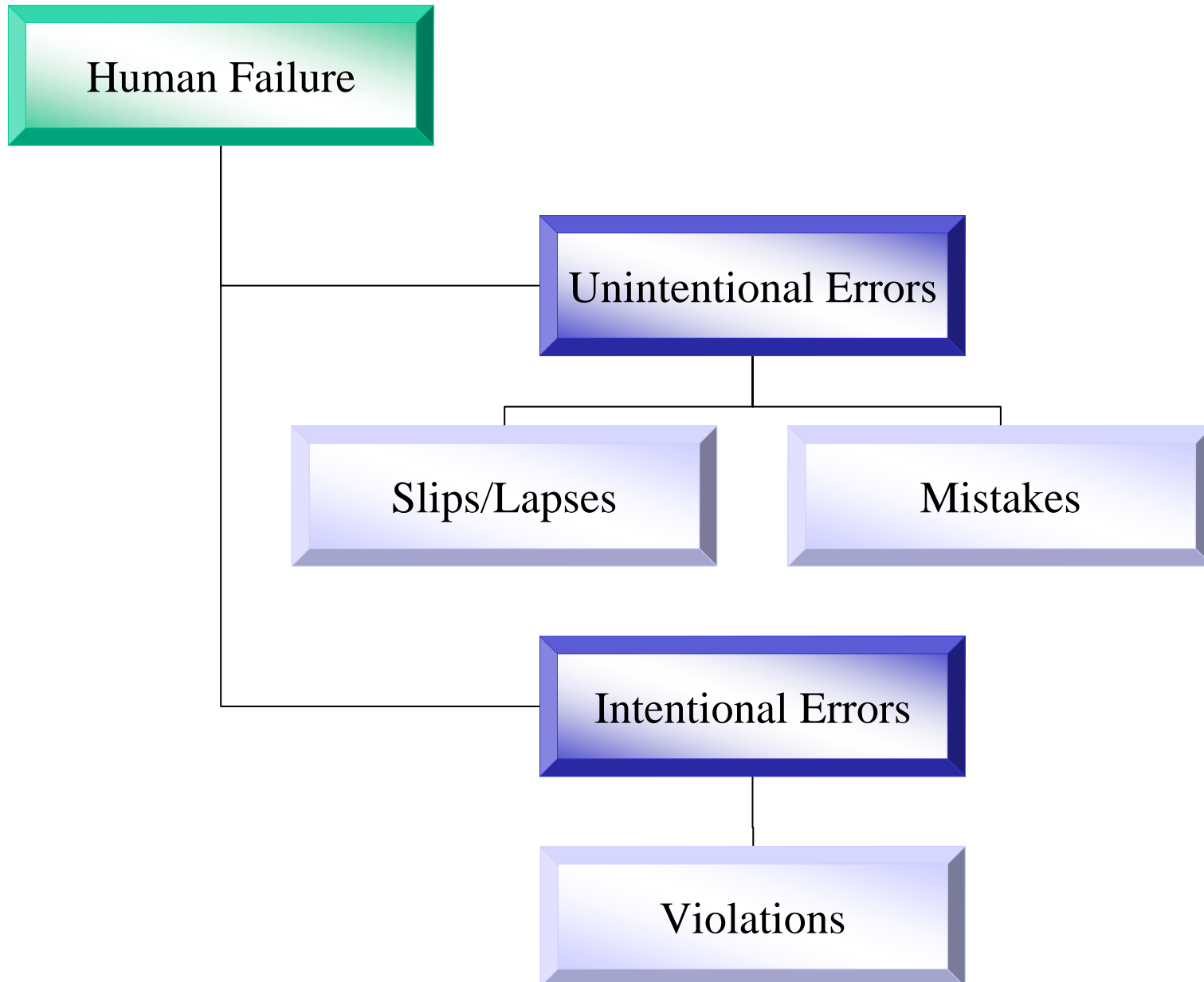
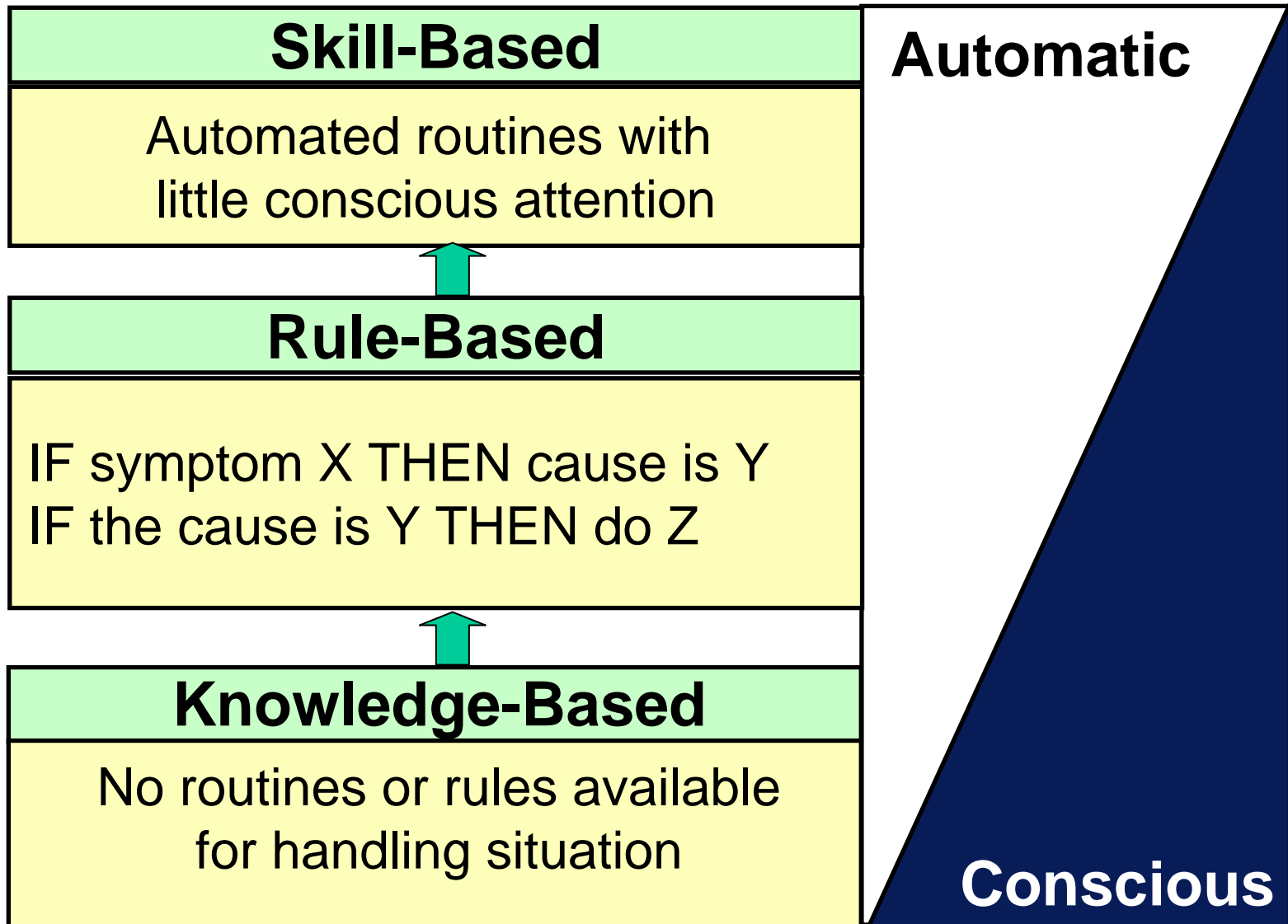

An Introduction to Human Failure

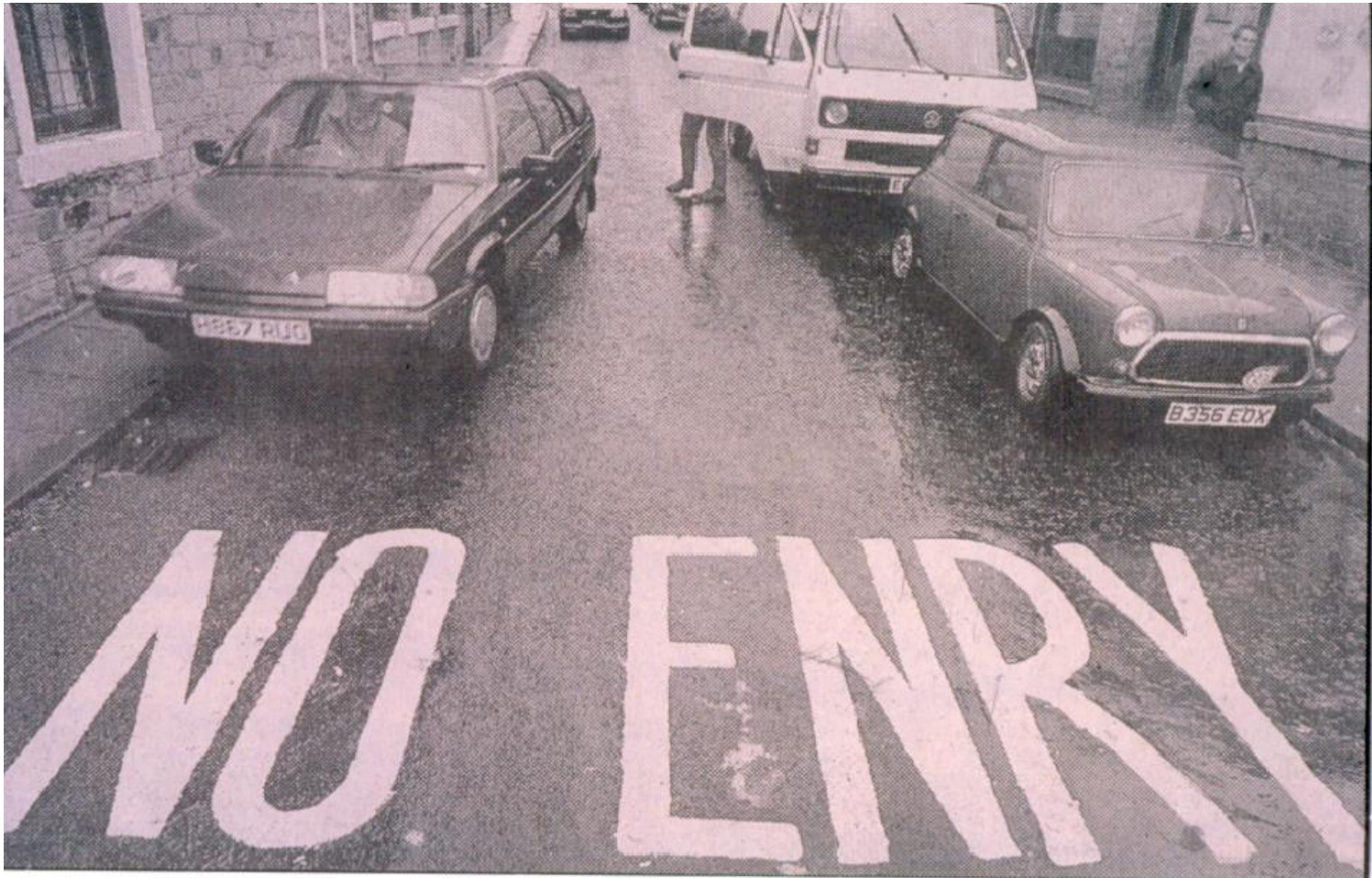
Types of Human Failure

- Human failures are not random - there are patterns or types:
 - Unintentional
 - Intentional
 - Physical (decisions)
 - Mental (decisions)
- This is important because they:
 1. Have different causes
 2. Need to be managed differently



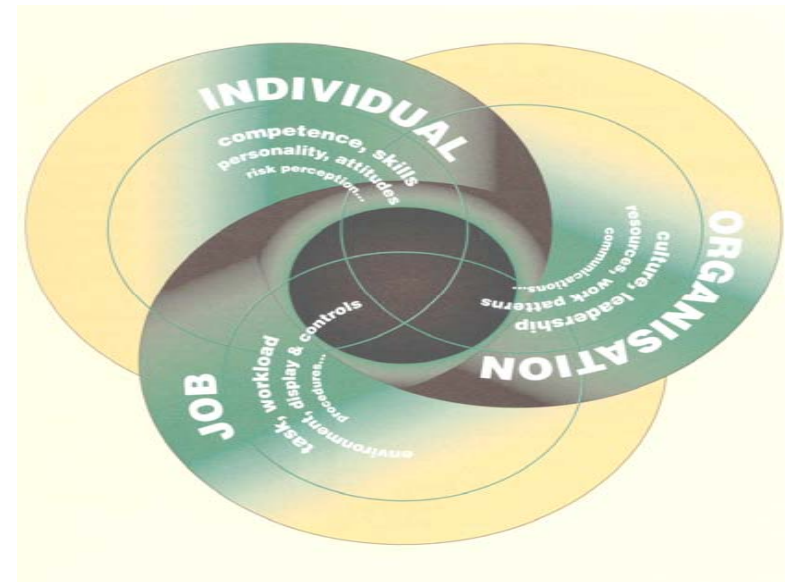
Levels of Mental Working



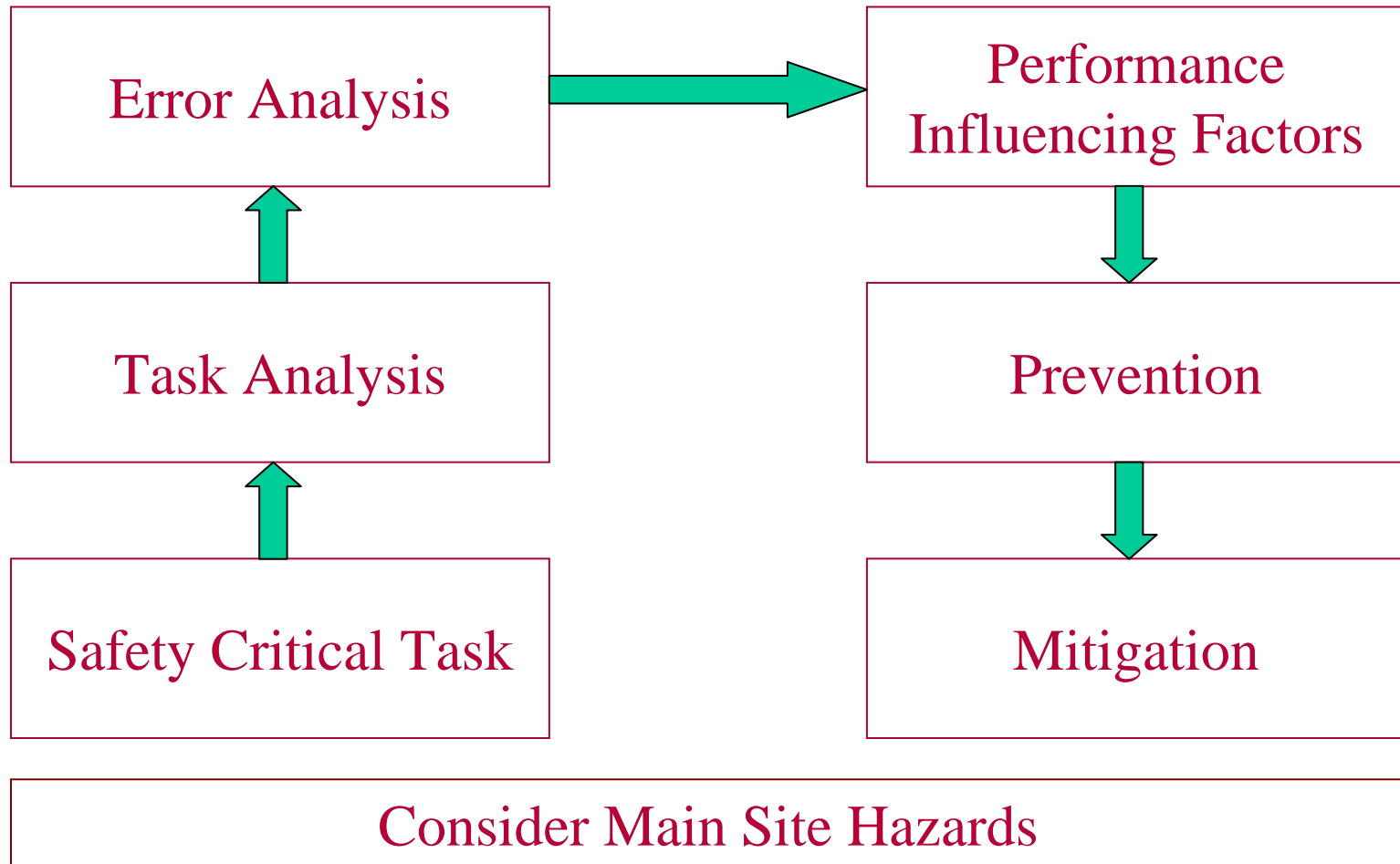


Performance Influencing Factors

- Job factors
 - Equipment design, environment, etc
- Individual factors
 - Competence, fatigue, etc
- Organisational factors
 - Work planning, culture, communication, etc



Managing Human Performance



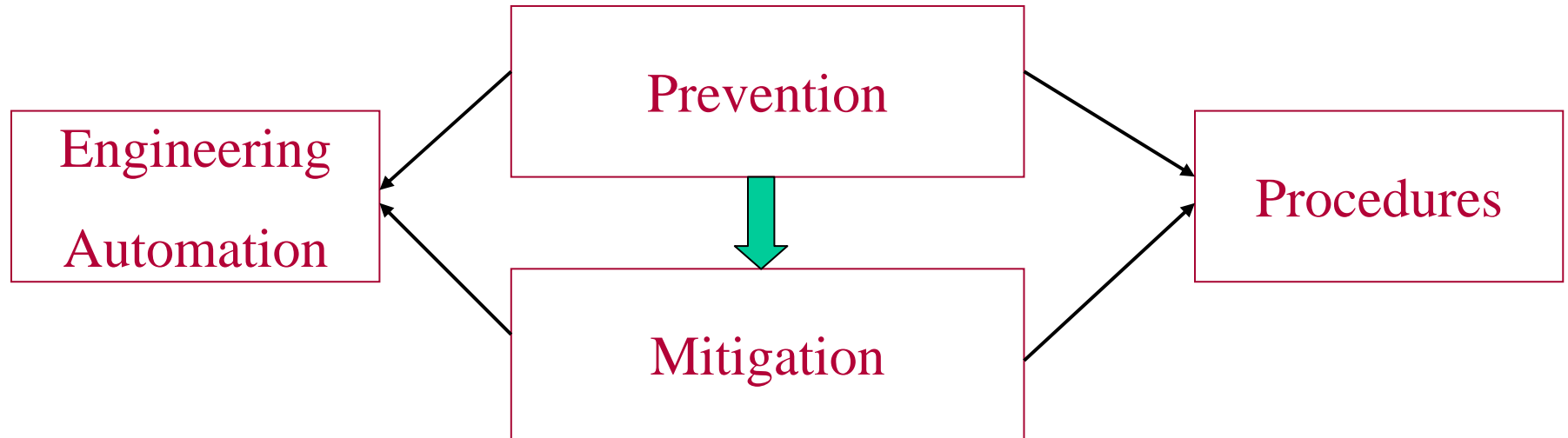
Task Analysis

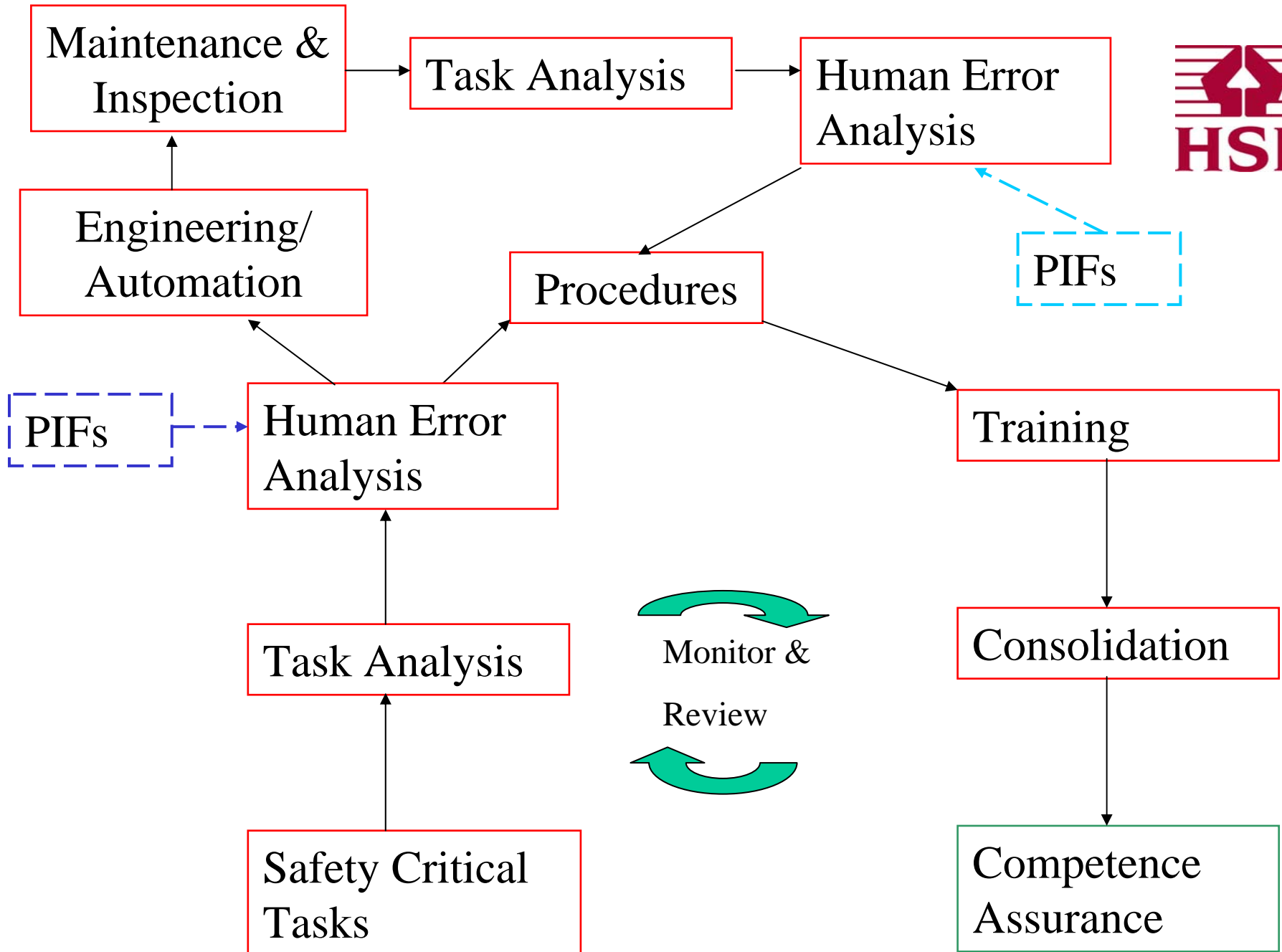
- Logical description of how to complete task.
 - Hierarchical Task Analysis (HTA)
 - Flow Charts
 - Lists
- Based on walk through.
- Consensus views sought.
- Multi-skilled team.

Human Error Analysis

- Human HAZOP guidewords
 - Action errors
 - Checking errors
 - Information retrieval errors
 - Etc
- Consider PIFs

Risk Controls





Summary of 7 steps

1. Consider main site hazards (e.g. LPG, chlorine)
2. Identify human activities for these (bulk transfers, maintenance, startup, reactor charging)
3. Outline key steps in these activities – remember to talk to operators!
4. Identify potential human failures for key steps – slips/lapses, mistakes and violations
5. Identify Performance Influencing Factors (PIFs) that make failure more likely – job, person, organisation
6. Use hierarchy of control – don't rely on humans as last line of defense, but automation introduces new issues
7. Manage error recovery – make it more likely that errors will be detected by others or the system

Human Failure – Brief Review

- Different types of failure – different controls
- Managing human performance
- Optimise performance influencing factors