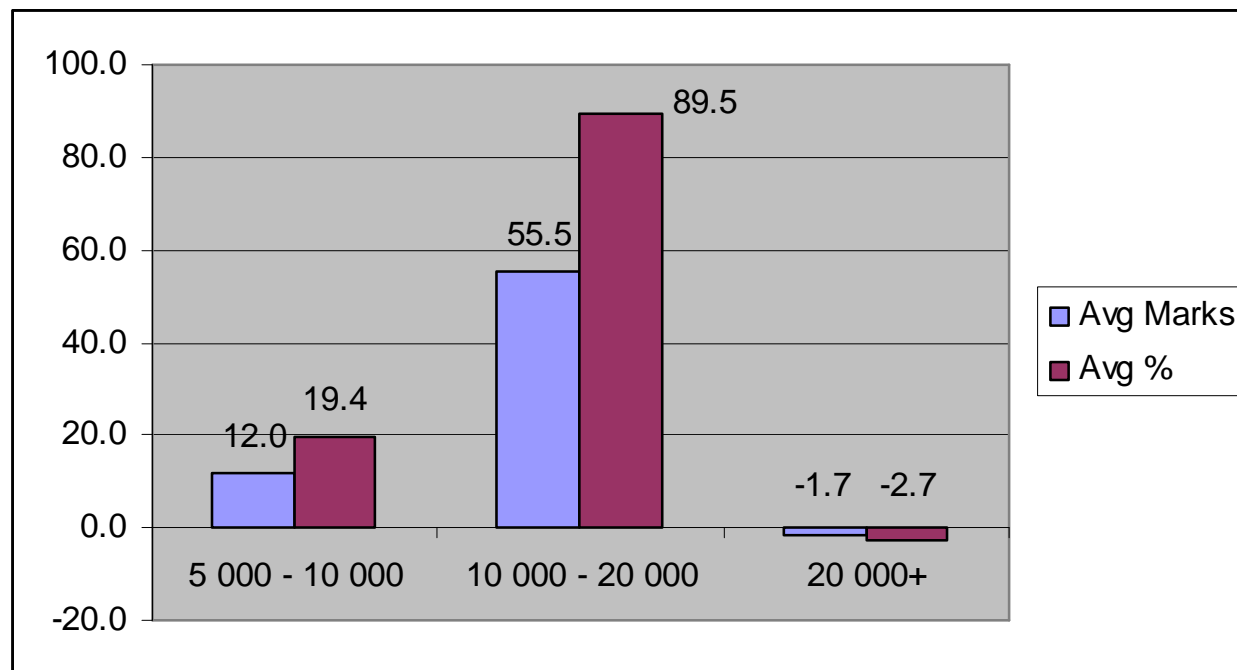

Disaster Recovery Considerations and Agreements

Disaster Management at South African Academic Institutions

Disaster Management Rating

Disaster Management at South African Academic Institutions

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

Disaster Management Rating

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
Univeristy of the Free State (DiMTEC)
jordaanA.sci@ufs.ac.za