Point Beach Excellence Through Error Prevention

Point Beach U1R28

Human Performance and Communication

Time Out

April 9, 2004

Human Performance Excellence

- Every Task

- Every Job

- Every Day

- EVENT FREE!

U1R28 Human Performance Issues

- Schedule anomalies
- Workers in energized equipment
- Mispositionings
- Worker contaminations
- Industrial safety events
- Others?

Objective

To <u>proactively</u> prevent events caused by human error

How does the Picture of Excellence apply?

ACEMAN

PICTURE OF EXCELLENCE

NMC
Committed to Nuclear Excellence

POINT BEACH SITE EXCELLENCE
Safe, Reliable, and Cost Effective

ORGANIZATIONAL   OPERATIONAL   TRAINING   EQUIPMENT

| Pride
Accountable
Teamwork
Learning | Safety
Config. Control
Reduce Errors | Partnership
Ownership
Participation
Effective | Zero Tolerance
Predict/Prevent
Prioritize
Reliable |

| **A**ccident
Free | **C**ontrol
Dose | **E**vent
Free | **M**eet
Schedule | **A**ttend
Training | **N**o
Rework |

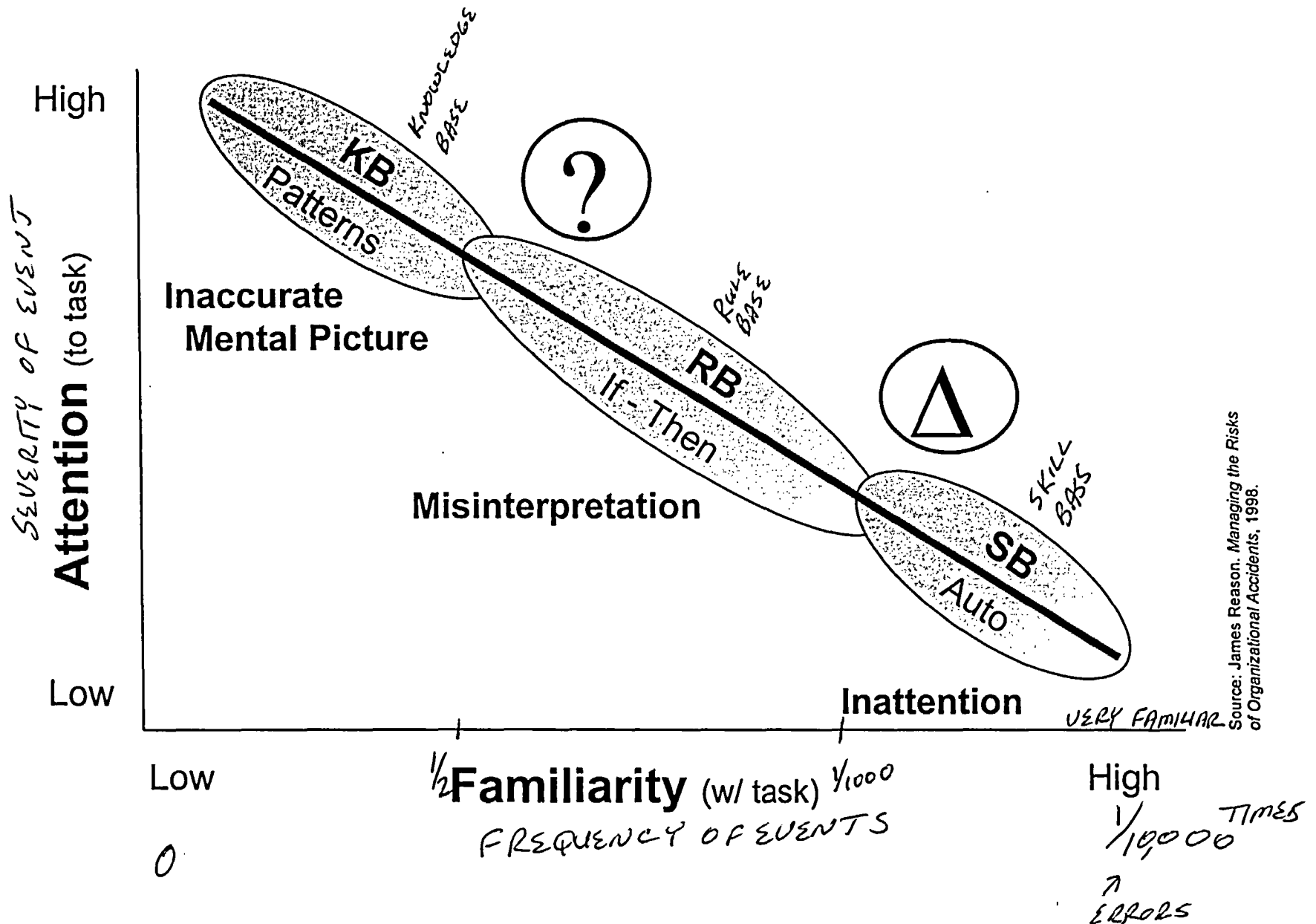| Qualified
Workers | Job
Planning
And
Preparation | Procedures
And Work
Instructions | Verification
And
Validation | Supervisor
Oversight | Worker
Practices |

BARRIERS FOR EXCELLENCE

Performance Modes

- 3 Performance Modes
  - Skill Base
  - Rule Base
  - <u>Knowledge Base</u>

Performance Modes

Source: James Reason. *Managing the Risks of Organizational Accidents*, 1998.
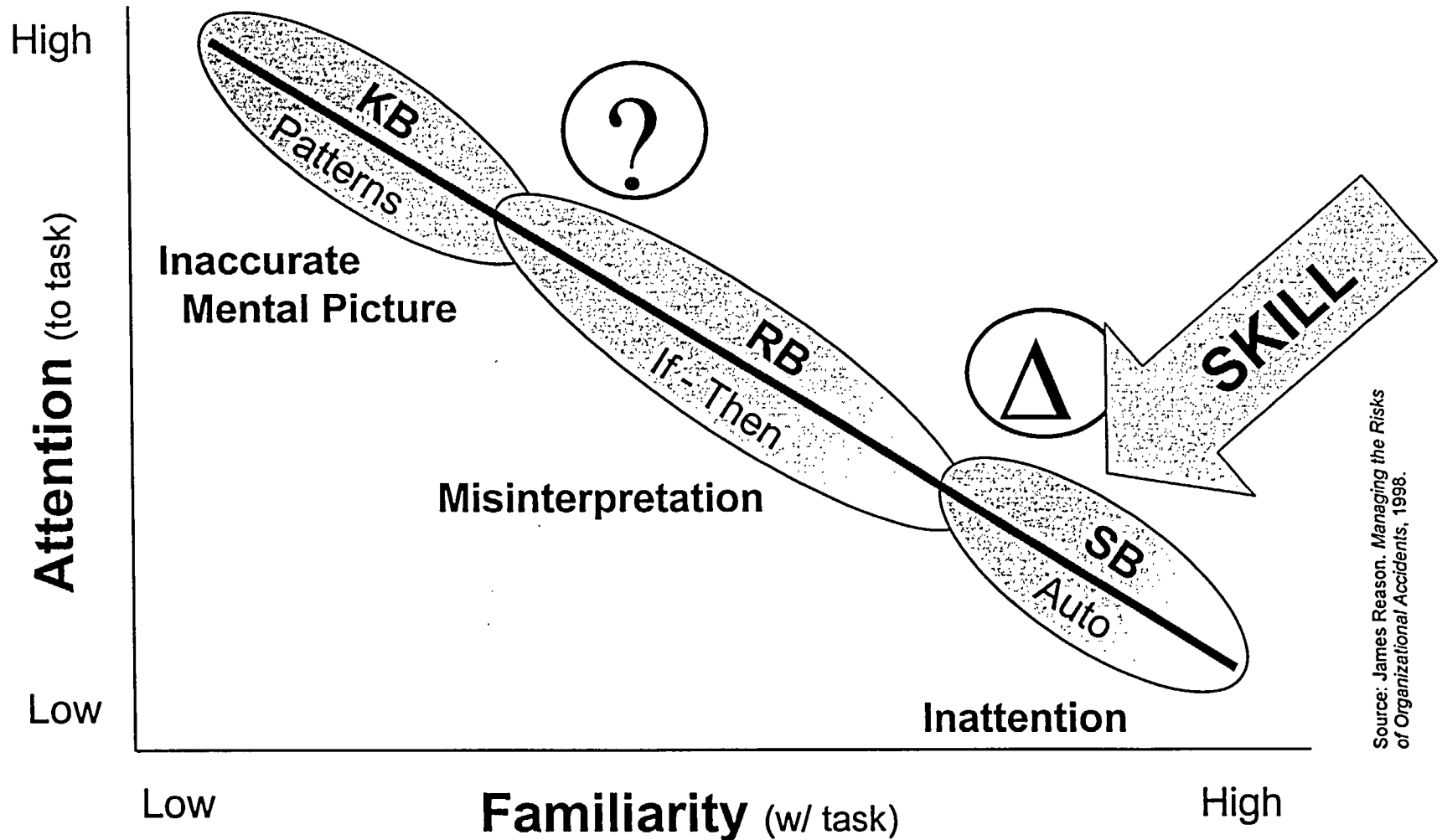
Skill Base Performance Mode

- Definition - Skill base performance involves:
  - Highly practiced actions in a very familiar situation, and
  - Usually performed from memory without significant conscious thought.
- Examples   *REPETATIVE , SIMPLE TASKS*
- Error Mode – Inattention
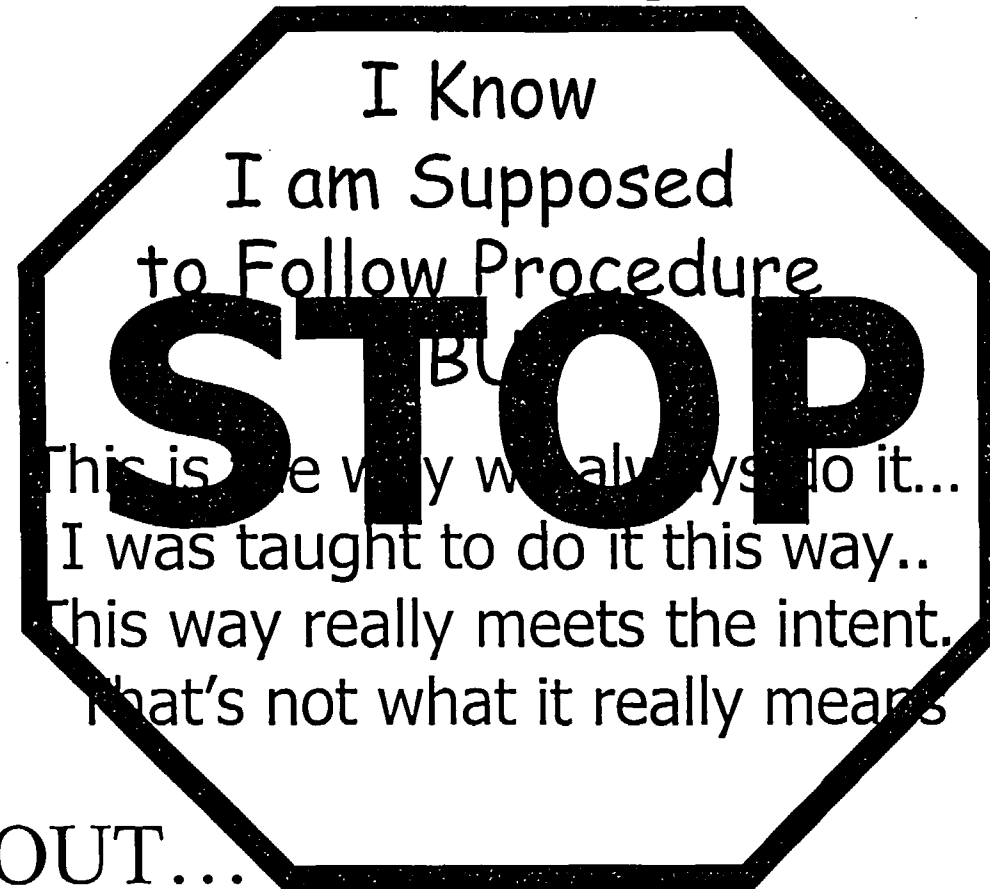
Skill Base Performance Modes

Attention (to task) — High / Low

Familiarity (w/ task) — Low / High

KB Patterns

Inaccurate Mental Picture

?

RB If - Then

Misinterpretation

Δ

SKILL

SB Auto

Inattention

Rule Base Performance Mode

- Definition – Rule base performance is
  - Is based on the selection of stored rules derived from one's recognition of a work situation;
  - it follows an IF (symptom X), THEN (situation Y) logic
- Examples *PROCEDURE COMPLIANCE*
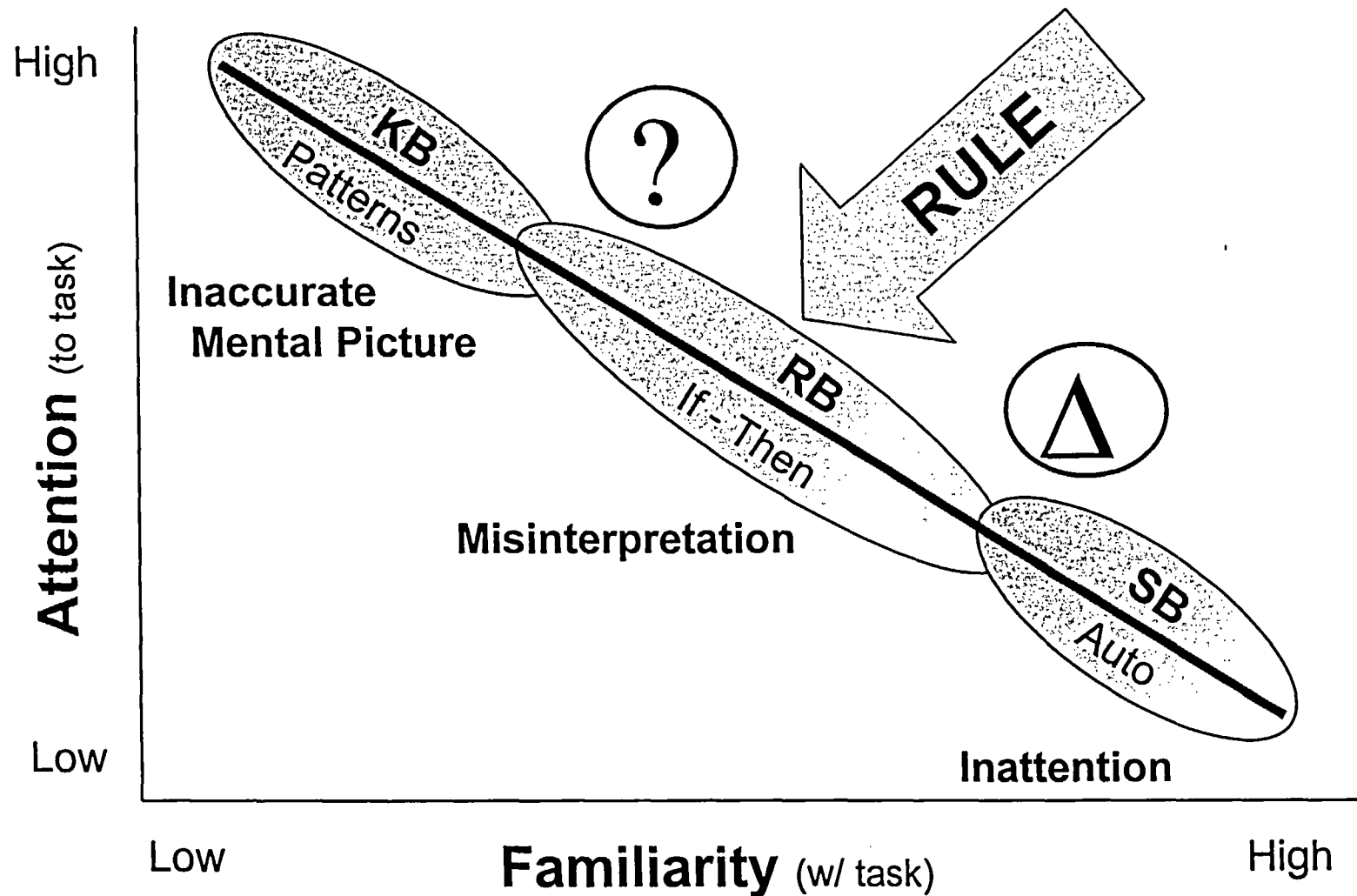- Error Mode - Misinterpretation

If You Ever
Catch Yourself Saying the
Following Phrase......

I Know
I am Supposed
to Follow Procedure

STOP

BU

This is the way we always do it...
I was taught to do it this way..
This way really meets the intent.
That's not what it really means

WATCH OUT...
You are not ...   in procedural compliance.

Rule Base Performance Modes

High

Attention (to task)

Low

KB Patterns

?

RULE

Inaccurate Mental Picture

RB If - Then

Δ

Misinterpretation

SB Auto

Inattention

Low — Familiarity (w/ task) — High
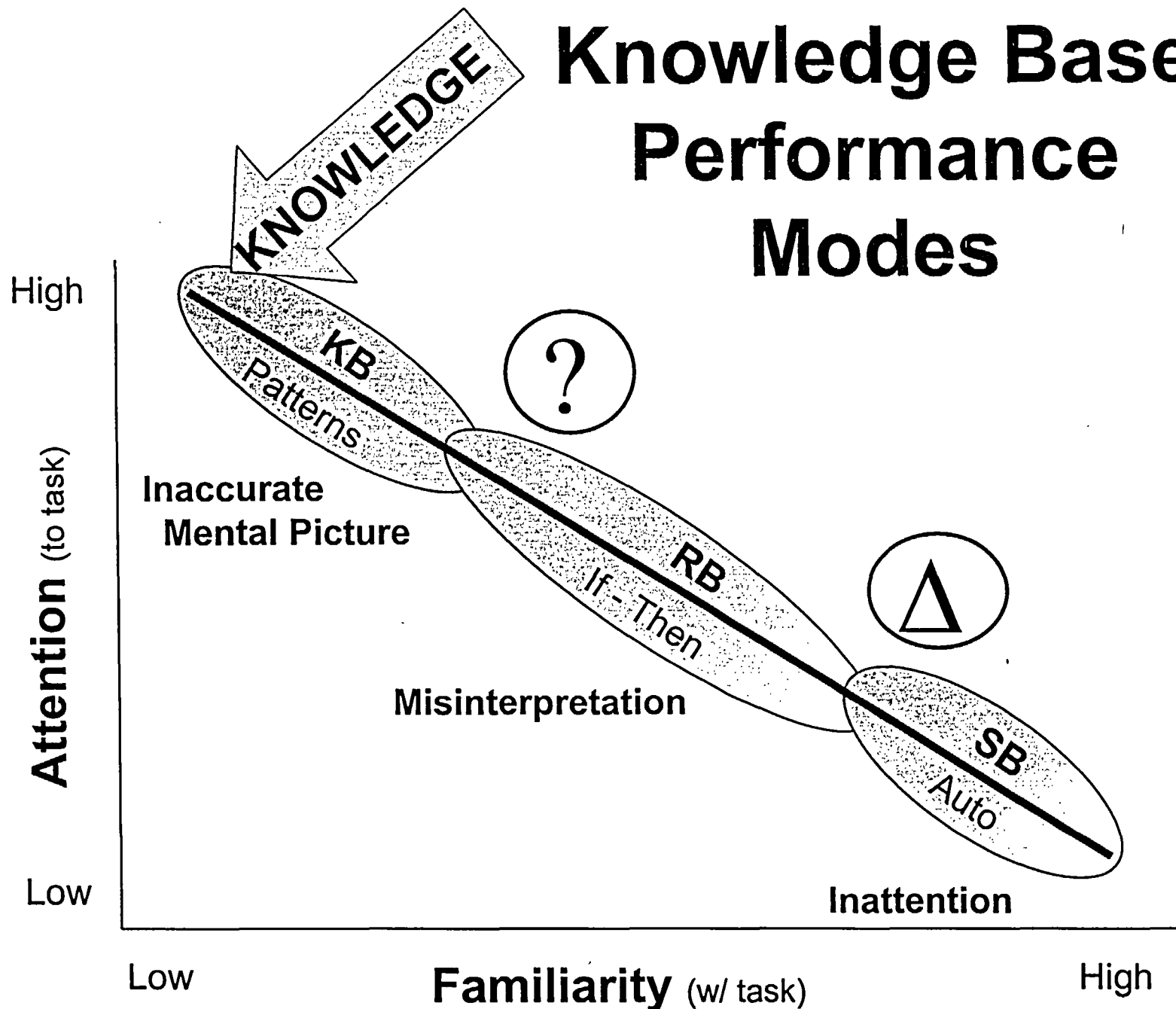
Knowledge Base Performance Mode

- Definition – Knowledge Based Performance Mode

  - Is a response to a totally unfamiliar situation

  - There exists no skill or rule recognizable to the individual.

  - People transition to knowledge based situation as soon as they realize they are uncertain.

  - High uncertainty increases the need for additional information.

- Examples *ENGINEERING PROBLEMS*

Knowledge Base Performance Mode

- Error Mode - Inaccurate Mental Model
  - Knowledge base activities require diagnosis and problem – solving
  - Error likely if based on inaccurate information
  - Most decisions are made with limited information and assumptions

Knowledge Base Performance Modes

KNOWLEDGE

High

Attention (to task)

KB
Patterns

Inaccurate
Mental Picture

?

RB
If - Then

Misinterpretation

Δ

SB
Auto

Low

Inattention

Low

Familiarity (w/ task)

High

Knowledge Base Performance Mode

- When do we perform in a Knowledge Base Performance Mode?

- How do you recognize you are in a knowledge base performance mode?

- What can you do to prevent errors when working in Knowledge Base Performance Mode?

Knowledge Base Performance Mode

- Error Reduction Tools for use in Knowledge Base Performance Mode
  - Stop when Unsure
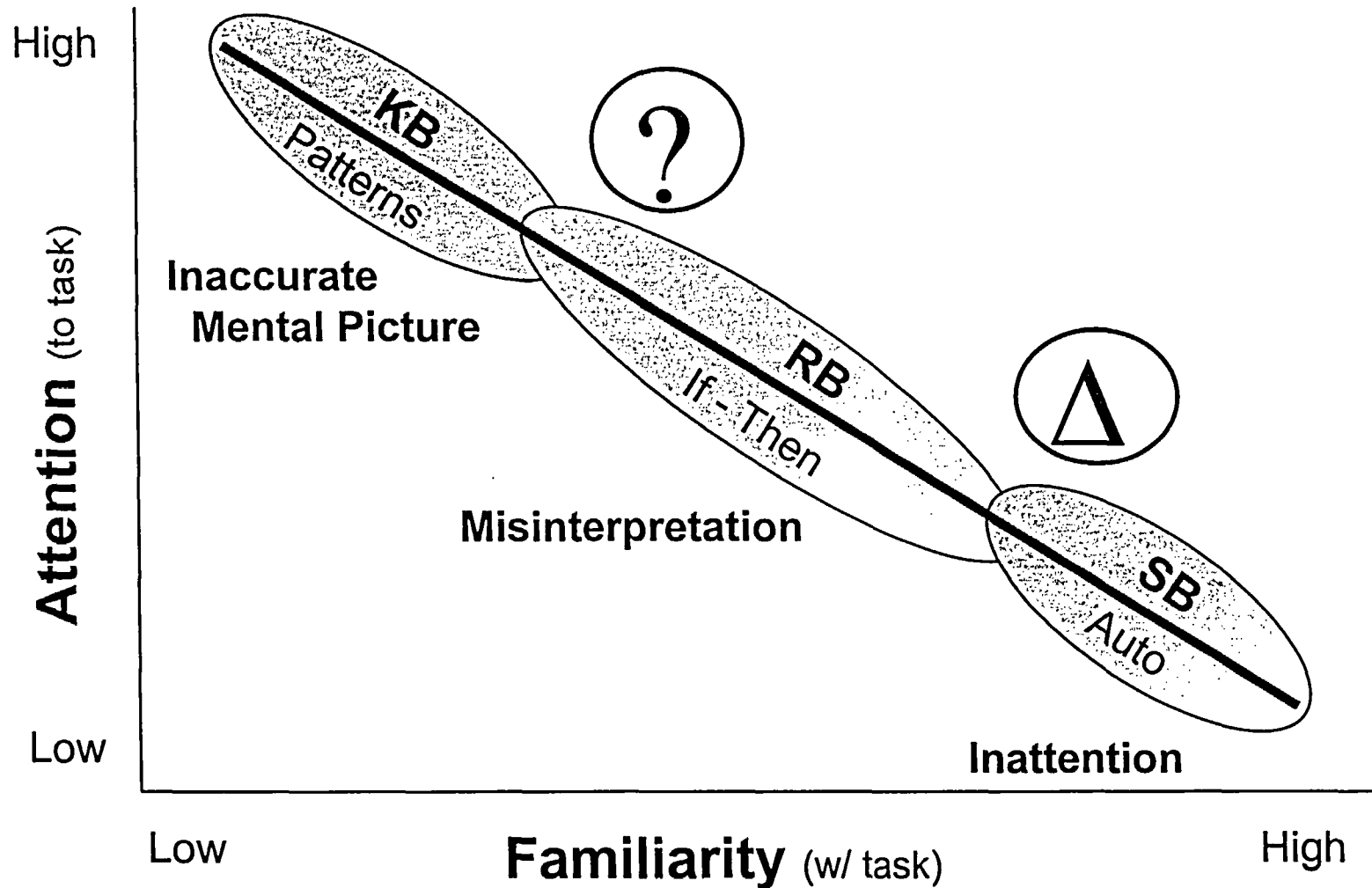 - Challenge Information (a.k.a QV&V)

NEVER WORK BY YOURSELF IN KB

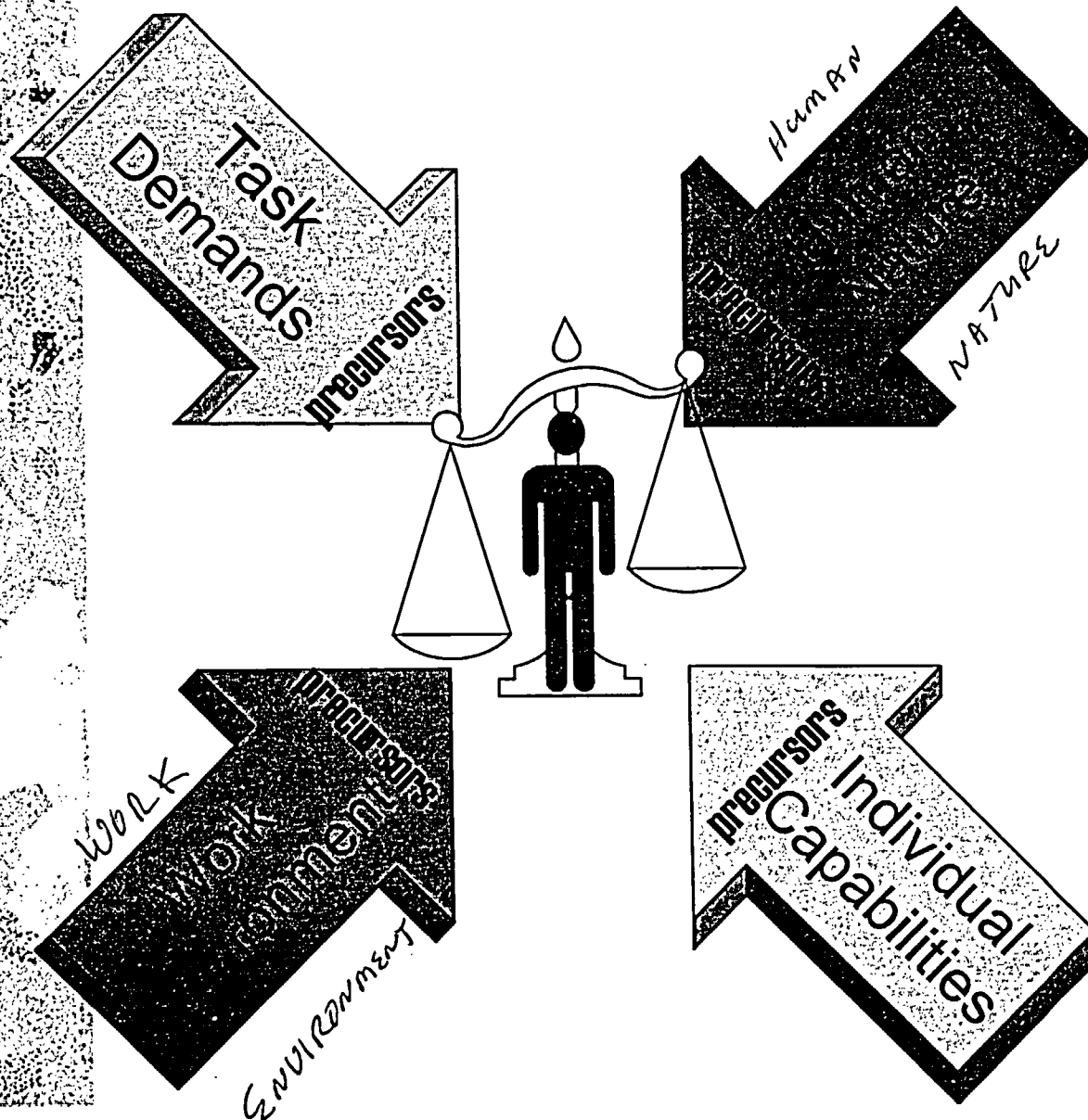# Stop When Unsure

When in doubt- STOP and resolve

Challenge Information

- The formalization of a questioning attitude and follow-up through continued challenging of information:
  - Question information
  - Check accuracy
  - External confirmation, if unsure
- Also Known as QV&V

Performance Modes

Attention (to task): High / Low

Familiarity (w/ task): Low / High

- KB Patterns
- Inaccurate Mental Picture
- ?
- RB If - Then
- Misinterpretation
- Δ
- SB Auto
- Inattention

Error-likely Situation

An error about to happen due to error precursors.

- Task Demands
- Work Environment
- Human Nature
- Individual Capabilities

Error Precursors (short list)

TASK DEMANDS   INDIVIDUAL CAPABILITIES

Task Demands	Individual Capabilities
• High workload (memory requirements)	• Unfamiliarity with task / First time
• Time pressure (in a hurry)	• Lack of knowledge (mental model)
• Simultaneous, multiple tasks	• New technique not used before
• Repetitive actions / Monotony	• Imprecise communication habits
• Irrecoverable actions	• Lack of proficiency / Inexperience
• Interpretation requirements	• Unsystematic problem-solving skills
• Unclear goals, roles, or responsibilities	• "Can do" attitude for crucial task
• Lack of or unclear standards	• Illness or Fatigue
• Distractions / Interruptions	• Stress
• Changes / Departure from routine	• Habit patterns
• Confusing procedure / Vague guidance	• Assumptions
• Confusing displays / controls	• Complacency / Overconfidence
• Work-arounds / OOS instrumentation	• Mind set (intention)
• Hidden system response	• Inaccurate risk perception
• Unexpected equipment conditions	• Mental shortcuts (biases)
• Lack of alternative indication	• Limited short-term memory

WORK ENVIRONMENT   HUMAN NATURE

Where are my zeros?

Communication is the key...

Ineffective communications often results in:

- Errors
- Poor coordination and cooperation
- Low productivity
- Undercurrents of tension
- Unclear direction

To improve communications, all employees must:

- Understand that communication is a two-way street.

- Put more emphasis on face-to-face communications.

- Ask yourself, each time you give an instruction, was the message clear.

To improve communications, all employees must:

- Understand that communication isn't over when you finish delivering the message.

- Follow up to assure the communication is essential to success.

Bottom line...

- We **MUST** communicate with each other.