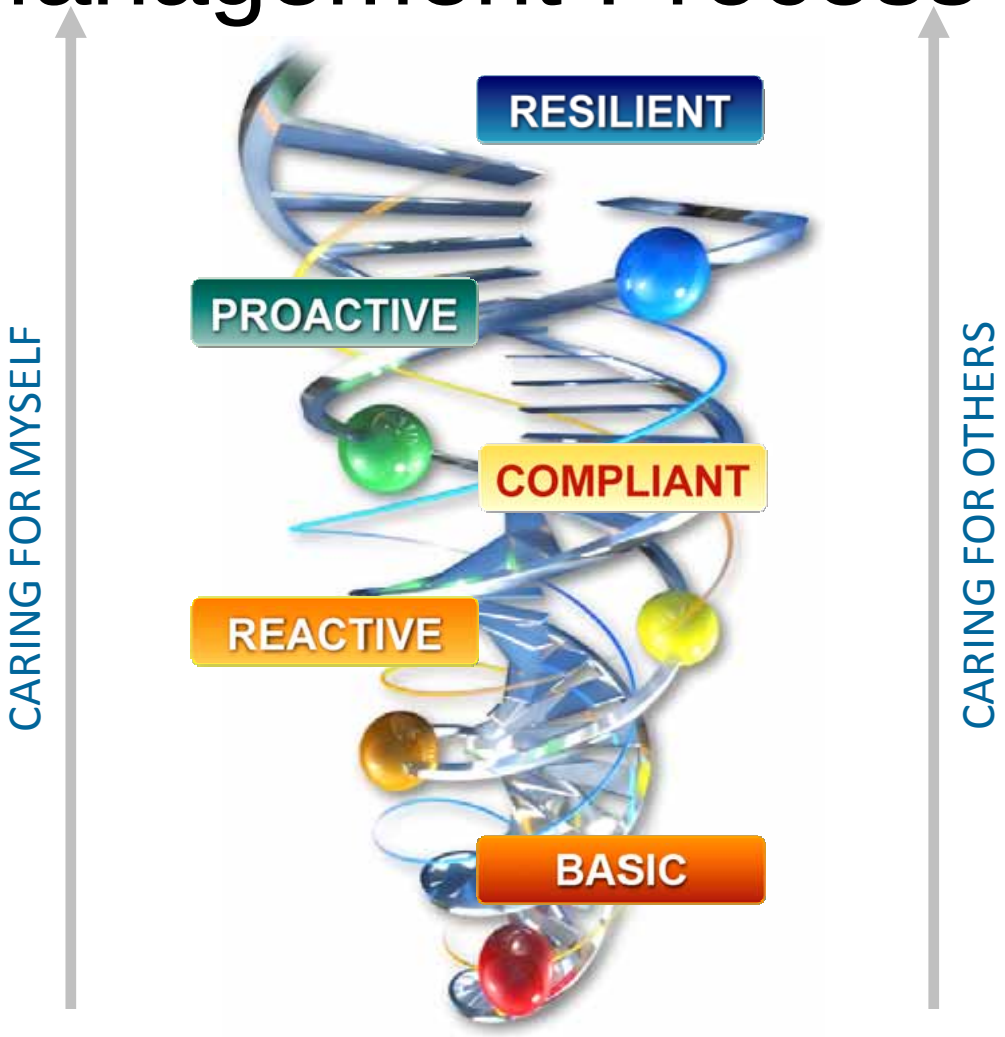
The Anglo Safety Risk Management Process

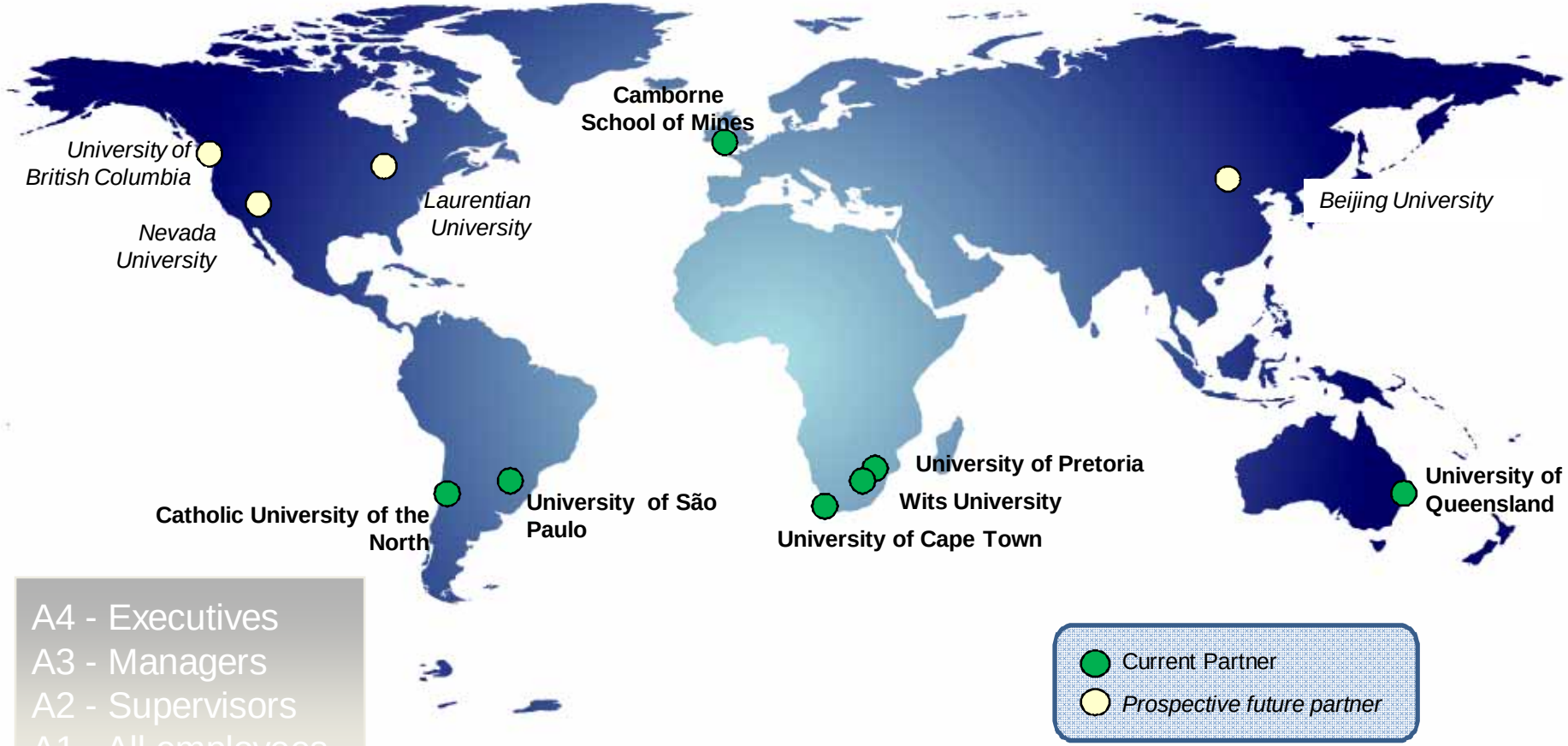


Commitment from the top

- ‘A’ courses initiated to improve safety performance
- Everyone in Anglo is involved
- Now the detailed strategy has been refined
- The focus is Safety, Health and the Environment

University Partnership: A Global Presence

7 active university partners in 5 countries



A4 - Executives
A3 - Managers
A2 - Supervisors
A1 - All employees

Concepts and Terminology

The words

- Proactive and Reactive Decisions
- Risks and Decisions
- Energies
- Hazard
- Unwanted Event / Incident
- Risk
- Controls / Barriers / Defences
- Risk Management
- Risk Assessment Tools
- Risk Analysis Techniques

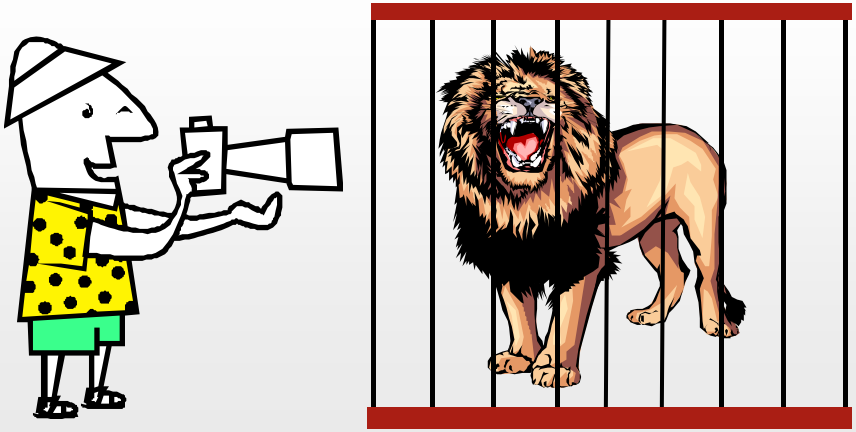
Sensible Risk Management

Remember that Hazard
(anything that can cause harm)

is not the same as Risk
(likelihood that harm will occur and its severity)

High Risk

Low risk



Decisions & Risk Management

STRATEGIC

formal risk assessment

TACTICAL

informal risk assessment, ‘rules’

OPERATIONAL

learned ‘safety’

Understanding Why

- **ATTITUDE**
- **MOTIVATION**
- **BEHAVIOUR**

Types of Human Errors

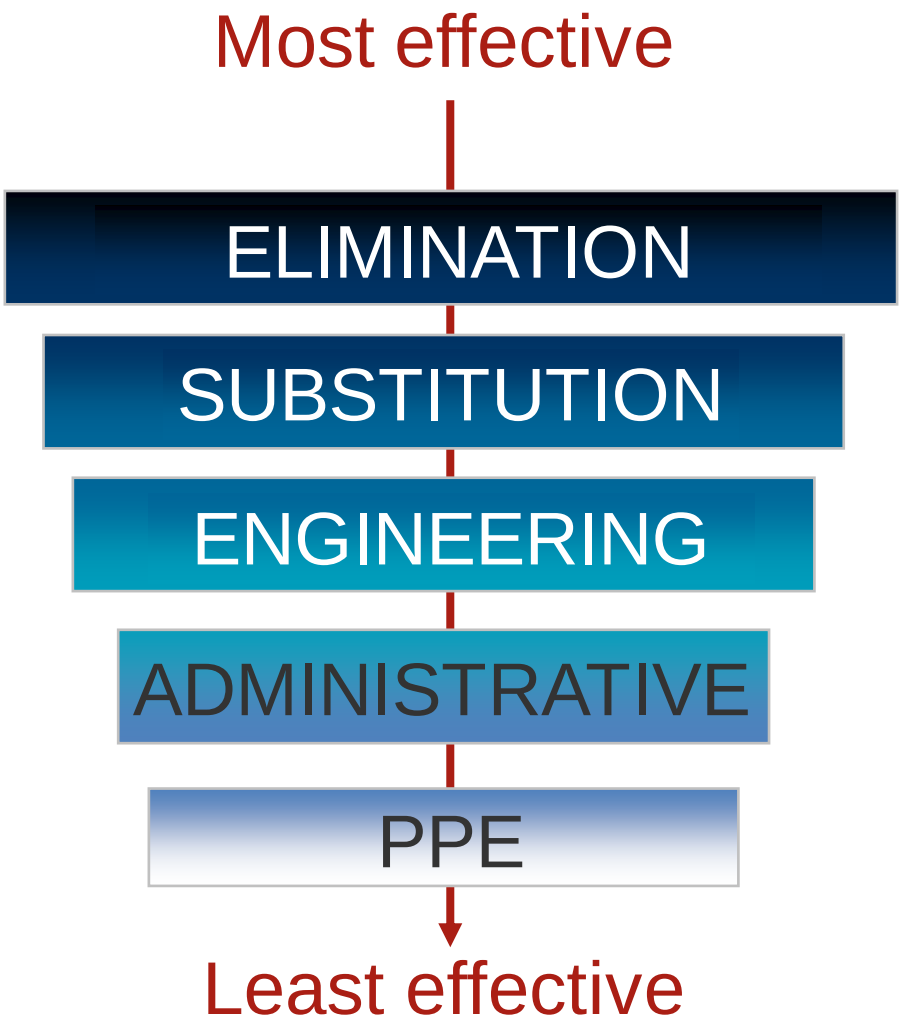
UNINTENTIONAL

- Slips / Lapses
  - Lapses of attention; inadvertent omissions, natural human limitations
- Mistakes
  - Lack of knowledge to select the appropriate plan of action

- Violations
  - Deviation from the understood and accepted normal practice for whatever reason
  - Routine or Exceptional

James Reason

The Hierarchy of Controls:



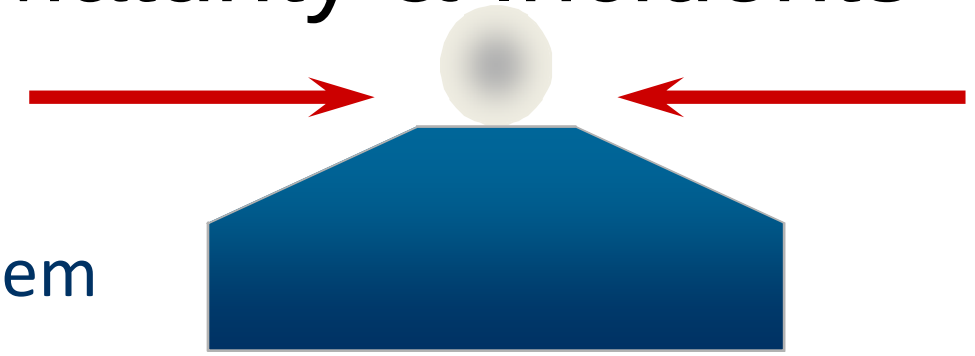
Human Factors Engineering

- Accessibility
- Work Space/Posture
- Manual Handling
- Visibility
- Controls
- Displays
- Work Environment

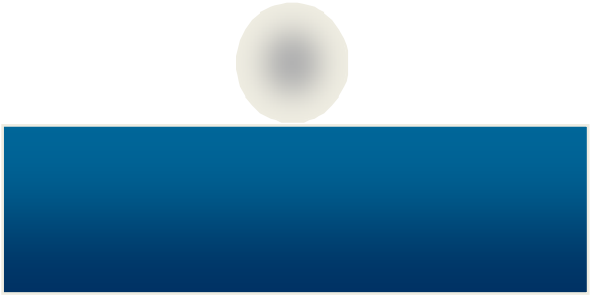
The Work Process

Organisation Maturity & Incidents

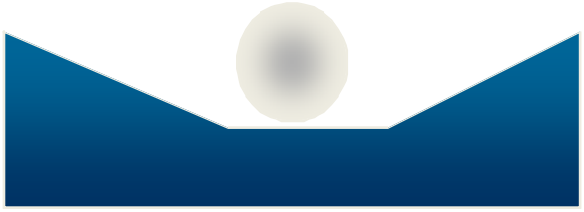
Vulnerable system



Compliance system



Resilient system



Models for Improvement

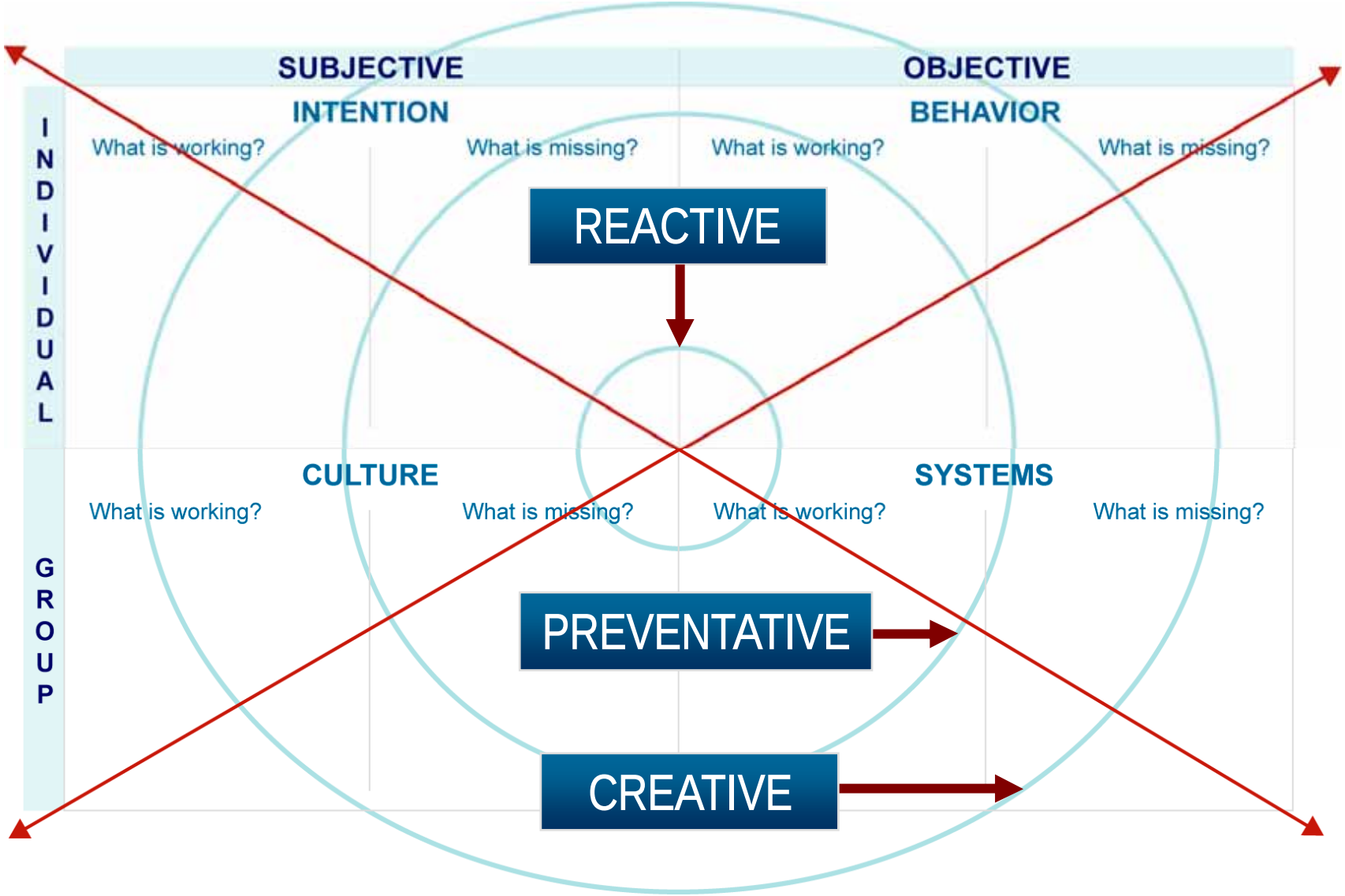
Considering Anglo's History

- Bradley
- JMJ
- Anglo SRM Process

Bradley Curve: SHE Culture Model

- Stage Three – Interdependent Phase

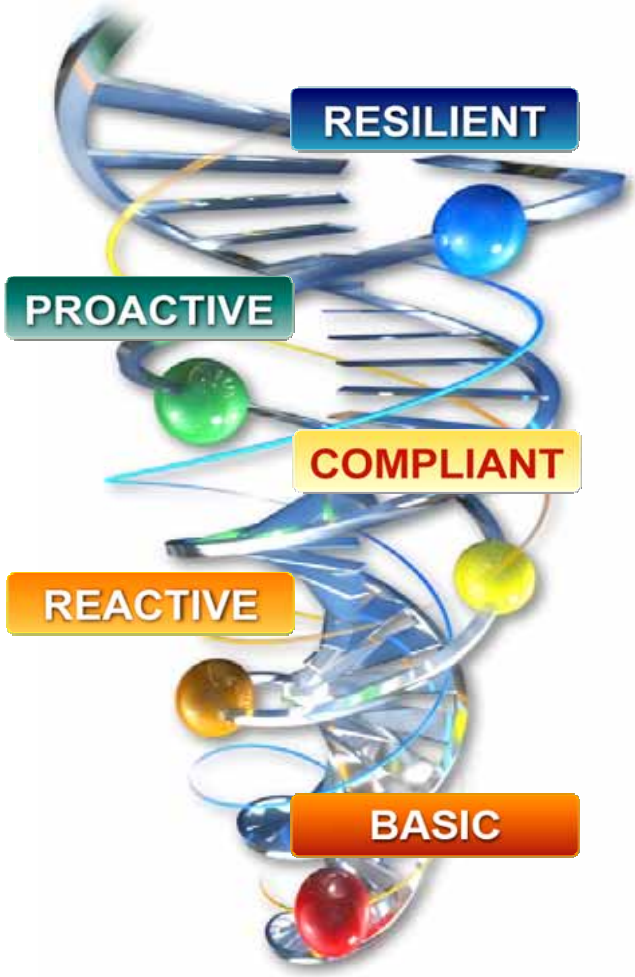
JMJ Integral Analysis Benchmark



The Anglo Safety Risk Management Process

PEOPLE

P1. Personal Risk Attitude
P2. Caring & Recognition
P3. Management Leadership and Commitment
P4. Safety Accountability
P5. Employee Involvement and Consultation
P6. Coaching and Mentoring



SYSTEMS

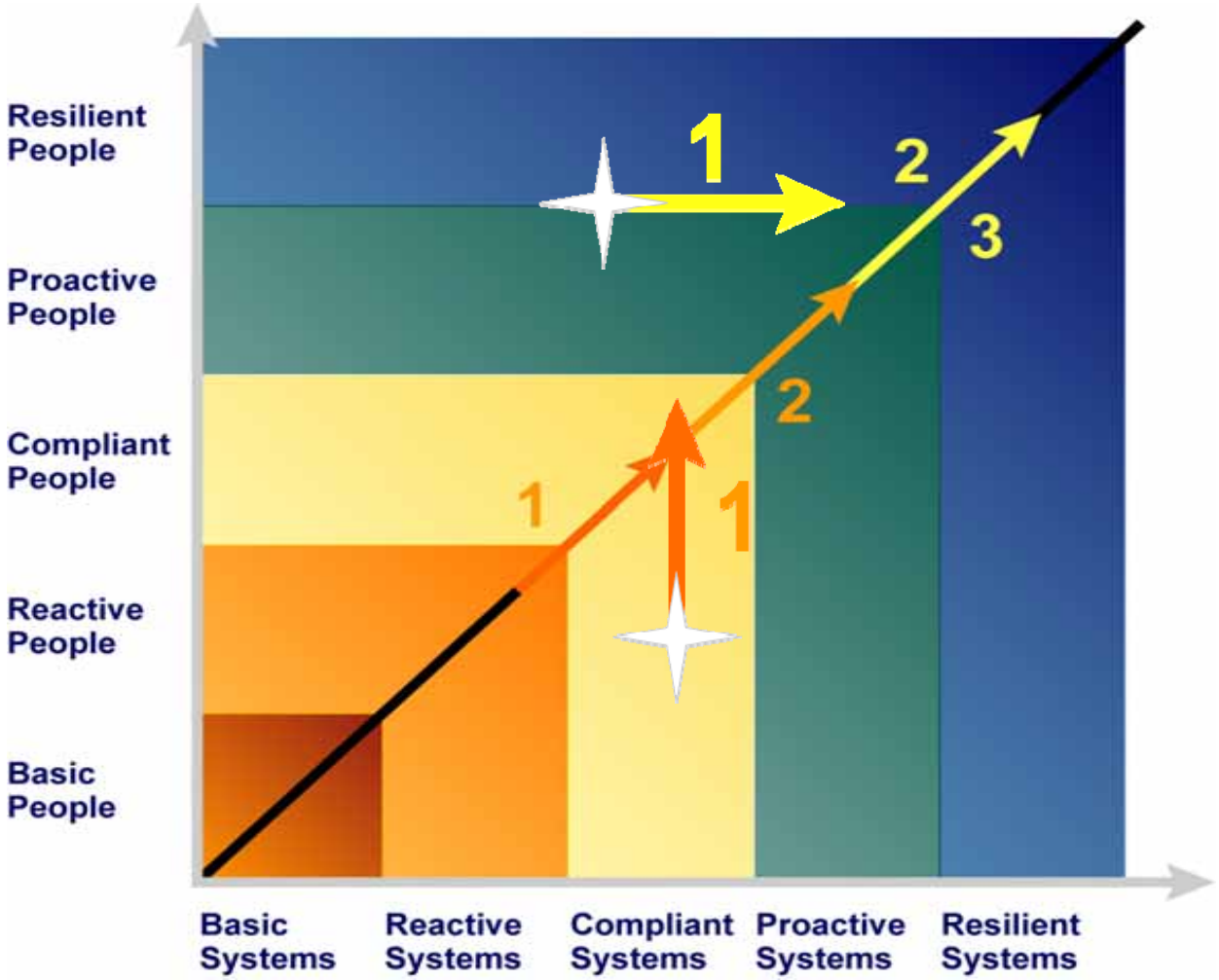
S1. Risk Management Adoption
S2. Strategic Planning
S3. Project & Process Design Management
S4. Major Hazard / Priority Risk Identification and Management
S5. Change Management
S6. Job and Task Planning
S7. Hazard Identification and Reporting
S8. Training and Competency
S9. Communications
S10.Knowledge Management
S11.Maintenance
S12.Procurement
S13.Contractor Management
S14 .Incident Investigation and Analysis
S15. Emergency Response
S16. Safety Performance Measurement
S17. Auditing and Monitoring

The Anglo SHE RMP – Self Assessment Tool

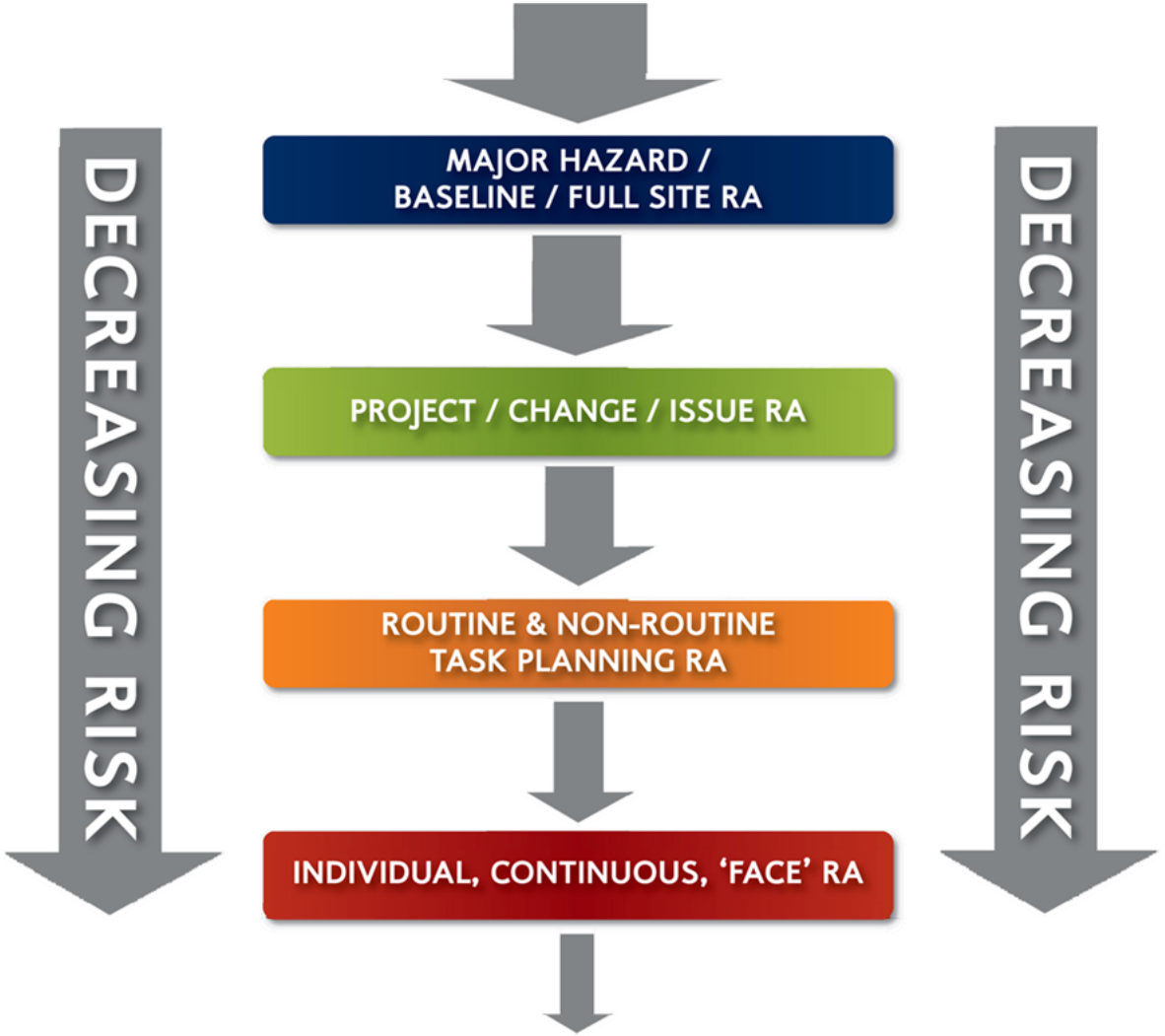
	BASIC	REACTIVE	COMPLIANT	PROACTIVE	RESILIENT
	Little formal interest, exposed, regressive, vulnerable, starters	**Responsive, awareness**	**Preventative, compliance, understanding**	**Competent**	**Generative, creative, excellence**
P1. Personal Risk Attitude 'caring for myself'	The safety risks in the mining industry are accepted as a necessary consequence and the person has a fatalistic outlook. This is often expressed as 'mining is tough, people get killed'.	Risks and the need to control them are recognised, but the person doesn't perceive themselves to be exposed. They tend to state 'It won't happen to me'.	The person will follow specified procedures except when production is at stake. There is an acceptance of shortcuts, as long as nothing happens. 'I follow the procedures and rules when I know someone is watching me'.	The person doesn't wilfully put themselves in danger, and follows procedure at all times. Shortcuts are not seen as an option. 'I follow the procedures because I want to'.	The person will not carry out a task if unsafe, even if procedure allows it. Safety is a value; it is no longer seen as a competing priority. All people express this as 'This is just the way I do things'.

* – 'employees' refers to Anglo American and contractor personnel

The Anglo Safety Risk Management Process

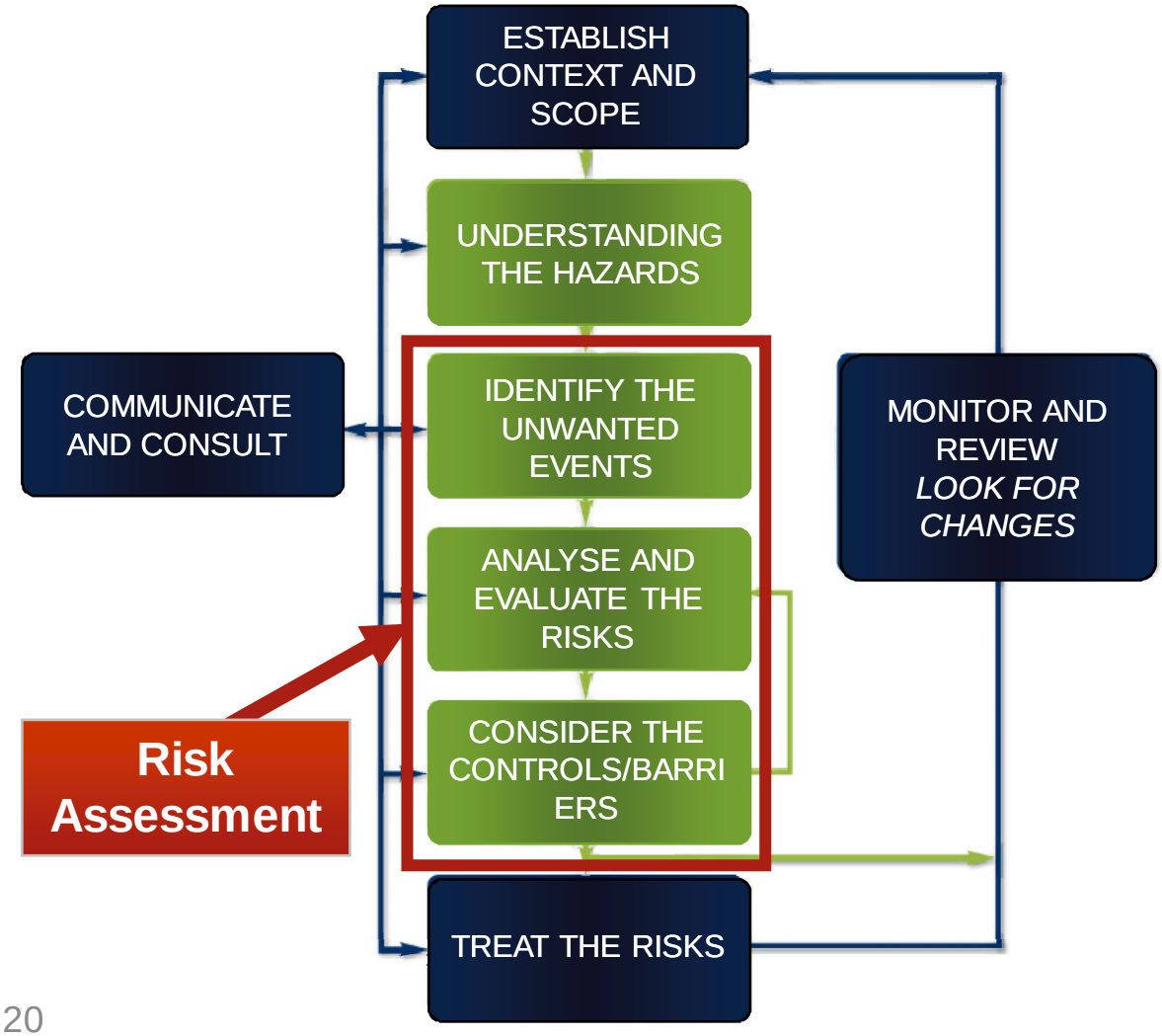


‘4 Layer’ Risk Assessment (RA) and Management



The Minerals Industry Risk Management Process

(modified version of AS4360:2004)



An approach is required to apply this process in a mine, minerals processing plant, major project or function.

Risk Assessment Tools

- JSA – Job Safety Analysis
- WRAC – Workplace Risk Assessment & Control
- FMEA – Failure Modes, Effects & Criticality Analysis
- HAZOP – Hazard & Operability Assessment
- Fault / Logic Tree Analysis
- Event Tree Analysis
- Bow Tie Analysis
- QRA - Quantitative Risk Assessment

Which ones do we use now?

Anglo American SHE Risk Matrix

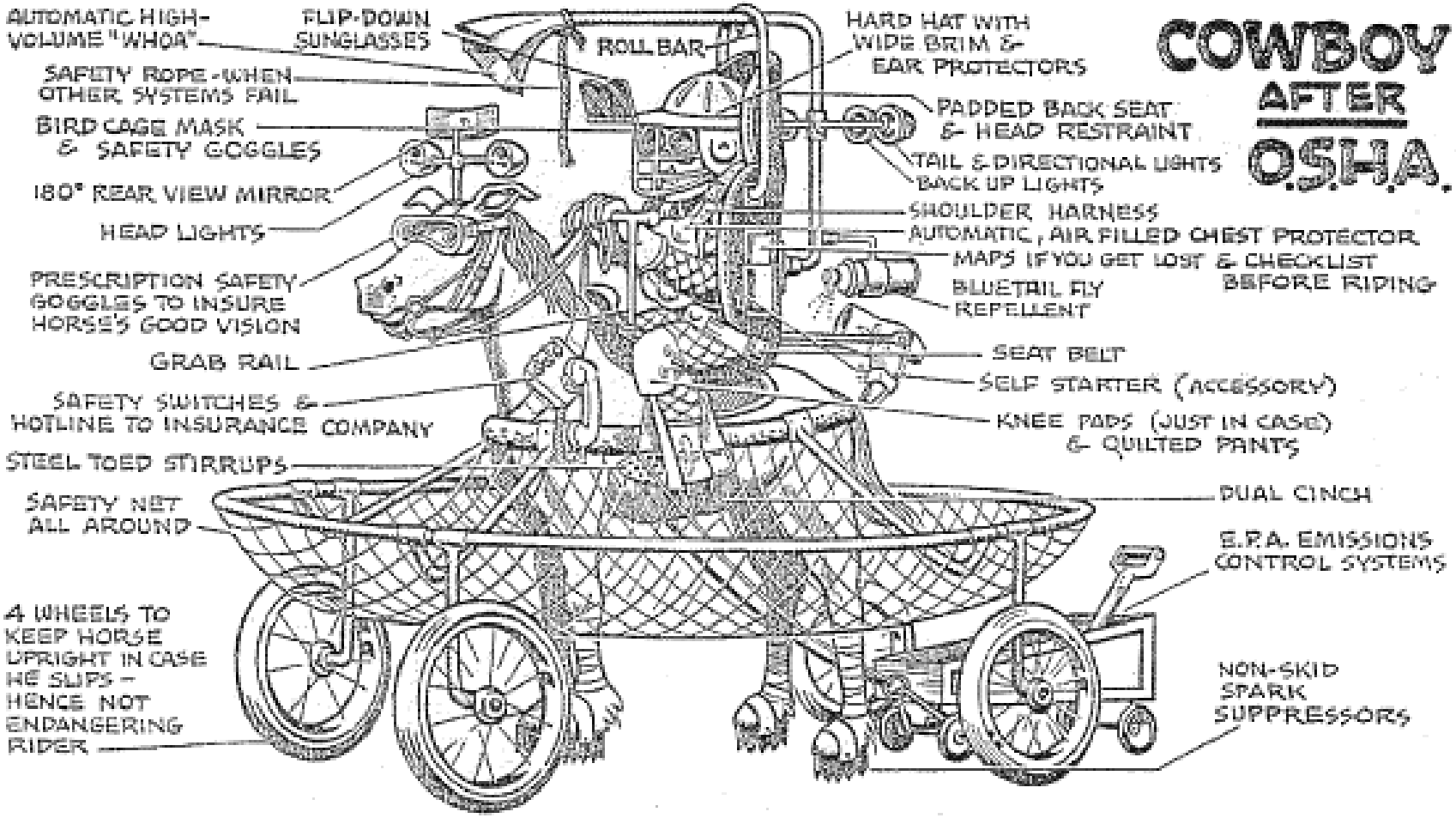
to find the priorities

Event Risk Rating / Priority (1)					
Consequence / Likelihood	**1 Minor**	**2 Low**	**3 Medium**	**4 High**	**5 Major**
5 Almost Certain	**Medium** (11)	**Significant** (16)	**Significant** (20)	**High** (23)	**High** (25)
4 Likely	**Medium** (7)	**Medium** (12)	**Significant** (17)	**High** (21)	**High** (24)
3 Possible	**Low** (4)	**Medium** (8)	**Significant** (13)	**Significant** (18)	**High** (22)
2 Unlikely	**Low** (2)	**Low** (5)	**Medium** (9)	**Significant** (14)	**Significant** (19)
1 Rare	**Low** (1)	**Low** (3)	**Medium** (6)	**Medium** (10)	**Significant** (15)

(1) Risk rating does not indicate risk acceptability; all risks should be reduced to ALARP (as low as reasonably practicable).

Bow Tie Analysis Model

How much control is enough?



“Stop & Think” Risk Acceptability?