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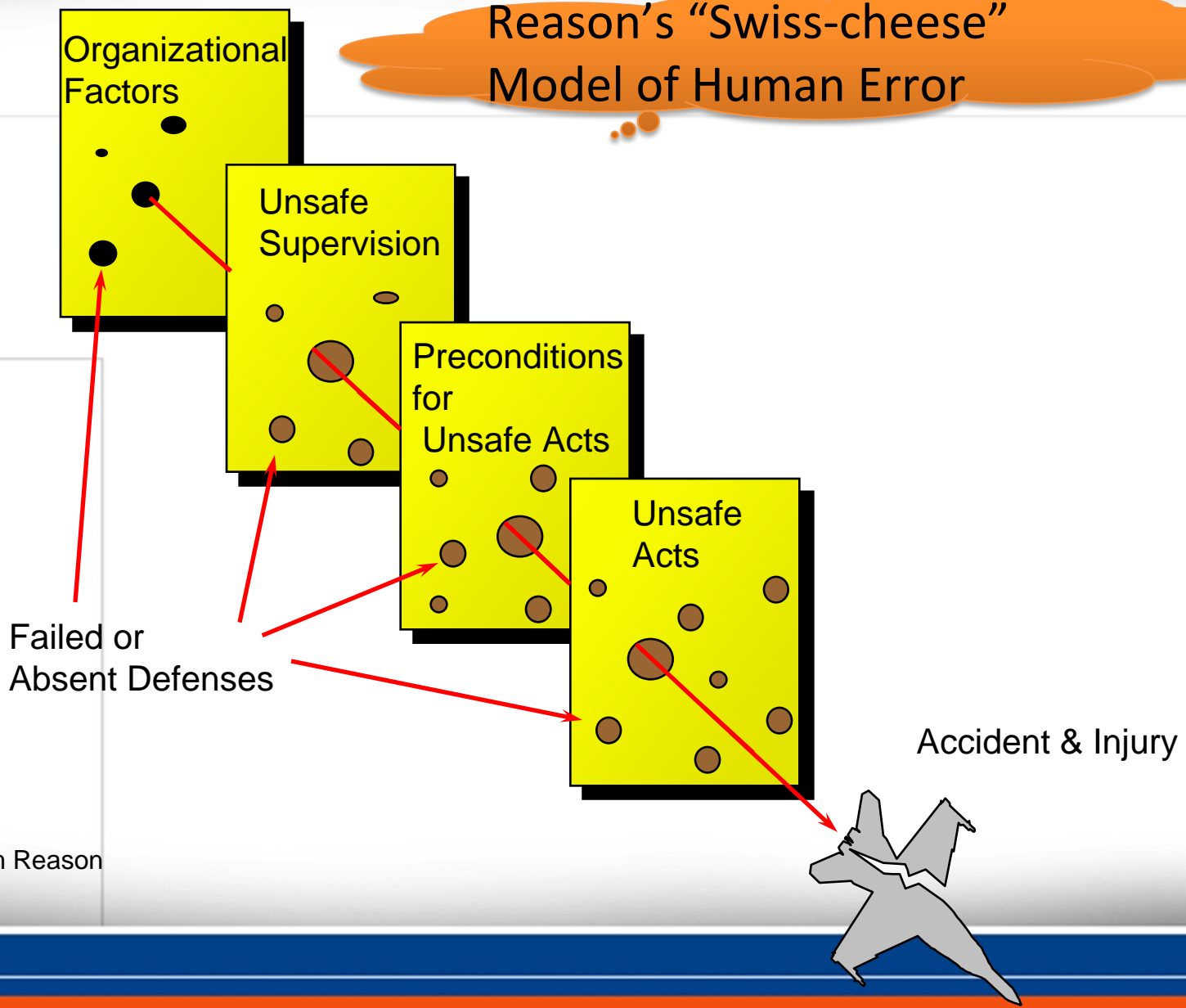
HUMAN FACTOR – Swiss Cheese Theory

**FAKTOR MANUSIA DALAM K3
PERTEMUAN 6
PUTRI HANDAYANI, SKM, MKKK
PRODI KESMAS / FIKES**

TUJUAN/CAPAIAN PEMBELAJARAN

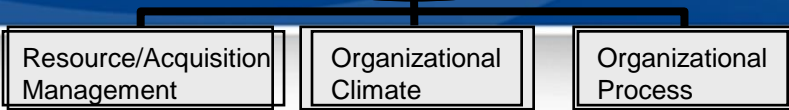
Menguraikan konsep Konsep swiss cheese model, dan
Lingkup pengamatan swiss cheese model

Reason's "Swiss-cheese" Model of Human Error

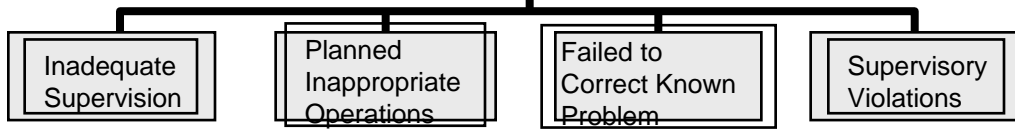


Adapted from Reason (1990)

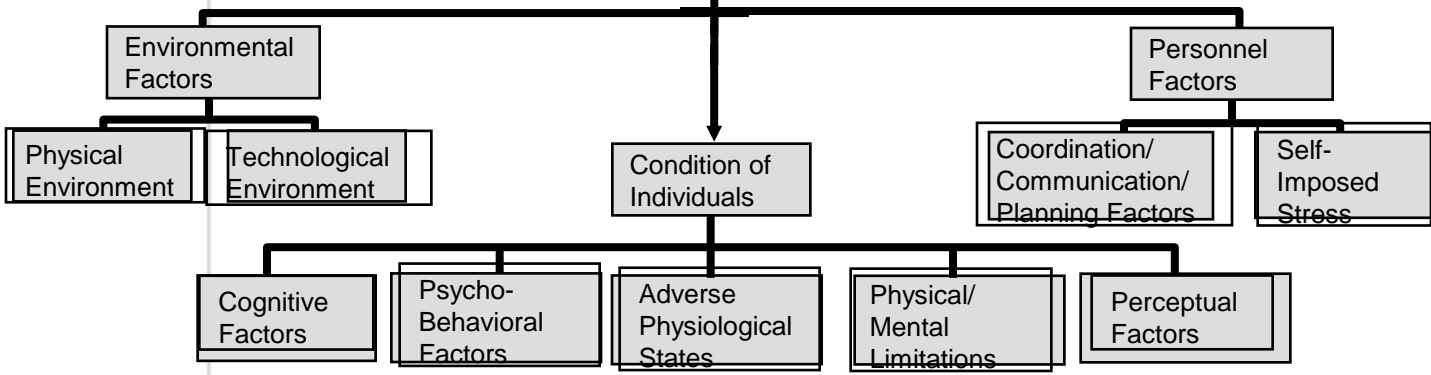
ORGANIZATIONAL INFLUENCES



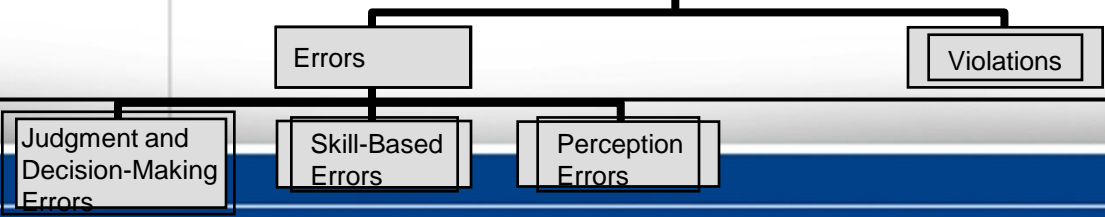
SUPERVISION



PRECONDITIONS



ACTS



Acts

The act is the end result. It answers the question of, “what happened?”



Skill-based Errors: kesalahan dalam tugas-tugas rutin-dilakukan

Decision Errors: kesalahan dalam pemilihan tindakan untuk situasi tertentu

Perception Errors: persepsi yang mengarah kepada tindakan yang tidak tepat

Violation: sengaja bertindak melawan kebijakan tertulis atau prosedur.

ACTS

Errors

Violations

Judgment and Decision
Errors

Skill-Based
Errors

Misperception
Errors

Unsafe
Acts



ACTS

Errors

Violations

Judgment and Decision Errors

Skill-Based Errors

Misperception Errors

DECISION ERRORS

- Risk Assessment – During Operation
- Task Misprioritization
- Necessary Action – Rushed
- Necessary Action – Delayed
- Caution/Warning – Ignored
- Wrong choice of action

Unsafe Acts



ACTS

Errors

Violations

Judgment and Decision
Errors

Skill-Based
Errors

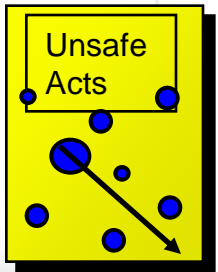
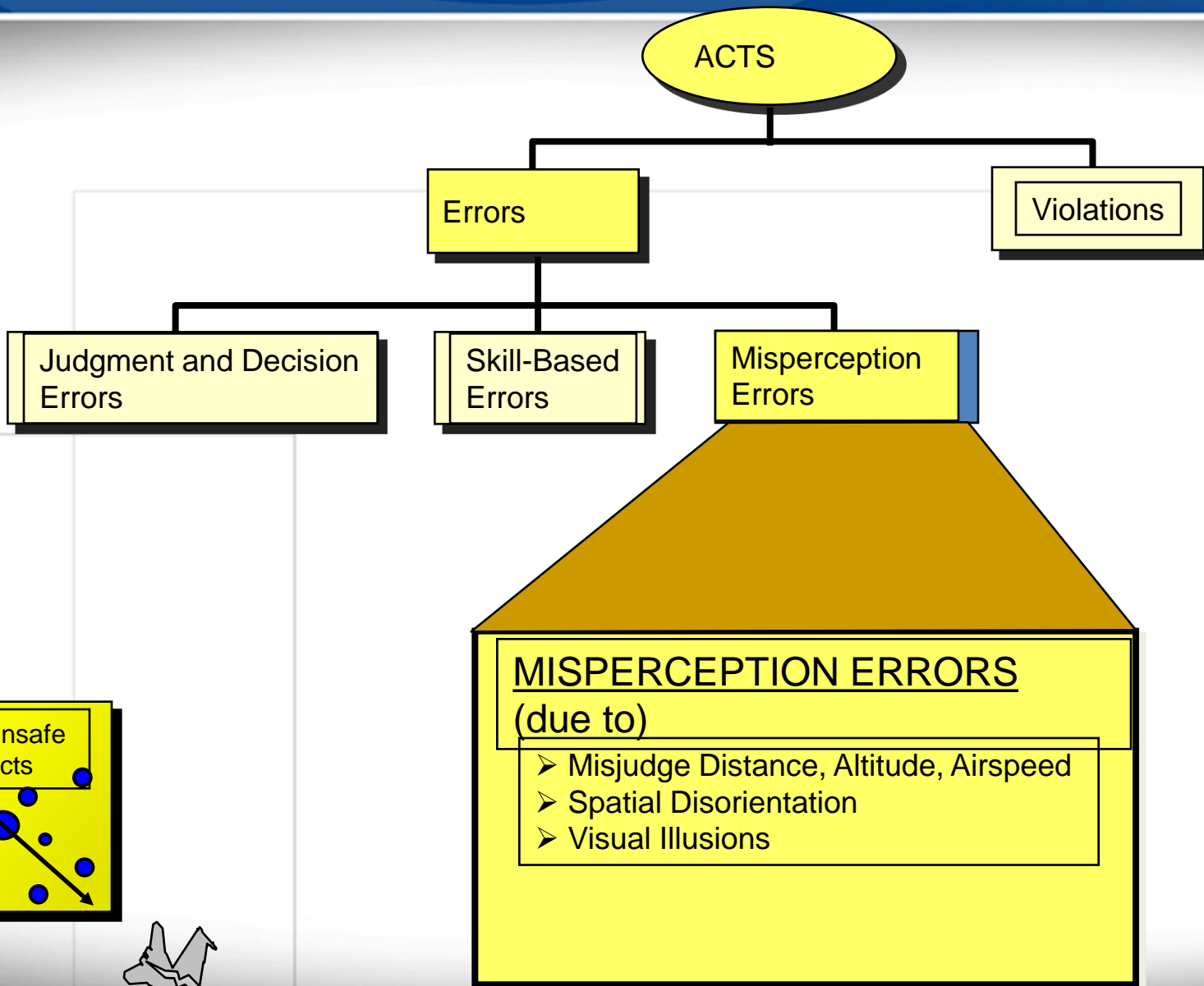
Misperception
Errors

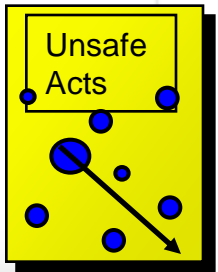
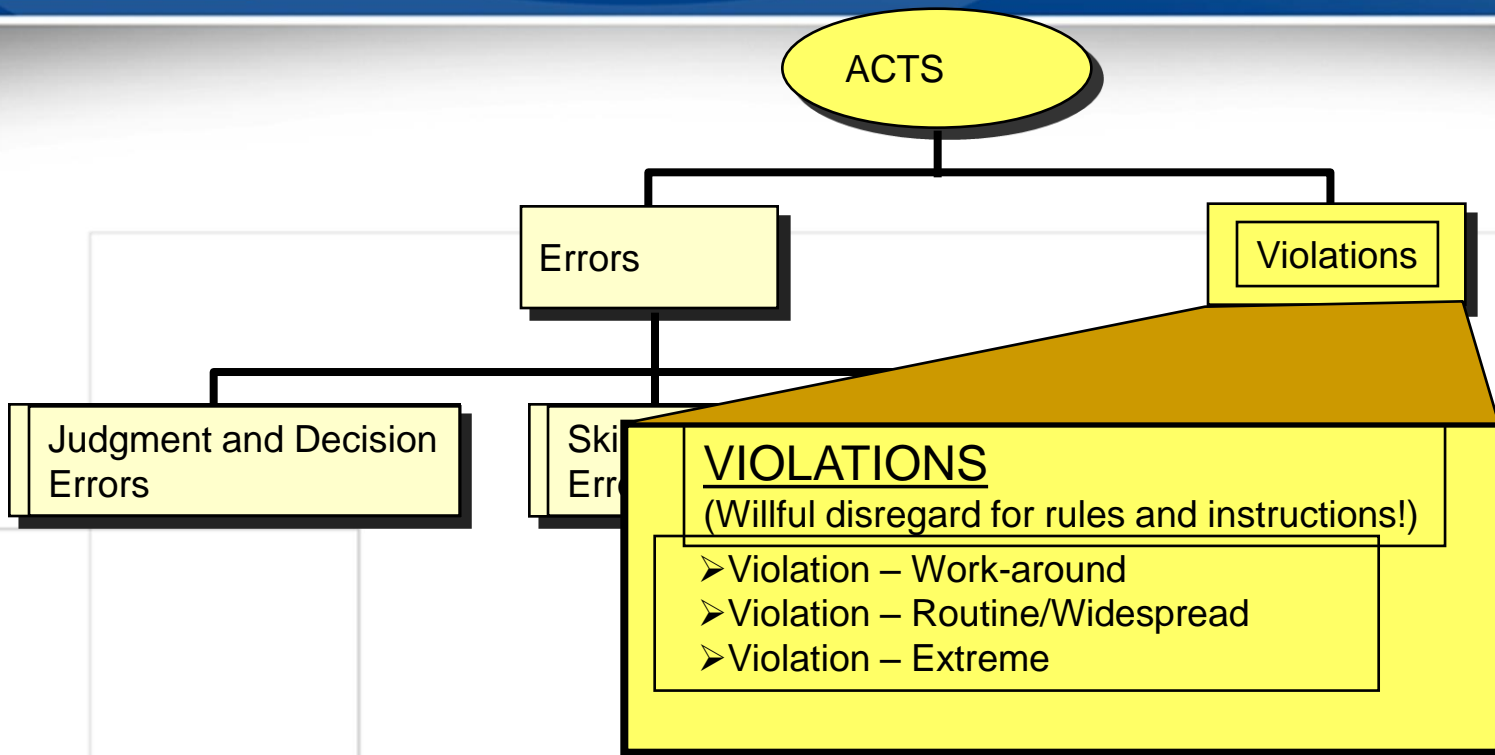
SKILL-BASED ERRORS

- Inadvertent Operation
- Checklist Error
- Procedural Error
- Overcontrol/Undercontrol
- Breakdown in Visual Scan
- Inadequate Anti-G Straining Maneuver

Unsafe
Acts







Preconditions

Prakondisi adalah hal-hal yang memungkinkan tindakan tidak aman terjadi, dan mereka menjawab pertanyaan, "Mengapa hal itu bisa terjadi?"

Kategorinya adalah:

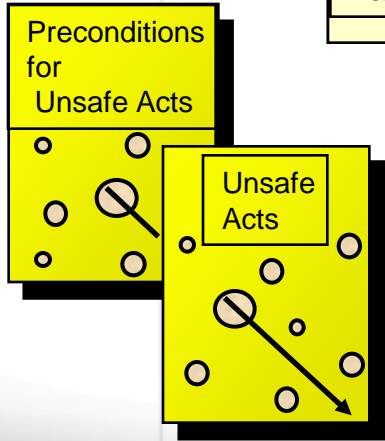
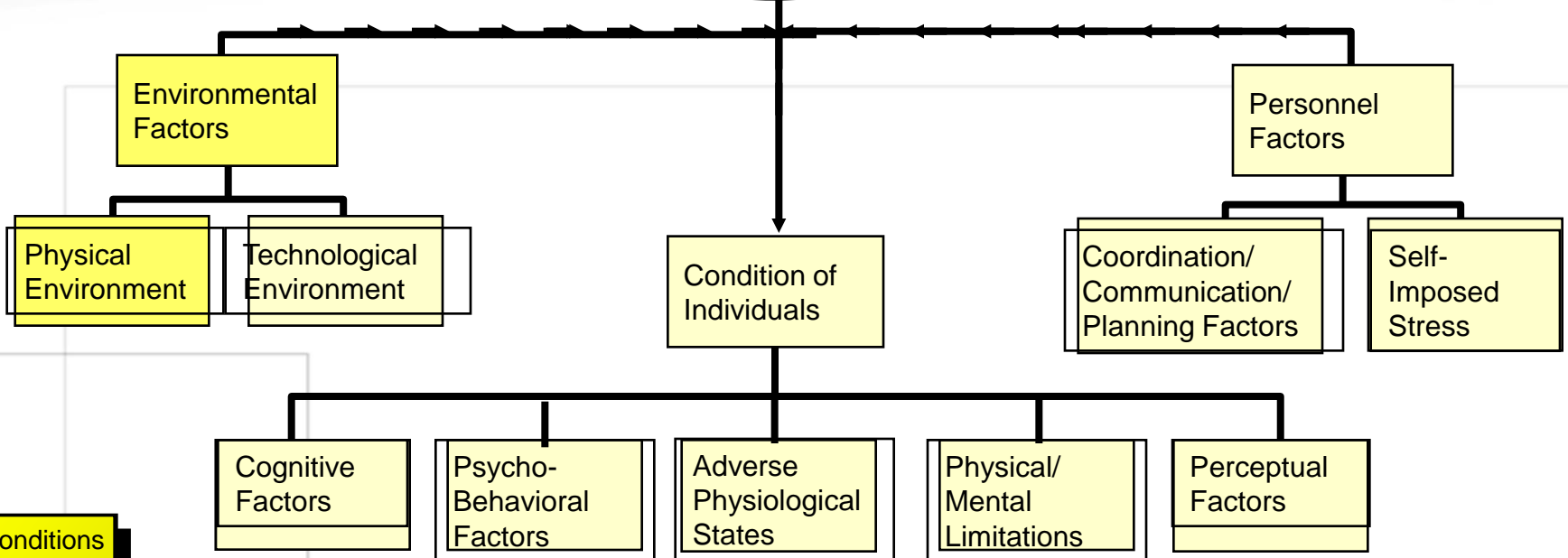


Physical environment: lingkungan kerja. Hujan, gelap, dingin, panas, dll

Technological Environment: alat yang digunakan dalam misi. Desain kendaraan dan kegunaan dari sistem yang terkait

Self-imposed stress: alkohol, kurang tidur, tingkat kebugaran

PRECONDITIONS



PRECONDITIONS

Environmental Factors

Personnel Factors

Physical Environment

Technological Environment

Condition of Individuals

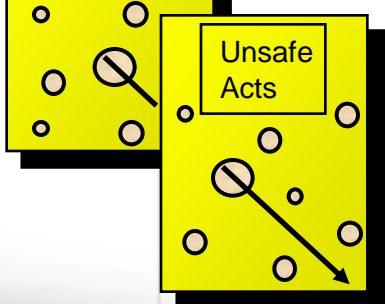
Coordination/Communication/Planning Factors

Self-Imposed Stress

Physical/

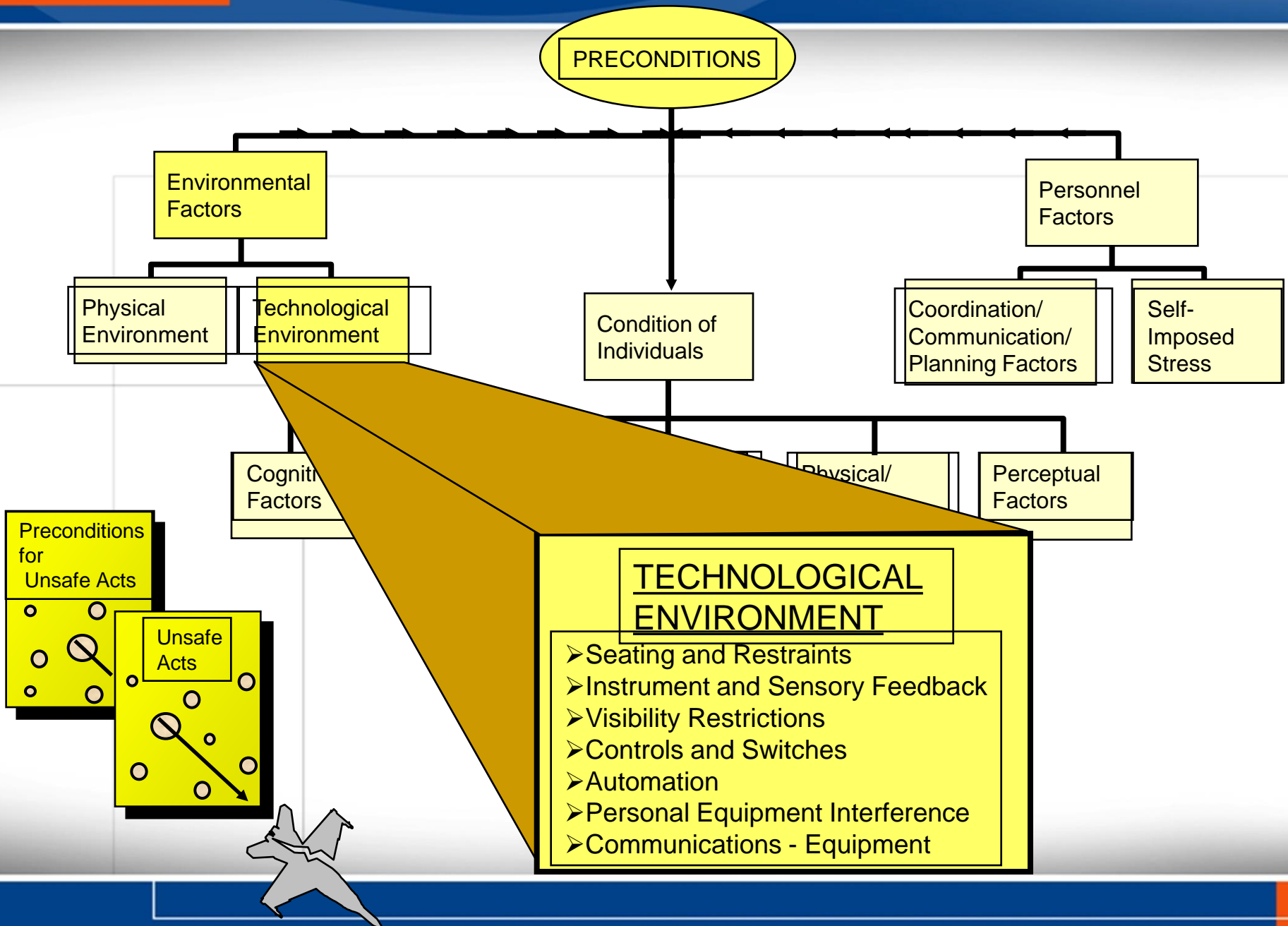
Perceptual Factors

Preconditions for Unsafe Acts



PHYSICAL ENVIRONMENT

- Icing/Fog/Etc. on windows
- Meteorological Conditions
- Dust/Smoke/Etc. in Workspace
- Brownout/Whiteout
- Thermal Stress: Cold/Hot
- Maneuvering Forces In-Flight
- Noise Interference



PRECONDITIONS

Environmental Factors

Personnel Factors

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Technological Environment

Condition of Individuals

Coordination/Communication/Planning Factors

Self-Imposed Stress

Cognitive Factors

Physical/

Perceptual Factors

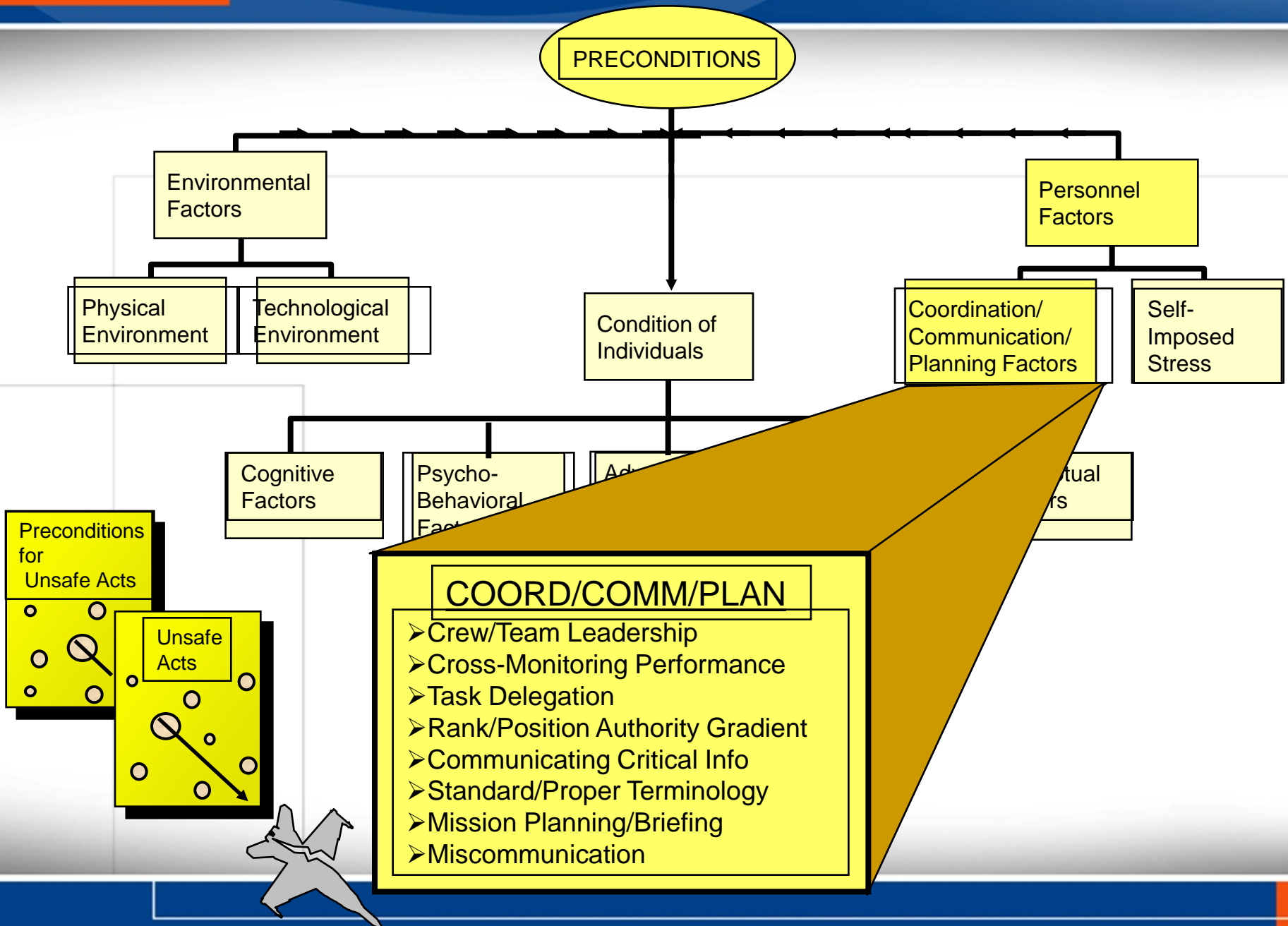
TECHNOLOGICAL ENVIRONMENT

- Seating and Restraints
- Instrument and Sensory Feedback
- Visibility Restrictions
- Controls and Switches
- Automation
- Personal Equipment Interference
- Communications - Equipment

Preconditions for Unsafe Acts

Unsafe Acts





PRECONDITIONS

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Coordination/
Communication/
Planning Factors

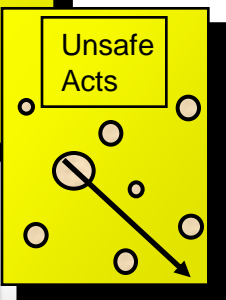
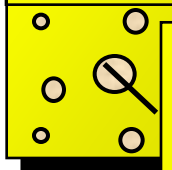
Self-Imposed Stress

Cognitive Factors

Psycho-Behavioral Factors

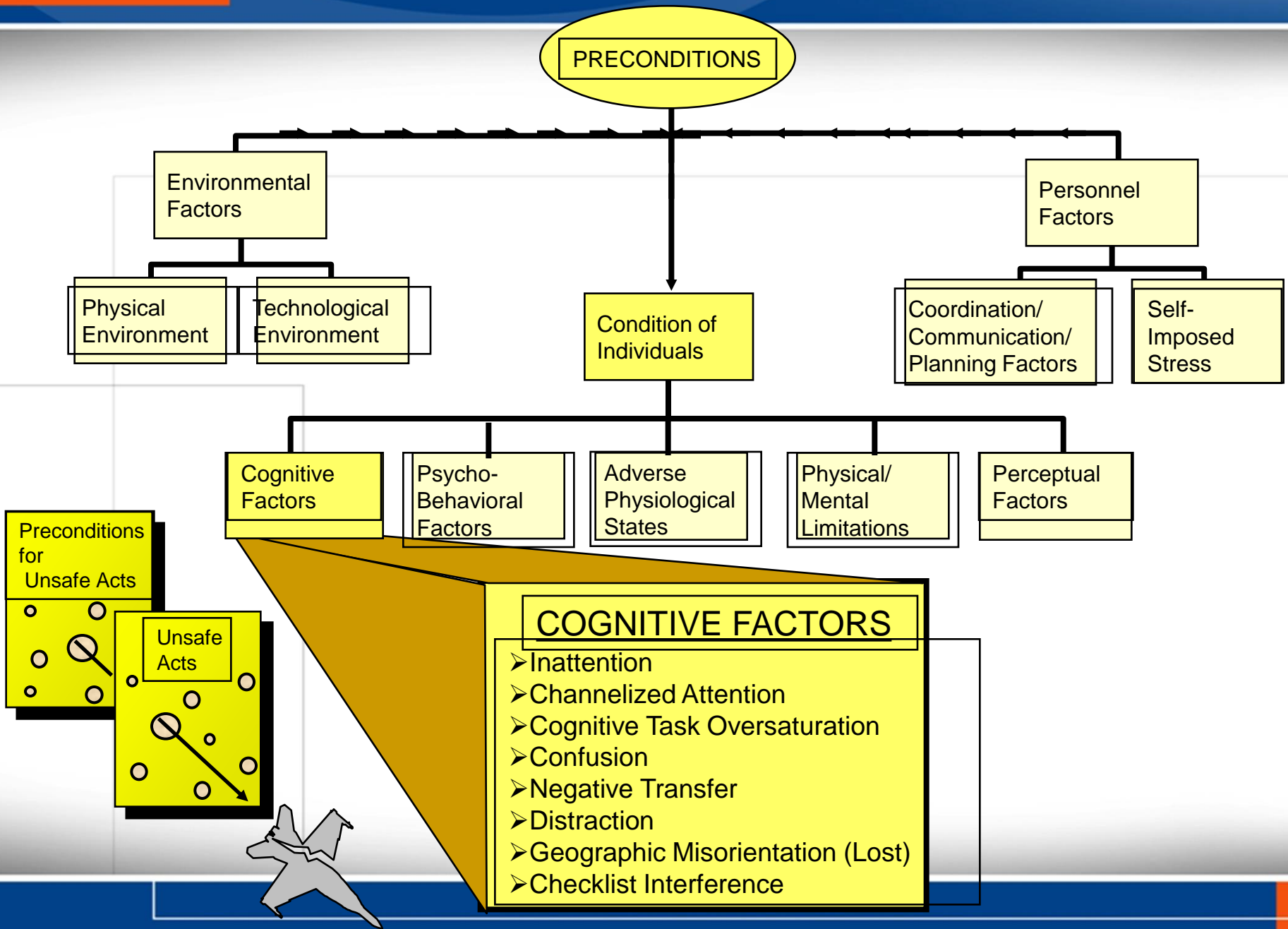
Adverse Physiological

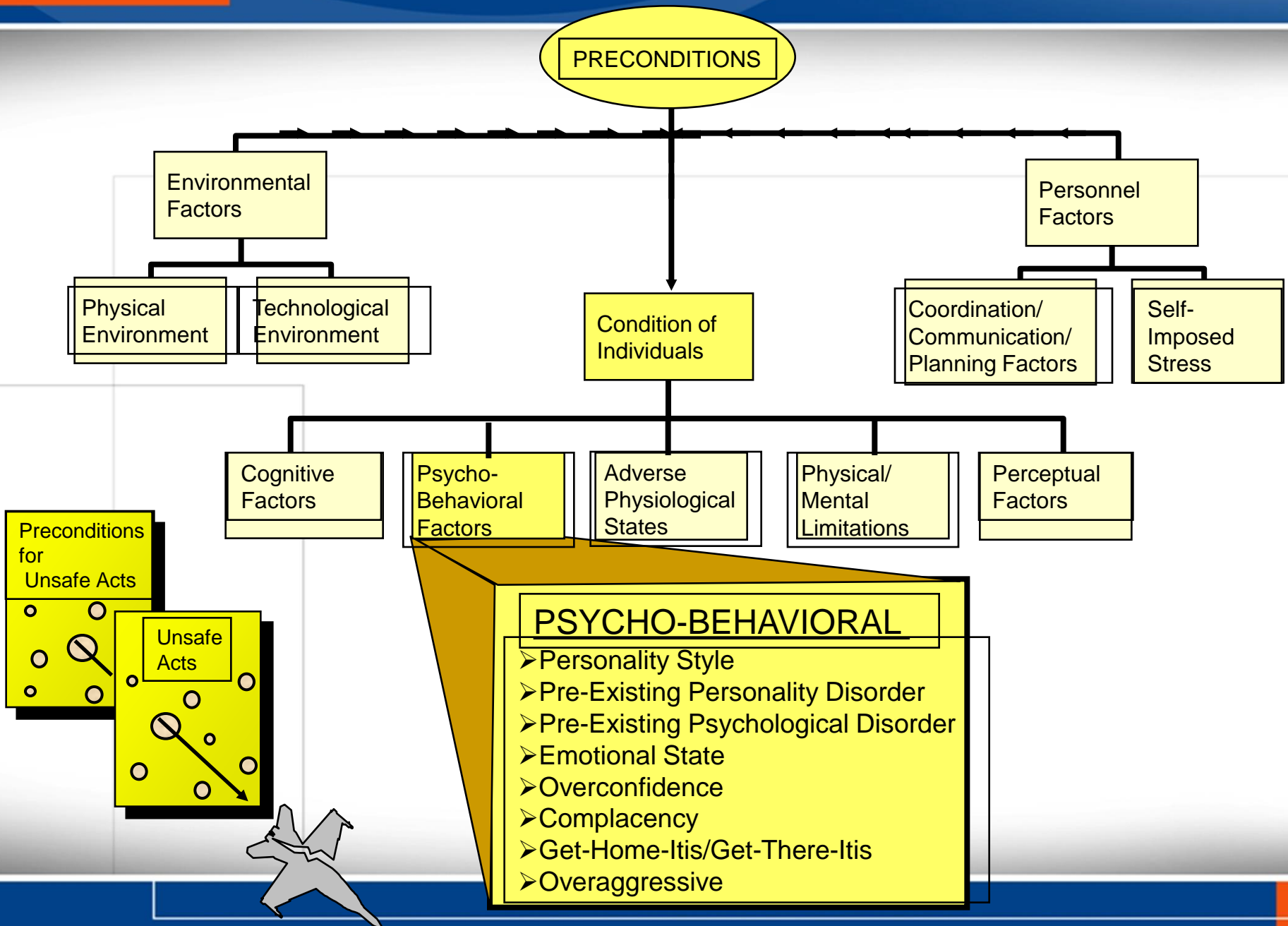
Preconditions for Unsafe Acts



SELF-IMPOSED STRESS

- Alcohol
- Physical Fitness
- Drugs/Supplements/Self Medication
- Nutrition
- Inadequate Rest
- Unreported Disqualifying Medical Condition





PRECONDITIONS

Environmental Factors

Physical Environment

Technological Environment

Personnel Factors

Coordination/
Communication/
Planning Factors

Self-Imposed Stress

Condition of Individuals

Cognitive Factors

Psycho-Behavioral Factors

Adverse Physiological States

Physical/
Mental
Limitations

Perceptual Factors

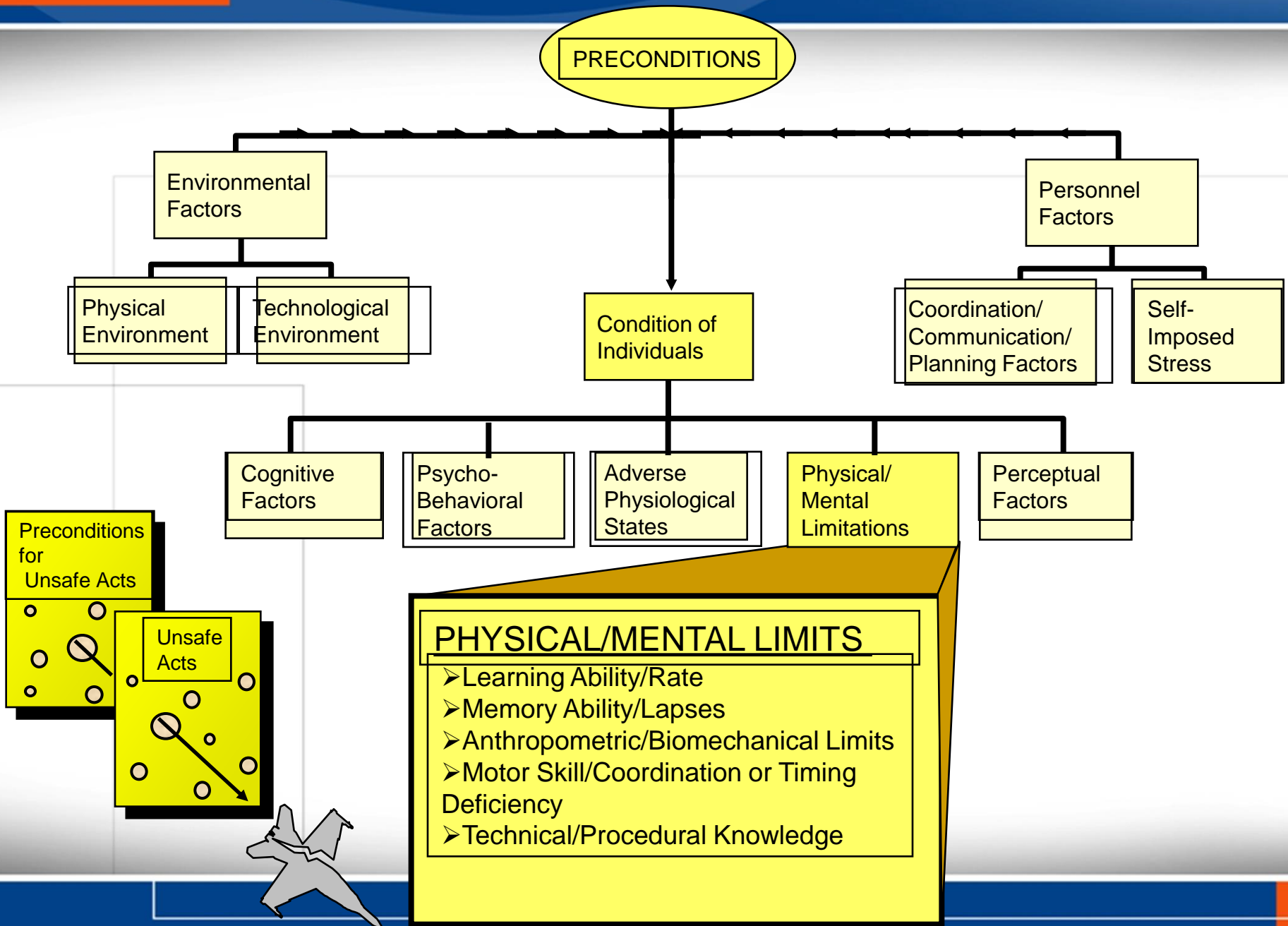
Preconditions for Unsafe Acts

Unsafe Acts

ADVERSE PHYSIOLOGICAL

- Effects of G Forces (G-LOC, etc)
- Physical Fatigue (Overexertion)
- Fatigue – Physiological/Mental
- Hypoxia
- Motion Sickness
- Circadian Rhythm Desynchrony
- Pre-Existing Physical Illness/Injury
- Prescribed Meds for Injury/Illness





PRECONDITIONS

Environmental Factors

Personnel Factors

Physical Environment

Technological Environment

Condition of Individuals

Coordination/
Communication/
Planning Factors

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Adverse Physiological States

Physical/
Mental
Limitations

Perceptual Factors

Preconditions for Unsafe Acts

Unsafe Acts

PERCEPTUAL FACTORS

- Illusions: Kinesthetic/Vestibular/Visual
- Misperception of Operational Conditions
- Misinterpreted/Misread Instrument
- Expectancy
- Auditory Cues
- Spatial Disorientation: 1, 2, & 3
- Temporal Distortion



Supervision



Inadequate supervision: kurangnya bimbingan, kebijakan tertulis, atau kesempatan pelatihan

Failure to correct known problem: masalah dengan tim atau operasi

Inappropriate Operations: kurangnya penilaian risiko atau penempatan petugas yang tidak tepat

Violations: melakukan pekerjaan di luar SOP

SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Known Problem

Supervisory Violations

Unsafe Supervision

Preconditions for Unsafe Acts

Unsafe Acts



SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Known Problem

Supervisory Violations

Unsafe Supervision

Preconditions for Unsafe Acts

Unsafe Acts

INADEQUATE SUPERVISION

- Leadership/Supervision/Oversight Inadequate
- Supervision – Modeling
- Local Training Issues/Programs
- Supervision – Policy
- Supervision – Personality Conflict
- Supervision – Lack of Feedback



SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Known Problem

Supervisory Violations

PLANNED INAPPROPRIATE OPERATIONS

- Ordered/Led Mission Beyond Capability
- Crew/Team/Flight Makeup/Composition
- Limited Recent Experience
- Limited Total Experience
- Proficiency
- Risk Assessment – Formal
- Authorized Unnecessary Hazard

Unsafe Supervision

Preconditions for Unsafe Acts

Unsafe Acts



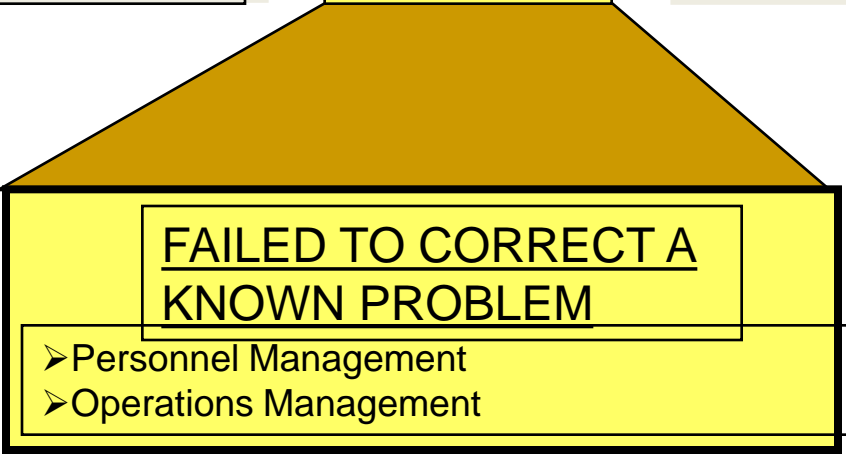
SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Known Problem

Supervisory Violations



Unsafe Supervision

Preconditions for Unsafe Acts

Unsafe Acts



SUPERVISION

Inadequate Supervision

Planned Inappropriate Operations

Failed to Correct Known Problem

Supervisory Violations

SUPERVISORY VIOLATIONS

- Supervision – Discipline Enforcement
- Supervision – Unwritten Policy
- Directed Violation
- Assigned Unqualified Individuals

Unsafe Supervision

Preconditions for Unsafe Acts

Unsafe Acts



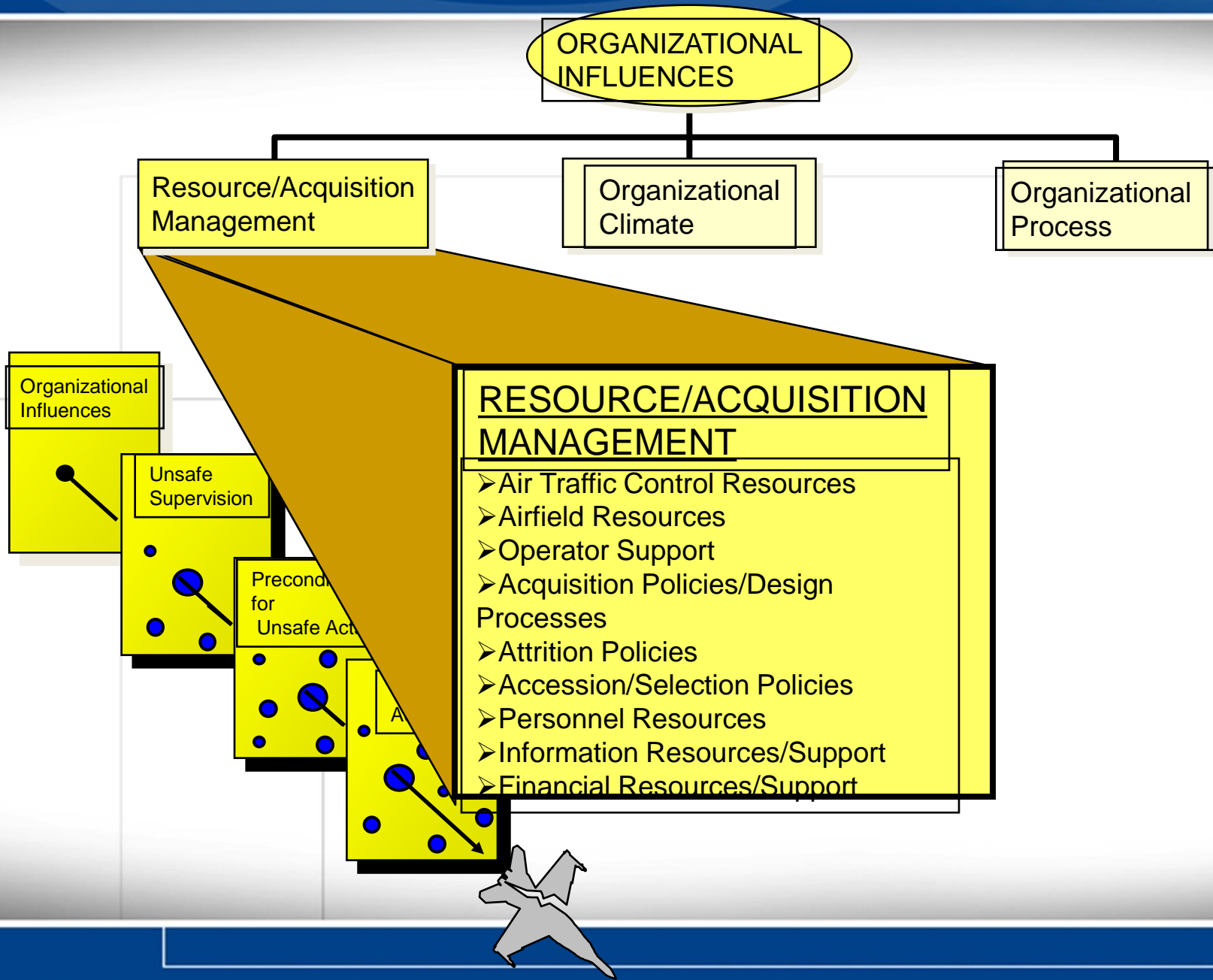
Organizational Factors

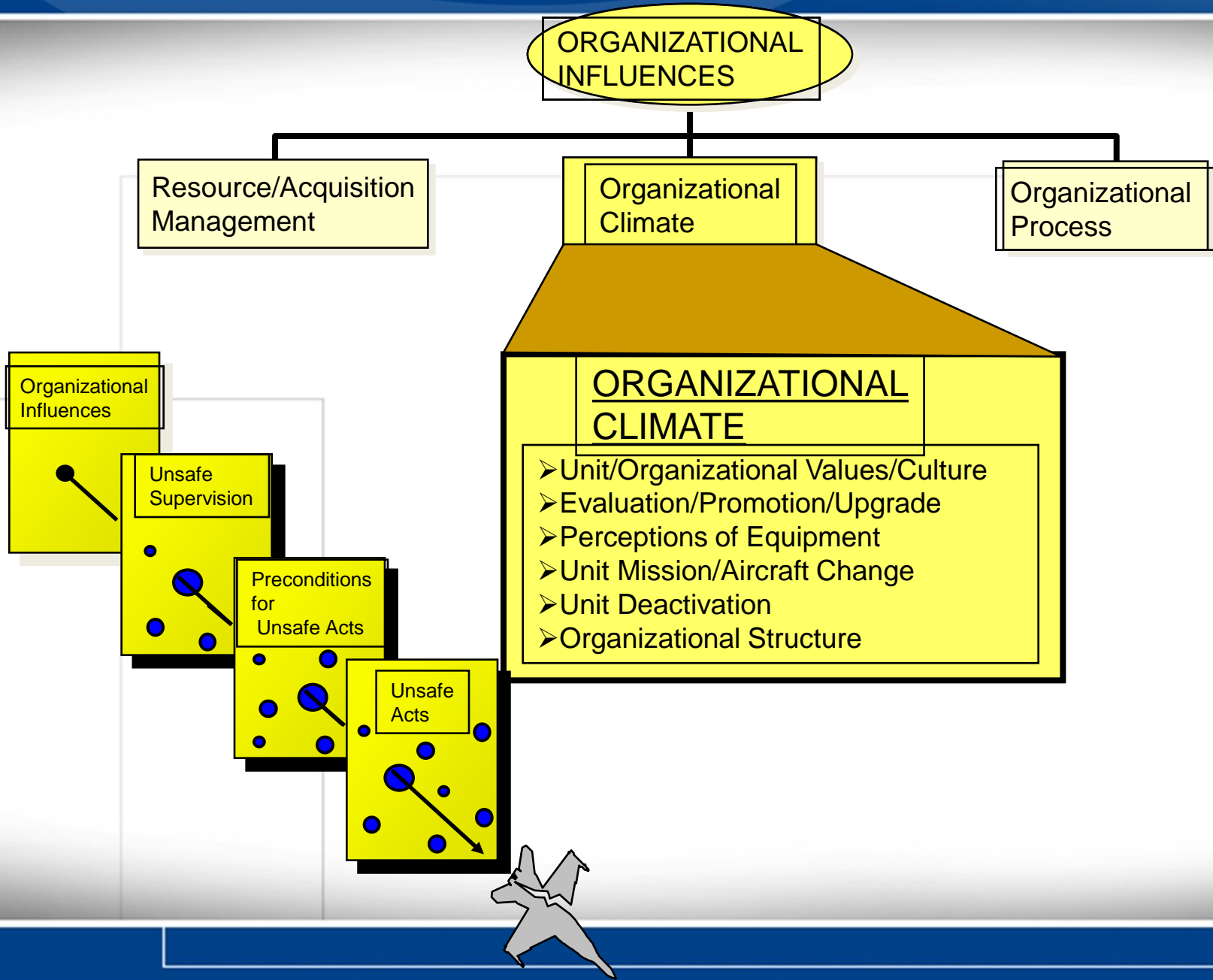
The Organization is responsible for overall policy, doctrine, and allocation of resources to the subordinate units

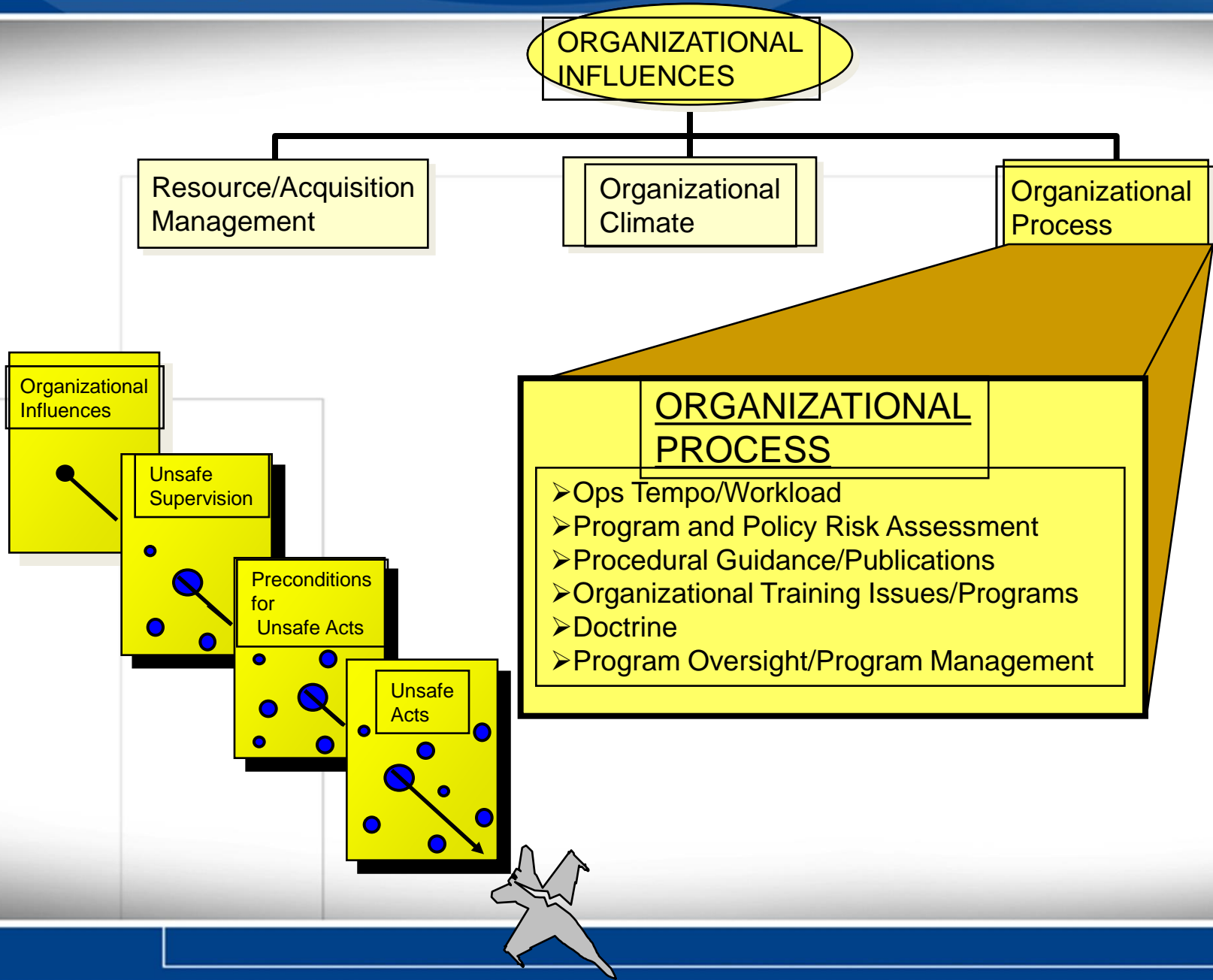
Resource/Acquisition Management: alokasi peralatan

Organizational Climate

Process: kebijakan dan prosedur yang menunjang proses operasi







REFERENSI

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- David Shinar. Traffic safety and Human Behavior. 2007. Elsevier
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- George A. Peters, Barbara J. Peters. Human Error Causes and Control. 2006. Taylor & Francis Group