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Symposium & Workshop
Preservation Management of Special
Collections
Theme: Care, Handling & Storage of
Collections

**Promoting Preventive Conservation Practice
&
Integrated Pest Management**

Building Management:

Internal Environment

**Integrated Management –
by Design**

About the Speaker

Kevin Govender:

Position:

Managing Director of Alpha Technology Systems (Pty) Ltd
Chief Visionary Officer, and Technical Officer at ABDCE (Pty) Ltd

Built Environment experience:

Began working in the Built Environment since 1995.

Work Experience:

Fire Detection, Access Control, Building Management Systems and Video Surveillance specialist
supplier, installer and integrator.

Key Activities:

System architecture, configuration, commissioning, project management, maintenance and repairs

Consultant, Coach, Mentor, Speaker and Trainer, specializing in business, personal and professional development.

Continuing Professional Development (**CPD**) **Trainer** and content creator, specializing in:

fire and life safety systems,

including certain National Building Regulations (NBR's) and South African National Standards, and related technologies,

as well building and energy management systems.



An Overview of this Presentation

Context:

Promoting Preventive Conservation Practice &
Integrated Pest Management

WRT Building Management – The Internal Environment (SA)

Aim - Create and awareness of the:

- **Risks** and **challenges** faced in our **buildings**
- **Technologies** available in creating appropriate **solutions**
- **Compliance requirements** with the relevant **legislation**
- **Funding** – **opportunities...**

An Overview of this Presentation

Key Concept:

- **Understand** the **interrelatedness** of **system components**
- **Individual components (stand alone systems)** *do not* necessarily equate to a **solution**
- **Integrated solutions preferred**
- **Manage** by **design...**

Systems Thinking

Cats of Borneo video...

Problem Statement

Risks and **challenges**
faced in our
buildings

Risks and challenges

Risks & Challenges

Fire

Humidity,

Air quality,

Pests,

Fungi/Mould,

Load shedding,

Natural disasters,

Rioting, looting, human
destruction, and

Funding.

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Impact

Risk to life

Risk to property:

Destruction of artefacts, building,
infrastructure.

Incidental damage by heat,
smoke, gasses released during
combustion.

Further damage by inappropriate
fire protection means.

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Impact

Risk to persons

Condensation

Mould

Fungi

Pests

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Impact

Risk to life

Dust

Pollen

Mould

Fungi

Pests

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Impact

Risk to life

Discussed extensively to date
and well understood

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Impact

Disruption to environmental
equipment – HVAC, UVGI, etc.

Consequences as previously
discussed.

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

**Rioting, looting, human
destruction, and**

Funding

Impact

Well understood and self
explanatory

Risks and challenges

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Impact

Inability to procure/ensure
required risk mitigation of
protection measures in place.

Understanding the Relationships

My observation of the discussions to date:

It is evident that the persons in the room are well versed on the:
causal relationships of the **adverse environmental factors**,
consequential impact to the **artefacts**, and
preventative measures, e.g.

%/RH,

Temperature,

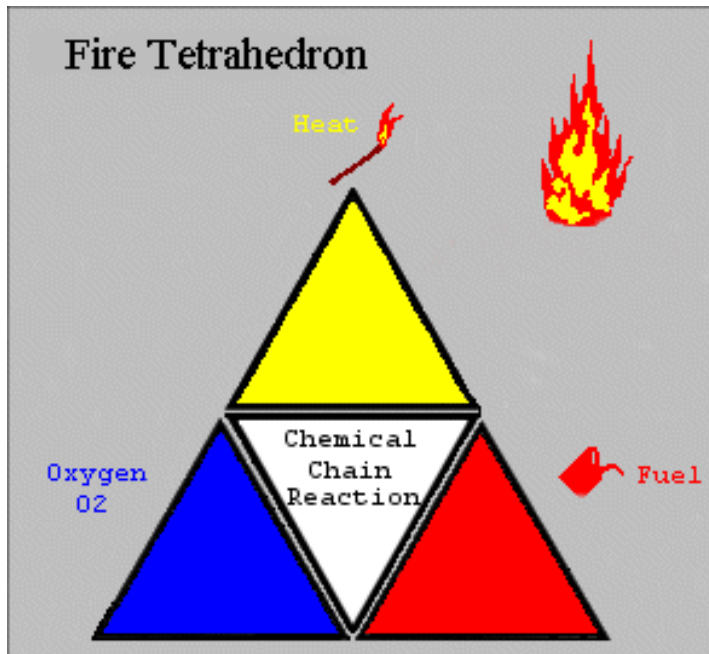
Maintenance, HVAC, Freezing,

So we will spend time on items not yet fully covered or discussed yet...

Understanding the Relationships

Risks & Challenges

Fire



<https://www.firesafe.org.uk/information-about-the-fire-triangletetrahedron-and-combustion/>

Ecosystem

Fire Tetrahedron:

1. Fuel
2. Oxygen
3. Source of Ignition (heat)
4. Chemical reaction (self sustaining)

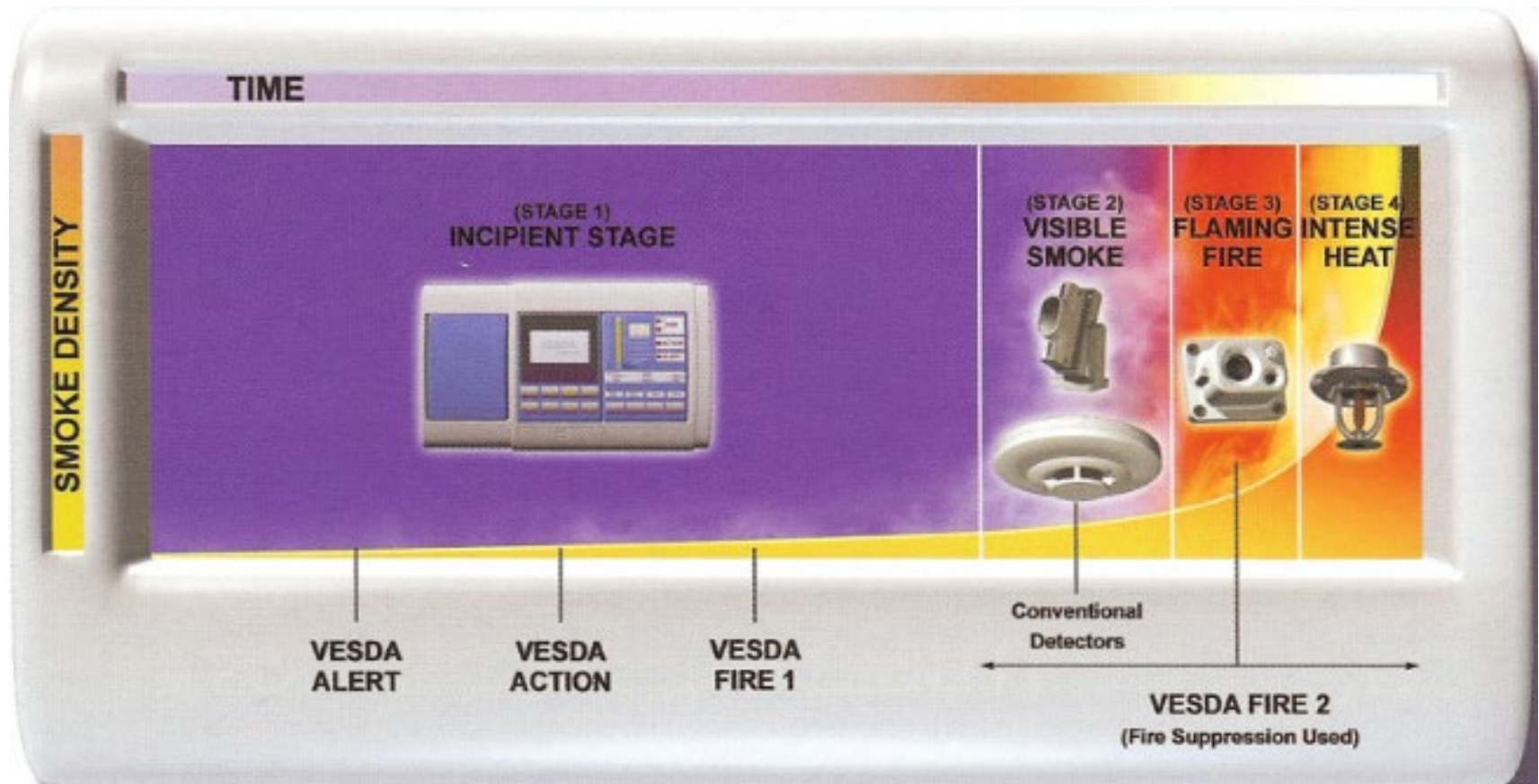
Remove any one component and the Tetrahedron collapses...

Understanding the Relationships

Risks & Challenges

Ecosystem

Fire



Understanding the Relationships

Risks & Challenges

Mould/Fungi



Ecosystem

Conducive Environment:

1. High %RH,
2. Suitable temperatures

Understanding the Relationships

Risks & Challenges

Load shedding



Ecosystem

Environment:

1. No generator backup,
2. No UPS,
3. No inverter backup,
4. No green/passive systems in place.

Understanding the Relationships

Risks & Challenges

Funding



Ecosystem

Environment:

1. Institution dependent

Solution Statement

Integrated solutions
by **design**

Applicable technologies

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Some Technologies/Systems

Very early warning smoke
detection,

Inert gas suppression,

Smoke ventilation,

Compartmentation,

~~Oxygen removal (unmanned
areas),~~

Intumescent paints,

Fire proofing

Applicable technologies

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
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Funding

Some Technologies/Systems

Building management systems:

- User interface,
- Sensors,
- Controllers,

HVAC systems,

Dehumidifiers,

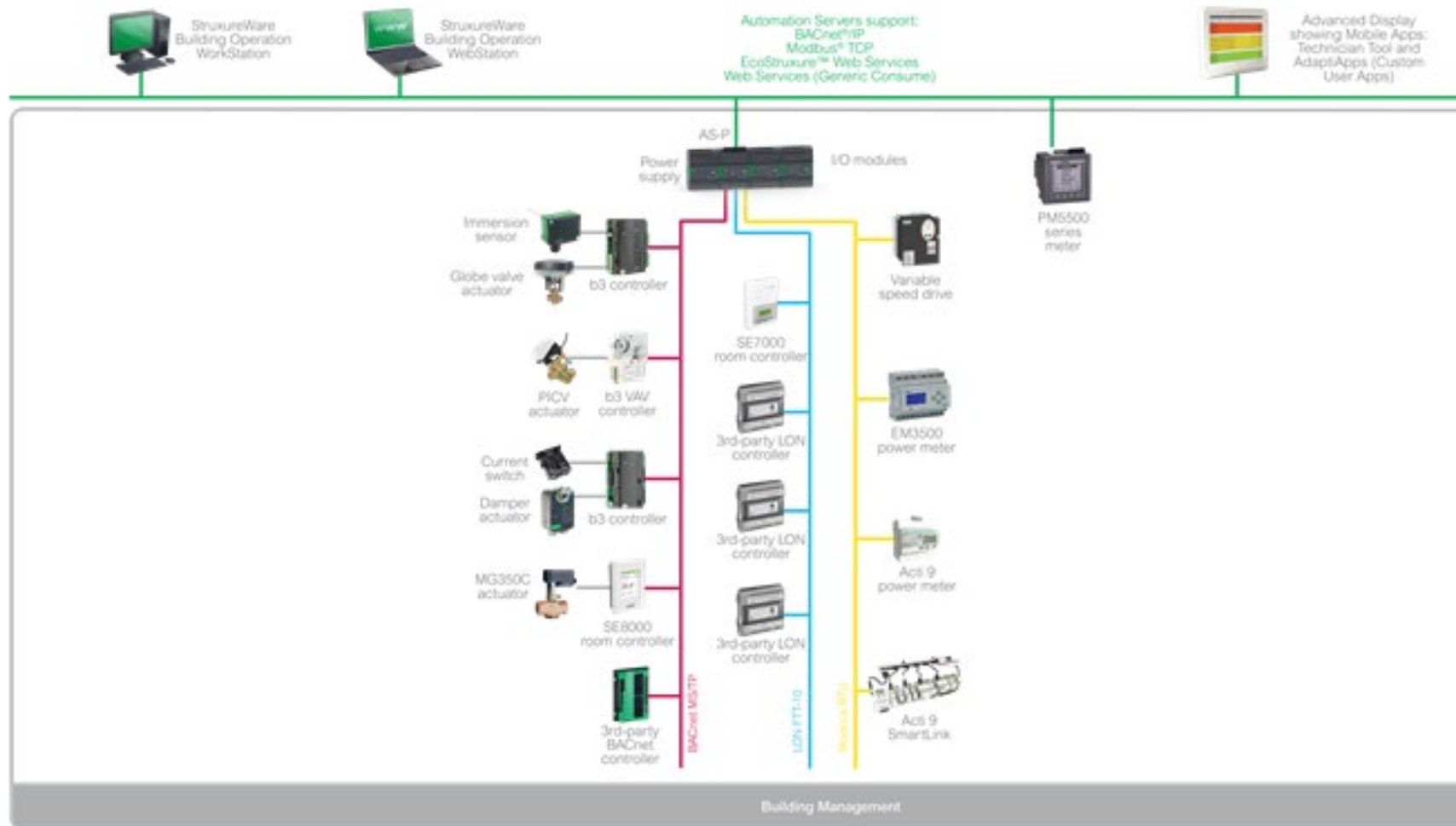
HEPA filters

UVGI

- Above room,
- Surface irradiation

Applicable technologies

SmartStruxure™ solution architecture: single Automation Server (SmartX Controller – AS-P)
Powered by StruxureWare™ Building Operation v1.8.1



Applicable technologies

Risks & Challenges

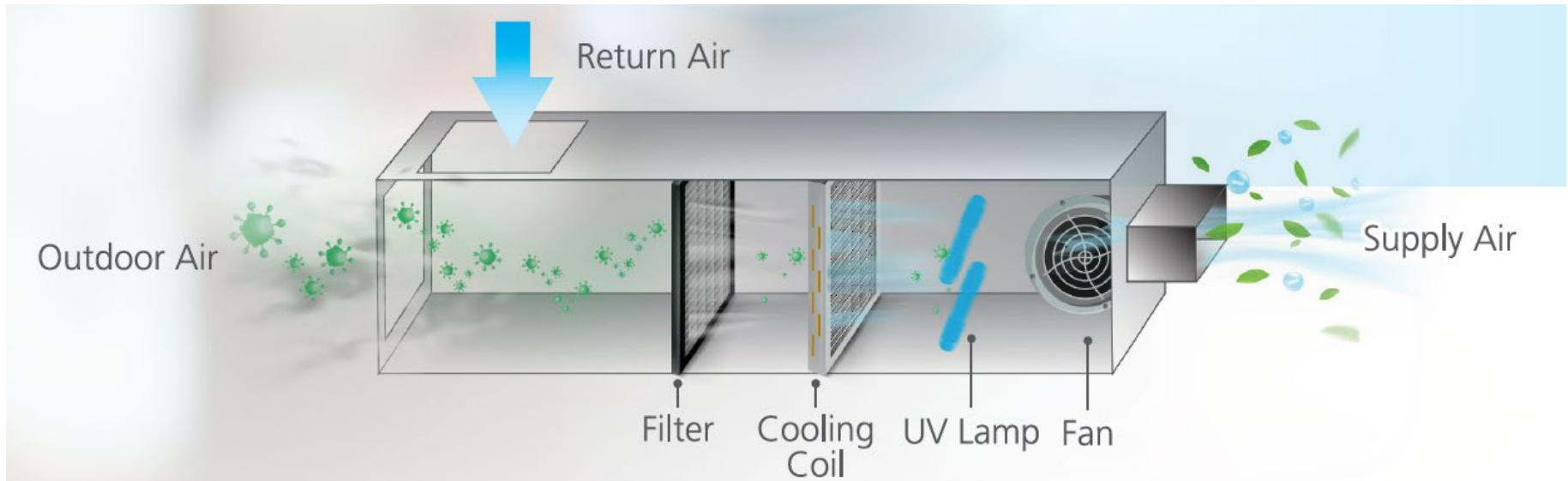
Fire

Humidity

Air quality

Some Technologies/Systems

UVGI



Applicable technologies

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Some Technologies/Systems

Planned preventative
maintenance,

Routine inspections,

Applicable technologies

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Some Technologies/Systems

Generator backup,

UPS installations,

Inverter backup systems,

Green/passive systems:

Solar Photovoltaic supply,

Ice tanks,

Passive ventilation systems

Applicable technologies

Risks & Challenges

Fire

Humidity

Air quality

Pests

Fungi/Mould

Load shedding

Natural disasters

Rioting, looting, human
destruction, and

Funding

Some Technologies/Systems

Section 18A PBO tax exemption,
Public Private Partnerships,
Specific sponsorship
programmes,
Collaborations,
Monetization

Applicable technologies

- (i) Conflict resolution, the promotion of reconciliation, mutual respect and tolerance between the various peoples of South Africa.
- (j) The promotion or advocacy of human rights and democracy.
- (k) The protection of the safety of the general public.
- (l) The promotion or protection of family stability.
- (m) The provision of legal services for poor and needy persons.
- (n) The provision of facilities for the protection and care of children under school-going age of poor and needy parents.
- (o) The promotion or protection of the rights and interests of, and the care of, asylum seekers and refugees.
- (p) Community development for poor and needy persons and anti-poverty initiatives, including —
 - (i) the promotion of community-based projects relating to self-help, empowerment, capacity building, skills development or anti-poverty;
 - (ii) the provision of training, support or assistance to community-based projects contemplated in item (i); or
 - (iii) the provision of training, support or assistance to emerging micro enterprises to improve capacity to start and manage businesses, which may include the granting of loans on such conditions as may be prescribed by the Minister by way of regulation.
- (q) The promotion of access to media and a free press.



Applicable technologies

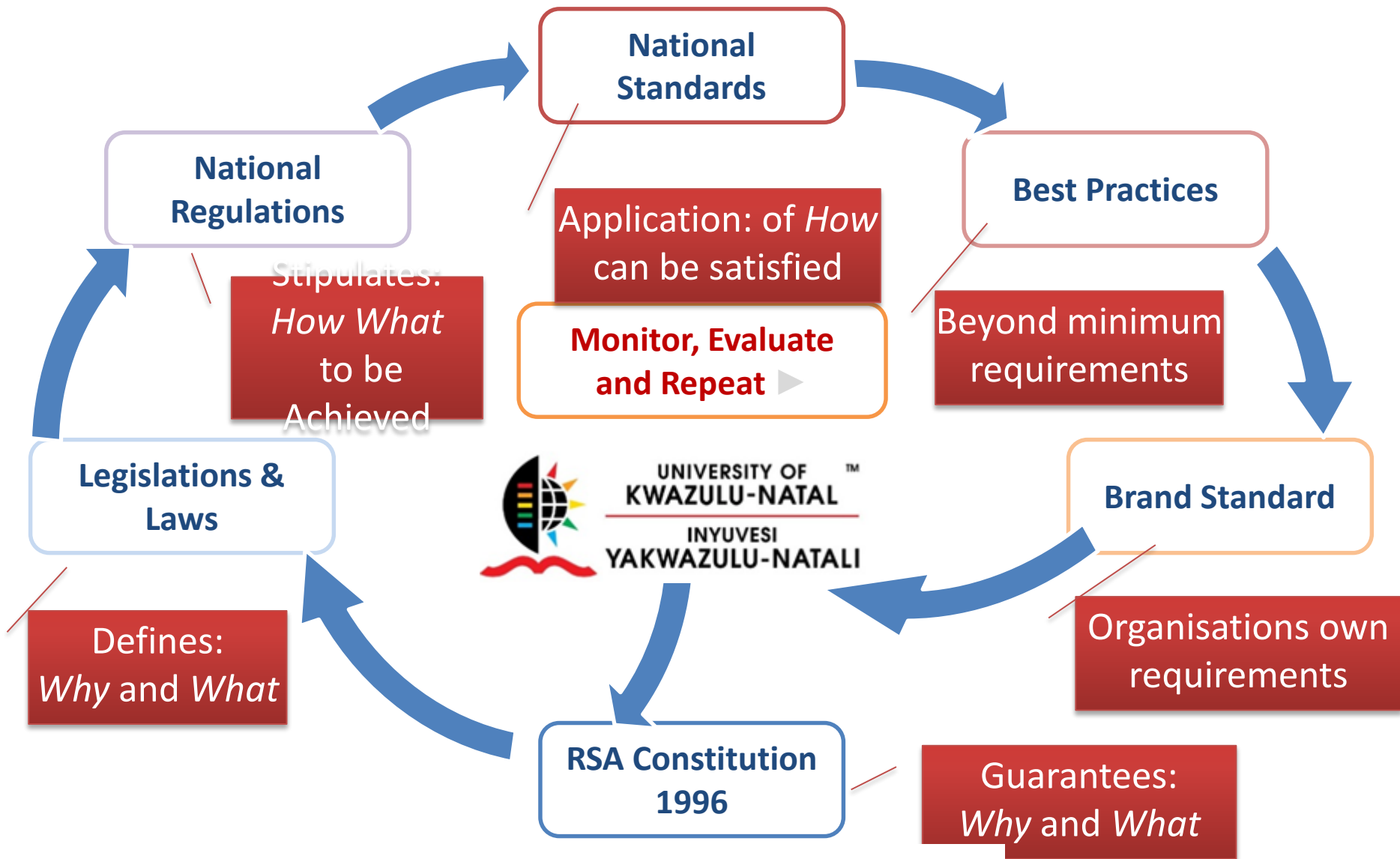
- (a) The provision of education by a "school" as defined in the South African Schools Act, 1996, (Act No. 84 of 1996).
- (b) The provision of "higher education" by a "higher education institution" as defined in terms of the Higher Education Act, 1997, (Act No. 101 of 1997).
- (c) "Adult basic education and training", as defined in the Adult Basic Education and Training Act, 2000, (Act No. 52 of 2000), including literacy and numeracy education.
- (d) "Further education and training" provided by a "public college" or "private college" as defined in the Further Education and Training Colleges Act, 2006 (Act No. 16 of 2006), which is registered in terms of that Act.
- (e) Training for unemployed persons with the purpose of enabling them to obtain employment.
- (f) The training or education of persons with a severe physical or mental disability.
- (g) The provision of bridging courses to enable educationally disadvantaged persons to enter a higher education institution as envisaged in subparagraph (b).
- (h) The provision of educare or early childhood development services for pre-school children.
- (i) The provision of school buildings or equipment for public schools and educational institutions engaged in public benefit activities contemplated in subparagraphs (a) to (h).
- (j) Programmes addressing needs in education provision, learning, teaching, training, curriculum support, governance, whole school development, safety and security at schools, pre-schools or educational institutions as envisaged in subparagraphs (a) to (b).
- (k) Educational enrichment, academic support, supplementary tuition or outreach programmes for the poor and needy.
- (l) Training of persons employed in the national, provincial and local spheres of government, for purposes of capacity building in those spheres of government.
- (m) Career guidance and counseling services provided to persons attending any school or higher education institution as envisaged in subparagraphs (a) and (b).

Compliance Requirements

A glimpse into the applicable

Statutory Laws and **Regulations**

1. Introduction – Compliance Cycle



1.1 Introduction – Business Cycle?



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- Business Plan alignment?
- Risks Management?

Business of Education

- Compliant?
- Adding value to clients?
- Leading?

Empowered by various legislation

- Rights not violated?
- Required obligations satisfied?

Serve the Public

1.2 Introduction – Risk Areas wrt: Serving the Public



- Rights not violated?
- Required obligations satisfied?

Serve the
Public

The Bill of Rights, ffg. Sections (amongst others):

9. Equality

10. Human dignity,

12. Freedom and security of the person,

14. Privacy,

24. Environment,

29. Education,

And all other relevant sections...

Are we at risk of violating anyone's rights?

1.3 Introduction – Risk Areas wrt: Legislations, Laws, Rules



- Compliant ?
- Adding value to clients?
- Leading?

Empowered
by various
legislation

Legislations, Laws, Rules, Best Practices:

- ✓ Companies Act,
- ✓ Labour Relations Act,
- ✓ Occupational, Health and Safety Act,
- ✓ NBR and Standards Act,
- ✓ Protection of Personal Information Act,
- ✓ All other relevant Acts...

*Is compliance a paper exercise or part of
our culture?*

1.4 Introduction – Risk Areas wrt: Business Risks: External & Internal

- Business Plan alignment?
- Risks Management?

Business of Education

Business Risks: External & Internal:

- ✓ Business Plan (*Living Document*):
 - ✓ (What, Why, How, Who, When, Where),
 - ✓ Risk Management – Policy, Procedures, Plans,
- ✓ Business Risk and Impact Analysis,
 - ✓ External Risks:
 - ✓ Legislative, Environment, Market...
 - ✓ Internal Risks:
 - ✓ Ownership, Values, Culture

Continued Growth and Success? ▶

1.5 Introduction – Some Risks: **DO we Pass**



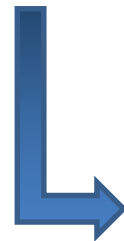
Business of Education

- Business Plan alignment? **X?**
- Risks Management **X?**



Empowered by various legislation

- Compliant? **X**
- Adding value to clients? **?**
- Leading? **?**



Serves the Public

- Rights not violated? **X**
- Required obligations satisfied? **X**

1.6 Some points of Opportunity...



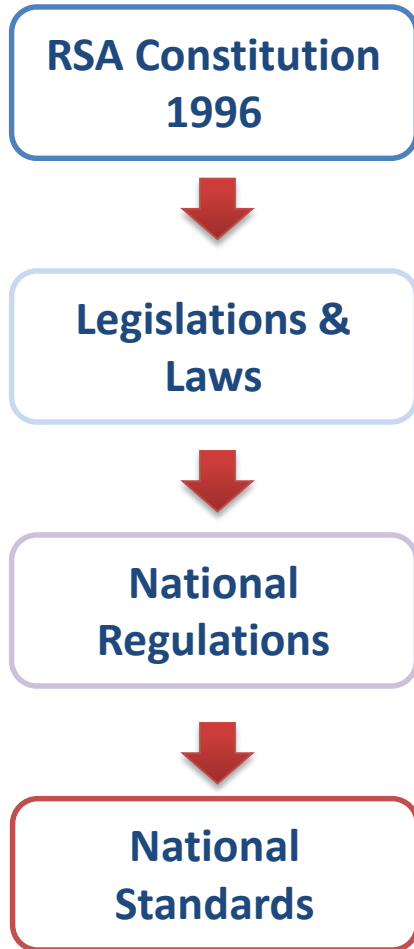
- ✓ Occupational Health and Safety, Act 85 1993,
- ✓ National Building Regulations and Building Standards Act No. 103 Of 1977

How?

A time targeted functional first with compliance finish programme:

Alignment and Compliance ►

1.7 Introduction – National Standards



- SANS 10400 – All Parts
- BS 7974 – Relevant Parts
- SANS 10142-1: Electrical Code,
- SANS 10139: Fire Detection,
- ISO 13943: Fire Safety Vocabulary
- SANS 7240-16 and 19: Voice Evacuation
- All other normative and relevant standards

4.2.1 OHS Act 1993: **Employer Duties**

*8. General duties of employers to their employees:

“1. Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of his employees.”

** This section is quite extensive ►*

4.2.2 OHS Act 1993: **Employer Duties**

8. General duties of employers to their *employees*:

“2. Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular –

e. providing such information, instructions, training and supervision as may be necessary to ensure, as far as is reasonably practicable, the health and safety at work of his employees;” ►

4.3 OHS Act 1993: **Employer Duties**

9. General duties of employers and self-employed persons to persons *other than their employees*:

“1. Every employer shall conduct his undertaking in such a manner as to ensure, as far as is reasonably practicable, that persons other than those in his employment who may be directly affected by his activities are not thereby exposed to hazards to their health or safety.” ►

4.4.1 OHS Act 1993: **Employee's Duties**

* 14. General duties of *employees* at work:

*“Every **employee** shall at work –*

a. take reasonable care for

the health and safety of himself and

*of other persons who may be affected by his **acts or omissions**;*

** This section is quite extensive ►*

4.4.2 OHS Act 1993: **Employee's Duties**

14. General duties of employees at work:

Every **employee** shall at work –

d. if any situation which is **unsafe or unhealthy** comes to **his attention**,

as soon as practicable **report such situation to his employer**,

or to the **health & safety representative** for his workplace or section thereof,

as the case may be,

who should report it to the **employer**;" ►

Compliance Requirements

SA Constitution

Environment

24. Everyone has the right—

(a) to an environment that is not harmful to their health or wellbeing; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that—

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Compliance Requirements

SA Constitution

Access to information

32. (1) Everyone has the right of access to—

(a) any information held by the state; and

(b) any information that is held by another person and that is required for the exercise or protection of any rights.

(2) National legislation must be enacted to give effect to this right, and may provide for reasonable measures to alleviate the administrative and financial burden on the state.

Compliance Requirements

Air quality

Government Notice. R: 2281, 16 October 1987, Environmental Regulations for Workplaces, 1987

5. (1) An employer shall ensure that every workplace in his undertaking is ventilated either by natural or mechanical means in such a way that -

- (a) the air breathed by employees does not endanger their safety;
- (b) the time-weighted average concentration of carbon dioxide therein, taken over an eight-hour period, does not exceed one half per cent by volume of air;
- (c) the carbon dioxide content thereof does not at any time exceed three per cent by volume of air;
- (d) the prescribed exposure limits for airborne substances therein are not exceeded;**

Compliance Requirements

Air quality

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