Universitas **Esa Unggul**

Smart, Creative and Entrepreneurial

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HUMAN FACTOR – Teknik Pengukuran

FAKTOR MANUSIA DALAM K3
PERTEMUAN 4
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PRODI KESMAS / FIKES

TUJUAN/CAPAIAN PEMBELAJARAN

Menguraikan teknik pengukuran, jenis-jenis teknik pengukuran, instrumen dan metode pengukuran human error

Background

Tenerife Runaway Collusion, 1977

Bhopal Disaster, 1984

Challenger, 1986

Chernobyl Nuclear Disaster, 1986

King cross tube station fire, 1987

Piper Alpha Offshore, 1987

A theory of human error

(distilled from J. Reason, <u>Human Error</u>, 1990)

Preliminaries: the three stages of cognitive processing for tasks

1) Planning

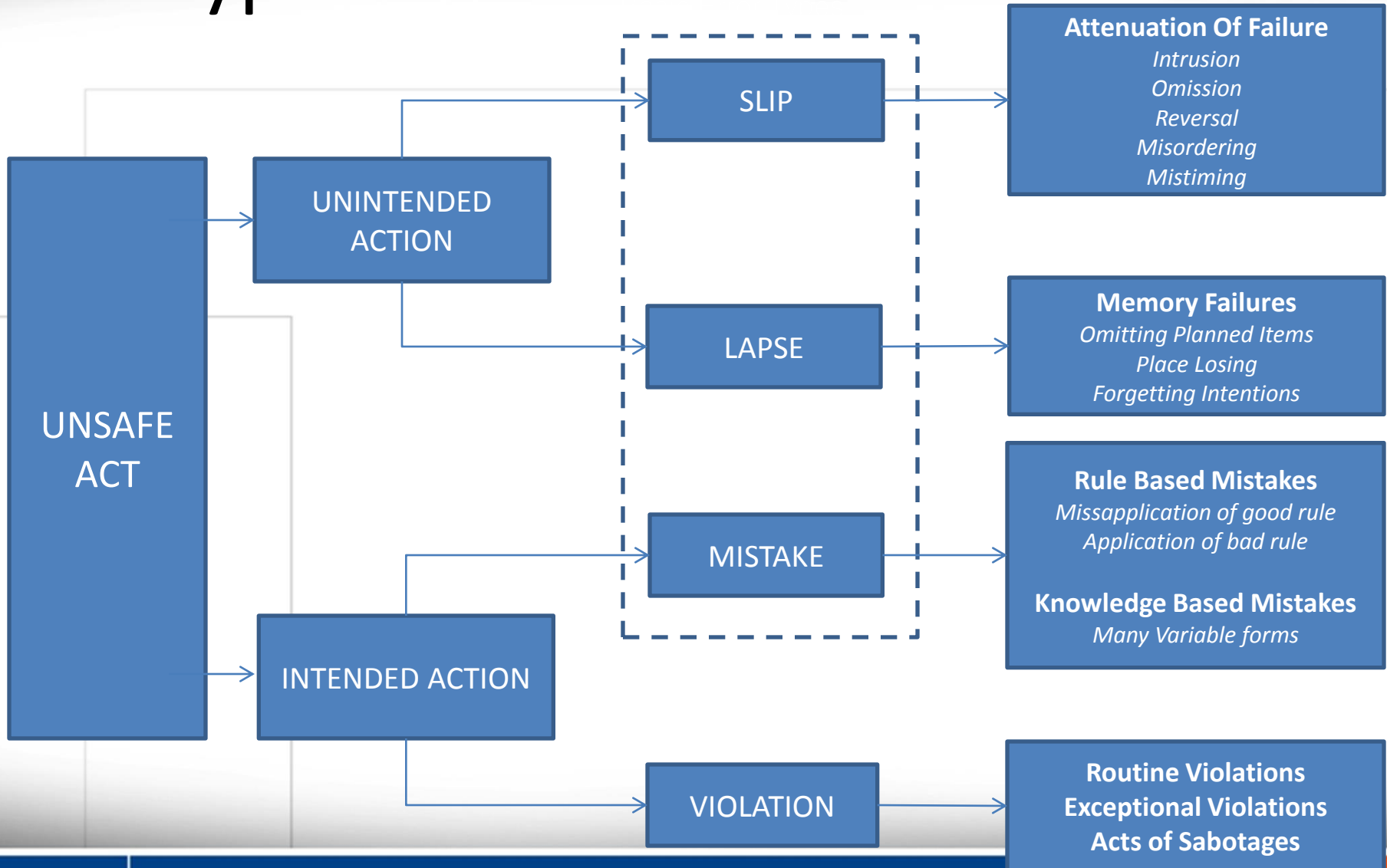a goal is identified and a sequence of actions is selected to reach the goal

2) Storage

the selected plan is stored in memory until it is appropriate to carry it out

3) Execution

the plan is implemented by the process of carrying out the actions specified by the plan

Types of Human Failure

UNSAFE ACT

UNINTENDED ACTION

INTENDED ACTION

SLIP

LAPSE

MISTAKE

VIOLATION

Attenuation Of Failure
Intrusion
Omission
Reversal
Misordering
Mistiming

Memory Failures
Omitting Planned Items
Place Losing
Forgetting Intentions

Rule Based Mistakes
Missapplication of good rule
Application of bad rule

Knowledge Based Mistakes
Many Variable forms

Routine Violations
Exceptional Violations
Acts of Sabotages

Each cognitive stage has an associated form of error

1. **Slips:** execution stage
   - incorrect execution of a planned action
   - example: miskeyed command
2. **Lapses:** storage stage
   - incorrect omission of a stored, planned action
   - examples: skipping a step on a checklist, forgetting to restore normal valve settings after maintenance
3. **Mistakes:** planning stage
   - the plan is not suitable for achieving the desired goal
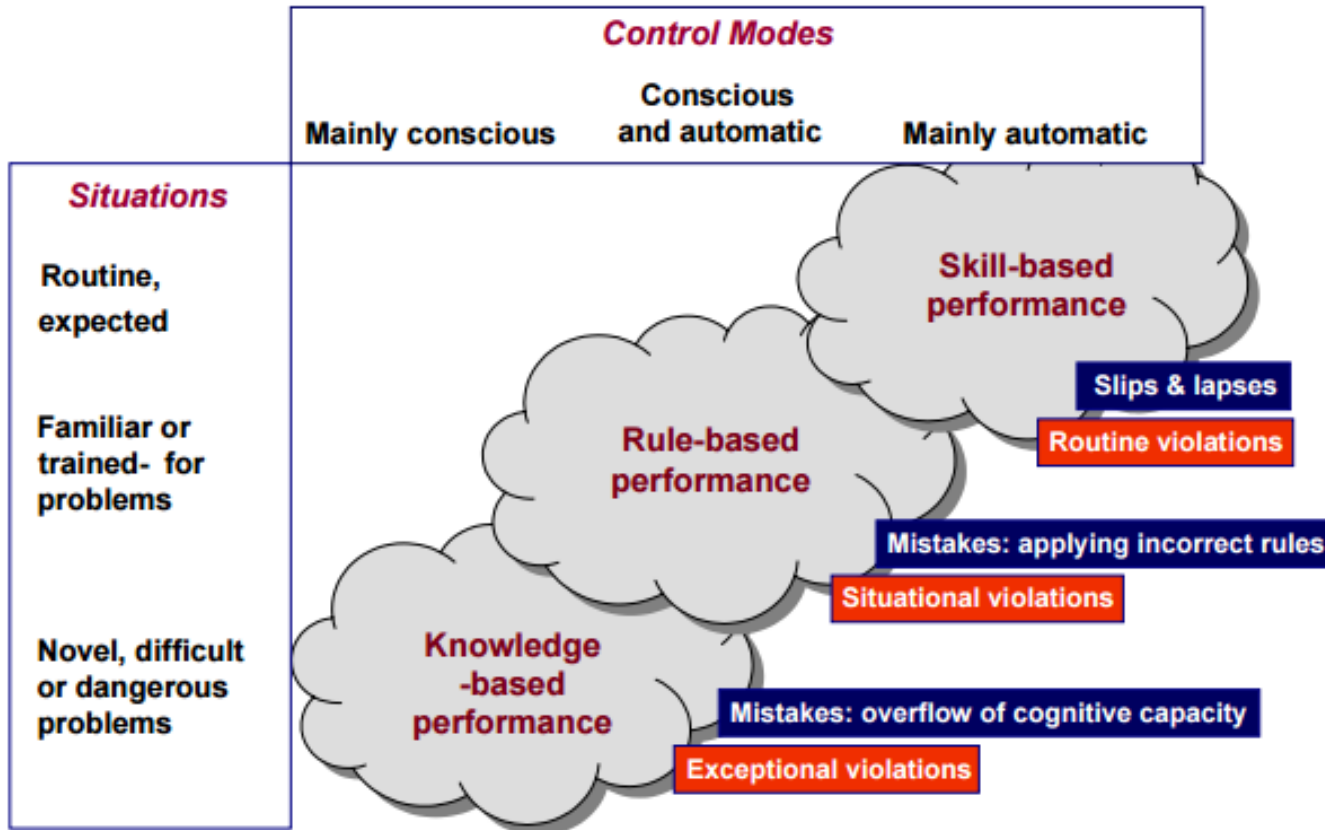   - example: TMI operators prematurely disabling HPI pumps

Performance level

Figure 2

*Performance Levels and Main Error and Violation Types
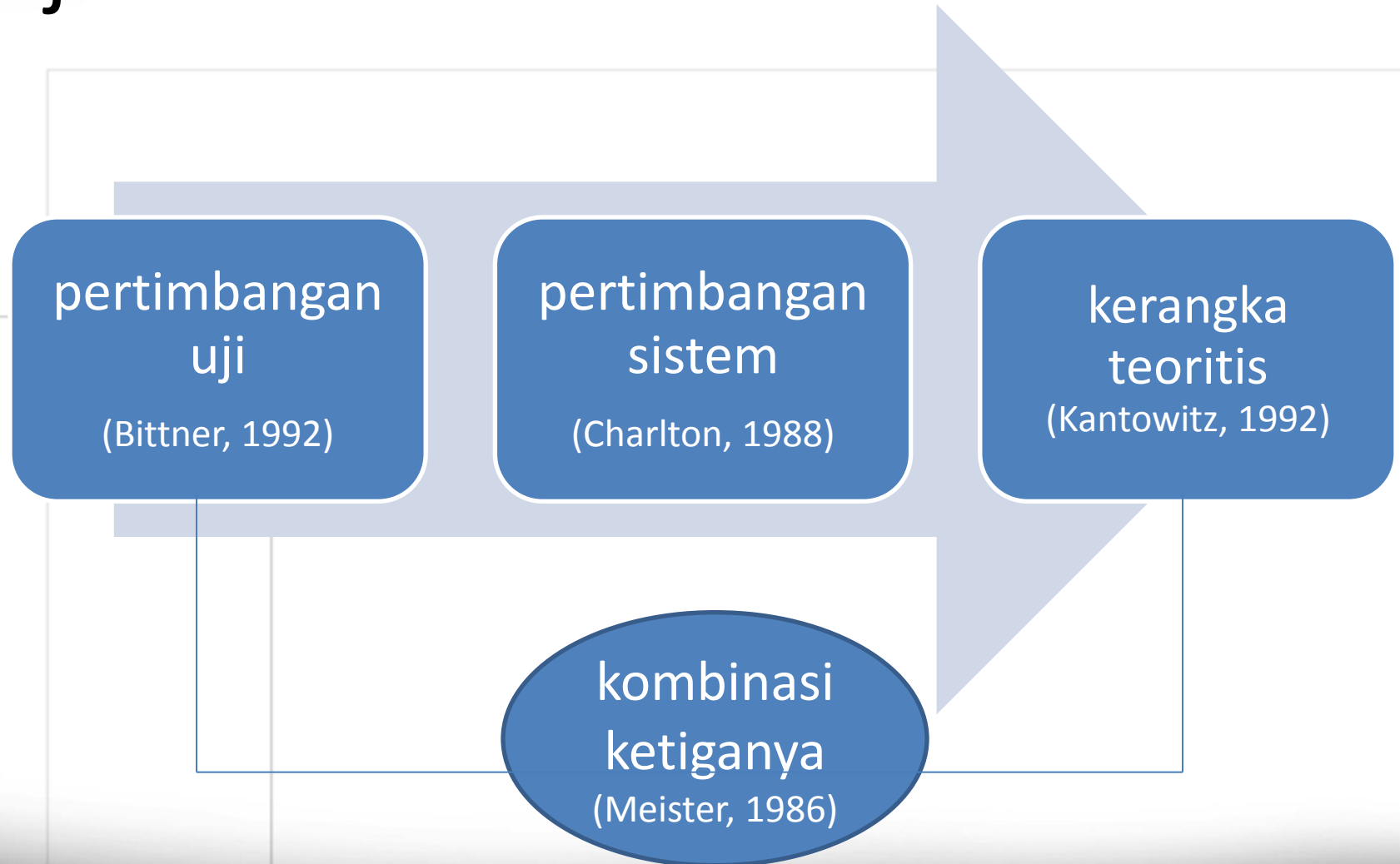(adapted from Rasmussen and Reason)*

Uji dan Evaluasi Faktor Manusia

masalah pengujian

metodologi pengukuran

paradigma analisis

Uji dan Evaluasi Faktor Manusia

pertimbangan uji

(Bittner, 1992)

pertimbangan sistem

(Charlton, 1988)

kerangka teoritis

(Kantowitz, 1992)

kombinasi ketiganya

(Meister, 1986)

The SITE Structure

Situation	**Individual**	**Task**	**Effect**
What are the relevant elements in the environment, stimuli, setting events, system functions, or goals?	Who is using the equipment of operating the system? (including their experience, skills, and momentary cognitive states)	How is the equipment being used and what behaviors are occasioned? (how hard, how fast, how much)	Success or failure? Satisfaction or disappointment?

References

- Human Error, James Reason, 1990

- The Human Contribution, James Reason, 2008

- Guideline for Preventing Human Error in Process Safety, CCPS, 1994

- Human Factor in Management of Major Accident Hazards, UK HSE