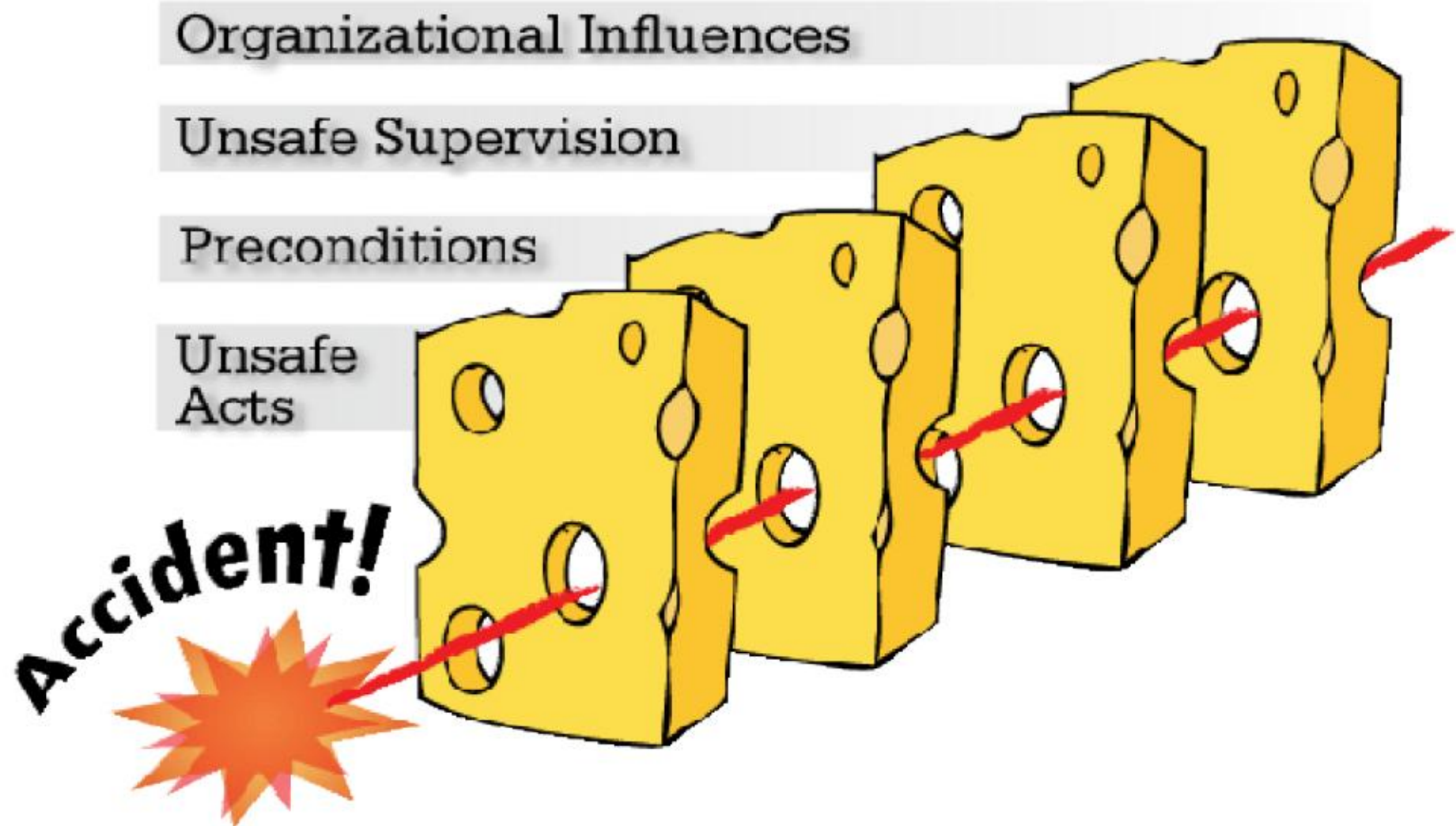
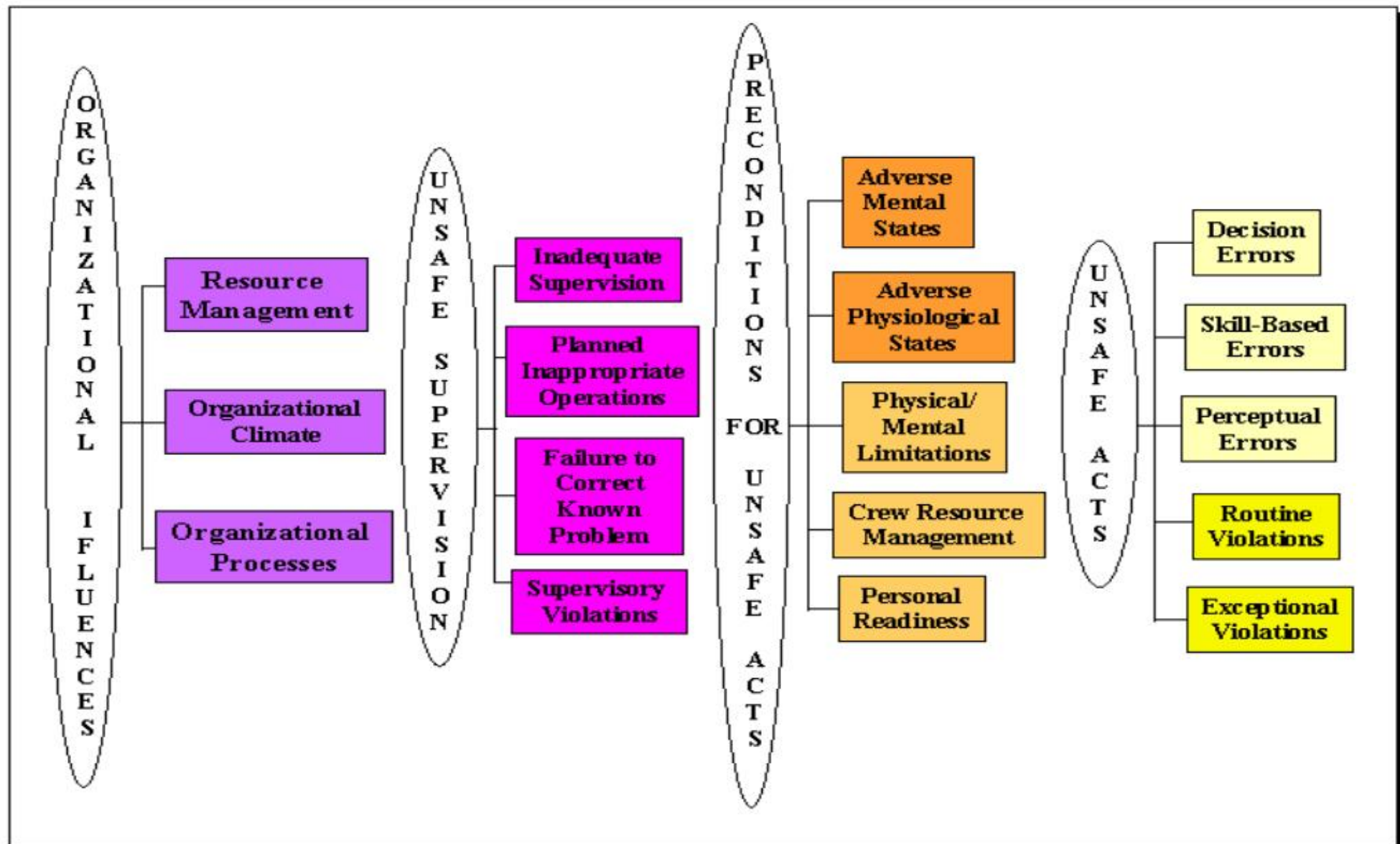


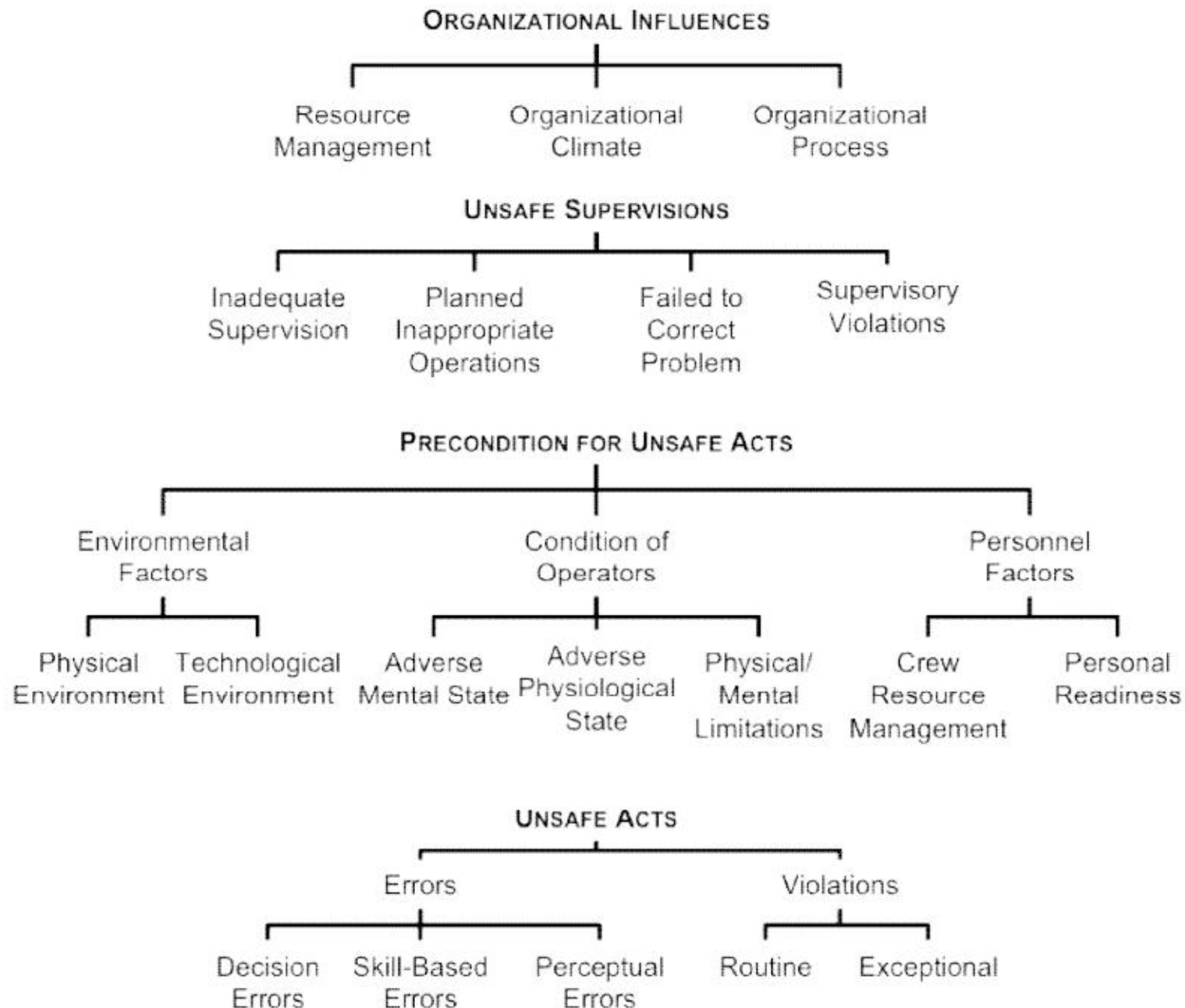
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Extract of unsafe acts taxonomy (adapted from Wiegmann & Shappell, 2003).

Extract of preconditions of unsafe acts taxonomy (adapted from Wiegmann & Shappell, 2003).

ERRORS	VIOLATIONS
<p><i>Skill-based Errors</i></p> <ul style="list-style-type: none"> • Breakdown in visual scan • Inadvertent use of flight controls • Poor technique/airmanship • Over-controlled the aircraft • Omitted checklist item • Omitted step in the procedure • Over-reliance on automation • Failed to prioritise attention • Task overload • Negative habit • Failure to see and avoid • Distraction 	<p><i>Routine</i></p> <ul style="list-style-type: none"> • Inadequate briefing for flight • Failed to use ATC radar advisories • Flew an unauthorised approach • Violated training rules • Filed VFR in marginal weather conditions • Failed to comply with departmental manuals • Violation of orders, regulations, SOPS • Failed to inspect aircraft after in-flight caution light
<p><i>Decision Errors</i></p> <ul style="list-style-type: none"> • Inappropriate maneuver/procedure • Inadequate knowledge of systems, procedures • Exceeded ability • Wrong response to emergency 	<p><i>Exceptional</i></p> <ul style="list-style-type: none"> • Performed unauthorized acrobatic maneuver • Improper takeoff technique • Failed to obtain valid weather brief • Exceeded limits of aircraft • Failed to complete performance computations for flight • Accepted unnecessary hazard • Not current/qualified for flight • Unauthorised low-altitude canyon running
<p><i>Perceptual Errors</i></p> <ul style="list-style-type: none"> • Due to visual illusion • Due to spatial disorientation/vertigo • Due to misjudged distance, altitude, airspeed, clearance 	

CONDITION OF OPERATOR	PERSONNEL FACTORS
<p><i>Adverse Mental States</i></p> <ul style="list-style-type: none"> • Loss of situational awareness • Complacency • Stress • Overconfidence • Poor flight vigilance • Task saturation • Alertness (drowsiness) • Get-home-itis • Mental fatigue • Circadian dysrhythmia • Channelised attention • Distraction <p><i>Adverse Physiological States</i></p> <ul style="list-style-type: none"> • Medical illness • Hypoxia • Physical fatigue • Intoxication • Motion sickness • Effects of OTC medications <p><i>Physical/Mental Limitations</i></p> <ul style="list-style-type: none"> • Visual limitations • Insufficient reaction time • Information overload • Inadequate experience for complexity of situation • Incompatible physical capabilities • Lack of aptitude to fly • Lack of sensory input 	<p><i>Crew Resource Management</i></p> <ul style="list-style-type: none"> • Failed to conduct adequate brief • Lack of teamwork • Lack of assertiveness • Poor communication/co-ordination within and between aircraft, ATC, etc. • Misinterpretation of traffic calls • Failure of leadership <p><i>Personnel Readiness</i></p> <ul style="list-style-type: none"> • Failure to adhere to crew rest requirements • Inadequate training • Self-medicating • Overexertion while off duty • Poor dietary practices • Pattern of poor risk judgement <p>ENVIRONMENTAL FACTORS</p> <p><i>Physical Environment</i></p> <ul style="list-style-type: none"> • Weather • Altitude • Terrain • Lighting • Vibration • Toxins in the cockpit <p><i>Technological Environment</i></p> <ul style="list-style-type: none"> • Equipment/controls design • Checklist layout • Display/Interface characteristics • Automation

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Unsafe supervision examples (adapted from Wiegmann & Shappell, 2003).

Organisational influences extract (adapted from Wiegmann & Shappell, 2003).

Unsafe Supervision	
<p><i>Inadequate supervision</i></p> <ul style="list-style-type: none"> Failed to provide proper training Failed to provide professional guidance/oversight Failed to provide current publications/adequate technical data and/or procedures Failed to provide adequate rest period Lack of accountability Perceived lack of authority Failed to track qualifications Failed to track performance Failed to provide operational doctrine Over-tasked/untrained supervisor Loss of supervisory situational awareness <p><i>Planned Inappropriate Operations</i></p> <ul style="list-style-type: none"> Poor crew pairing Failed to provide adequate brief time/supervision Risk outweighs benefit Failed to provide adequate opportunity for crew rest Excessive tasking/workload 	<p><i>Failed to Correct a Known Problem</i></p> <ul style="list-style-type: none"> Failed to correct inappropriate behaviour/identify risky behaviour Failed to correct a safety hazard Failed to initiate corrective action Failed to report unsafe tendencies <p><i>Supervisory Violations</i></p> <ul style="list-style-type: none"> Authorised unqualified crew for flight Failed to enforce rules and regulations Violated procedures Authorised unnecessary hazard Willful disregard for authority by supervisors Inadequate documentation Fraudulent documentation

Organisational Influences	
<p><i>Resource Management</i></p> <p><i>Human Resources</i></p> <ul style="list-style-type: none"> Selection Staffing/manning Training Background checks <p><i>Monetry/Budget Resources</i></p> <ul style="list-style-type: none"> Excessive cost cutting Lack of funding <p><i>Equipment/Facility Resources</i></p> <ul style="list-style-type: none"> Poor aircraft/aircraft cockpit Purchasing of unsuitable equipment Failure to correct known design flaws <p><i>Organisational Climate</i></p> <p><i>Structure</i></p> <ul style="list-style-type: none"> Chain of command Communication Accessibility/visibility of supervisor Delegation of authority Formal accountability for actions <p><i>Policies</i></p> <ul style="list-style-type: none"> Promotion Hiring, firing, retention Drugs and alcohol Accident investigations <p><i>Culture</i></p> <ul style="list-style-type: none"> Norms and rules Organisational customs Values, beliefs, attitudes 	<p><i>Organisational Process</i></p> <p><i>Operations</i></p> <ul style="list-style-type: none"> Failed to correct inappropriate behaviour/identify risky behaviour Failed to correct a safety hazard Failed to initiate corrective action Failed to report unsafe tendencies <p><i>Procedures</i></p> <ul style="list-style-type: none"> Performance standards Clearly defined objectives Procedures/instructions about procedures <p><i>Oversight</i></p> <ul style="list-style-type: none"> Established safety programs/risk management programs Management's monitoring and checking of resources, climate, and processes to ensure a safe work environment