



IHTAR

An Event Management Strategy

World Food Program GHAC

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IHTAR

- Current situation – well developed training for specific emergency scenarios. No training for scenarios where the nature of the event is unclear.
- No training in managing events.
- IHTAR is a protocol to fill that gap.

IHTAR



- The “Startle Effect”
- An Event Management Strategy for –
- Any event or situation where there is a lack of clarity as to the nature of the problem or how to proceed.



- An event management strategy for any event that can absorb pilot attention, narrow focus, and severely reduce Situational Awareness
- Non- linear problem solving and identification



- Why?
- If you don't know what the problem is, difficult to solve it



- Why? Need a protocol to crew to utilize the maximum resources available to the crew **AND** *avoid over-concentration on the anomalous event.*
- Why ? Because over-concentration causes loss of Situational Awareness which may result in an Undesired Aircraft State

Precedents



- Air France 447
- American Airlines 965, Cali, Colombia
- Eastern Airlines 401, Everglades, West of Miami, Florida
- United 173, Portland, Oregon

Air France 447





USC Viterbi American Airlines Flight 965

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- Not some thing completely new
- CRM
- TEM
- Pilot Monitoring
- IHTAR gives us a protocol, a context in which to employ these successfully.
- Introduces a fourth element – **Dynamic Maneuver Monitoring – DM2**



- “I wonder what that is..?”
- “Why is the aircraft doing that?”
- “Why did we lose the _____?”



- Anomalous situations present a hazard that goes beyond loss of Situational Awareness
 - Draw in and absorb the pilots –downward spiral of Situational Awareness
- Not just “heads down” but “minds scoped down.”
- Mythology – Odysseus and the Sirens, The Lorelei





- **Is it needed?**
- Recent Study of 1,020 FAA Part 121 and Part 135 accidents from 1990-2002:
 - Overall, nearly 70% were associated with some manner of aircrew or supervisory error.
- Approximately 50% associated with skill-based error, and *36.7% contained decision errors.*
 - *Human Error and Commercial Aviation Accident: A Fine Grained Analysis Using HFACS*, Shappell, Detwiler, Boquet, Weigmann, July 2006
 -



- Three step process
- Like 3 waypoints that lead to a successful solution of an anomalous event or situation



IHTAR

HITSI

WAYFI

KRES





- The Three Waypoints are:
- **IHTAR**
- **HITSI**
- **WAYFI**

The First Step



“I have the aircraft and radios; you’ve got everything else.”

HTAR



- **IHTAR**
- “I have the aircraft and radios, you have everything else.”
- Ensures 1st priority – maintain aircraft in a safe operating state
- *Aviate*
- *Navigate*



- **IHTAR**
- Also, begins an identified process
- Clearly assigns roles
- Maintains authority of Captain
- Assures command integrity of entire crew and aircraft control
- Starts a specific communication – DIALOG



- PF maintains focus on aircraft state, fly the aircraft, *AVIATE*, awareness of outside environment, communication with ATC
- Avoid the “Two Heads Down” phenomenon
- Communicate with ATC, tell them what you need and **WHY**. Make them part of the solution.
- Could be UHTAR

The Second Step



HITSI

“Here is the way I see it.”

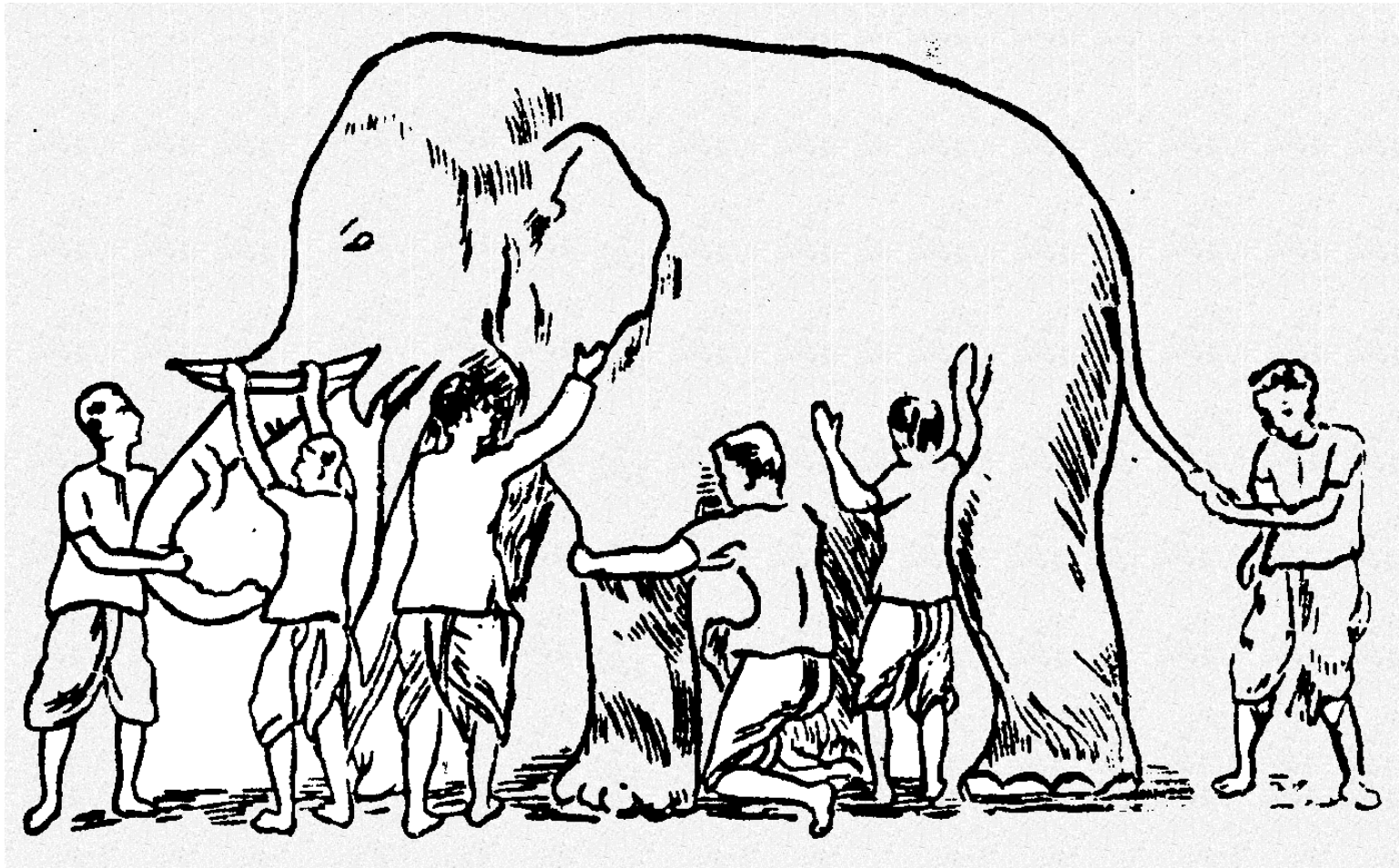
HITSI – The Second Step

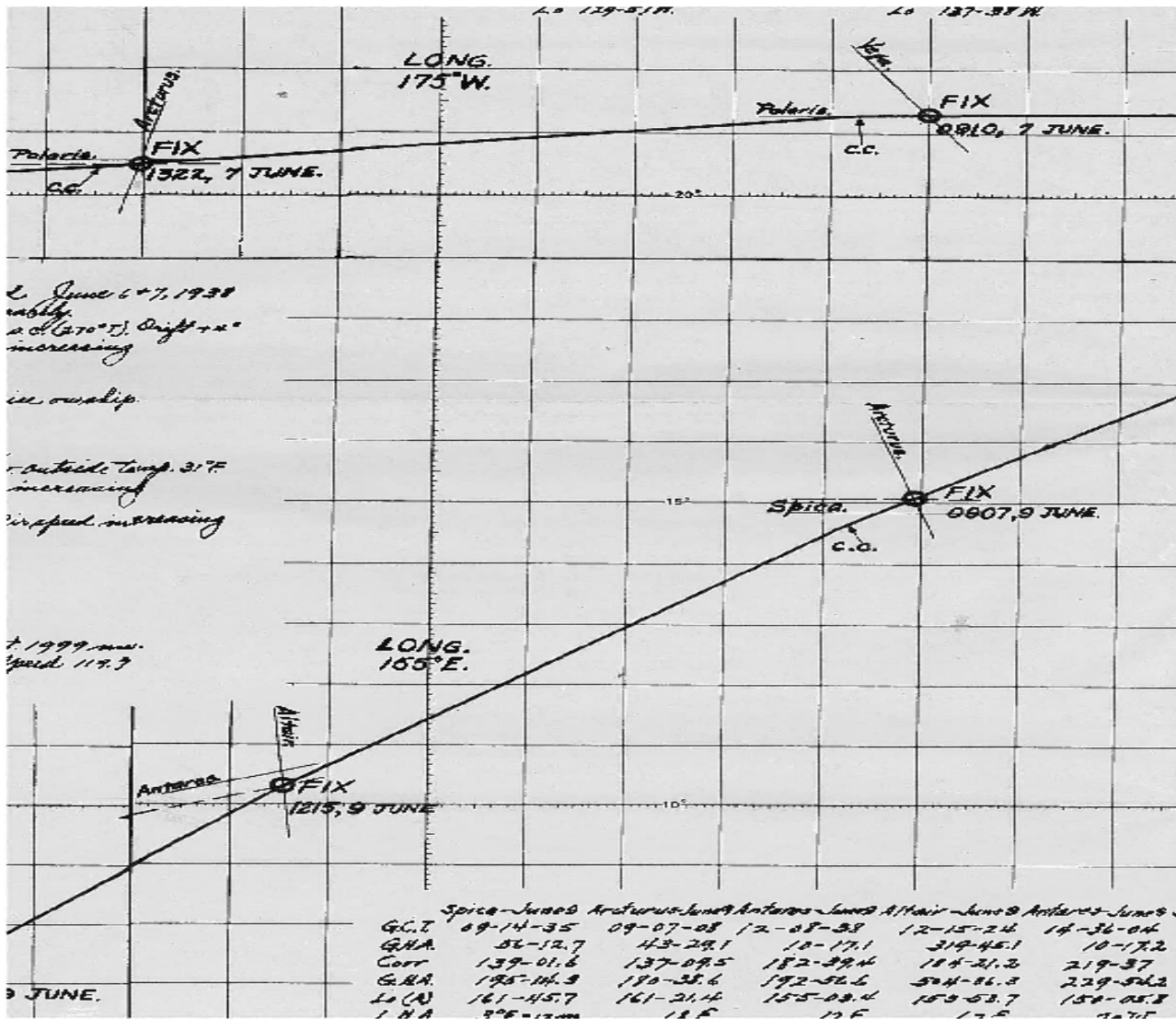


- **HITSI**
- “Here is the way I see it”
- Directly builds upon CRM
- Continues the crew communication process
- Establishes a common basis of understanding
- Seeks second view – Creates the environment for next step



- Kipling's story of the elephant and the blind men
- Sextant navigation- fix your position before setting out on a course





The Third Step



WAYFI
“What are you finding?”



- **WAYFI – Third Step**
- “What are you finding?”
- Continues the communication process – dialog
- Seeks independent assessment
- Dialog – synergy, a process of discovery, heuristic
- An important process redundancy



- Dialog
- Disciplined verbal communication
- Requires sharing, listening, and attention
- Training
- Practice
- Not informal conversation.



- Maintains overall situational awareness
- Each pilot performs Monitoring function for the other
- Allows PF to listen and evaluate reports
- PF maintains distance –**Notices**
“Does this make sense?”



- Creates specific roles and communication that avoids both pilots from missing the gorilla in the basketball game
- Avoids task over-concentration causing us to miss other important information – hazard information – subsequent threat and error mgt.



- “What are you finding?”
- As information is reported the PF is in the position to notice **anomalies**
- Anomalies are things that don’t make sense
- Cali, Colombia “*That can’t be right*”
- How important are anomalies?
- Compass needle pointing to the problem



- Instead of discarding anomalous information –
- “What if it is true?”
- “What could this be telling us?”
- Maybe, doesn’t make sense because it doesn’t fit our mental model BUT we did NOTICE it.

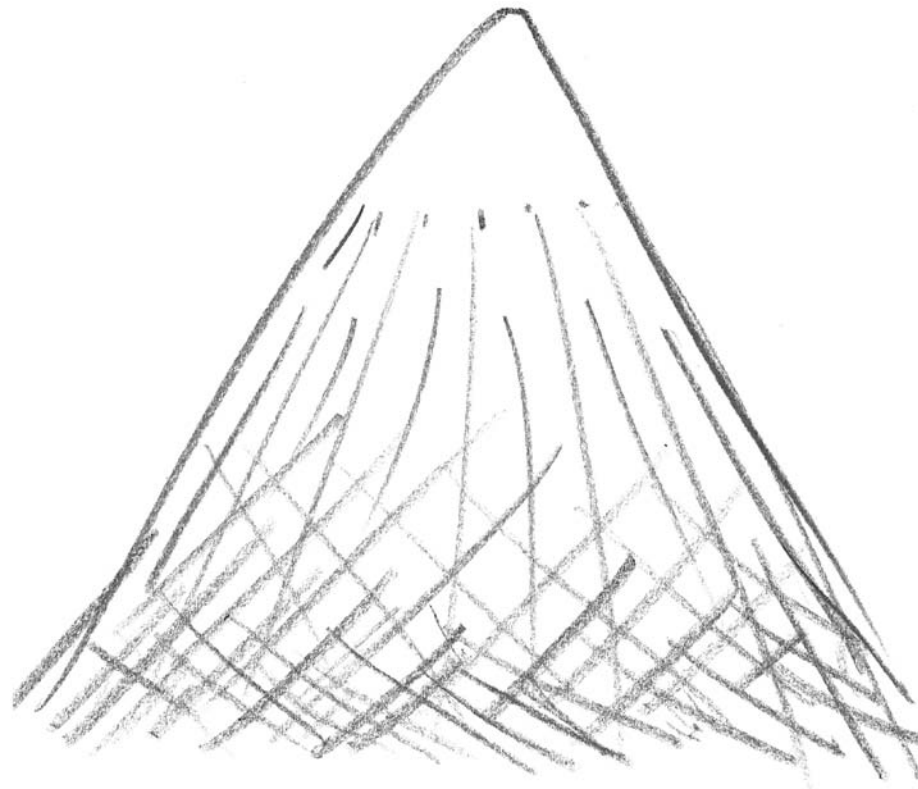


- **Noticing** is a primary mental mechanism that makes the IHTAR process work
- Noticing is an important threat detection function





- Product of interest, knowledge, and experience
- Happens automatically
- Subconscious processing of information
- Subconscious processing –remembering of names
- Noticing is the result of cognitive integration – visual, memory, cognitive and intellect



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- Mechanism that makes SCANNING work.
- It is probably the reason why it is easier for us to scan analog rate and trend displays rather than digital.



- “Huh” is the verbalization of noticing
- Two usages of “Huh”
- Don’t ignore the “Huh”
- Recognition of a relationship at the subconscious level
- Because product of our interest, knowledge, experience it should not be ignored



USC Viterbi B 737 NG Unsecured Panel

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- “Huh. I wonder why that panel is open in the first place.”
- “The Little Voice”



- IHTAR recognizes the natural reaction to over-concentrate in emergency situations
- Fight or flight physiology
- IHTAR maintains one pilot with ability to NOTICE – maintain peripherality (S/A)
- Notice things that don't make sense and can lead to a solution of the situation



- **Fight or Flight**
- Increased heart rate Apollo 11 Armstrong 156
- Blood flow to muscles
- Tunnel vision
- Auditory exclusion
- It is time we teach pilots about stress, stress response, behavior and performance under stress



- The more we know, the more we can notice.
- Novelty is the most attractive type of input for our brains
- Memory not a photo but a survival tool
- Sully - opportunity to learn
- IHTAR – implies personal and organizational responsibilities.
- We need to ensure that our policies and procedures are designed to mitigate stress effects



- IHTAR goes beyond a challenge and reply or cockpit event resolution
- Personal / Professional responsibility
- Organizational responsibility
 - Captain as mentor – a responsibility of command
 - Respect on-going learning
 - Professional curiosity
 - Learning Culture



- **Dynamic Maneuver Monitoring – DM2**
- When the PF executes any dynamic maneuver of the aircraft
- The PNF exclusively monitors
- Avoids any extraneous conversation
- Avoids doing checklists in turns
- Doubles the NOTICING ability
- Avoids causing any distractions



- **IHTAR SUMMARY**
- Communication protocol
- Managing situations where the nature of the event/problem is unknown or uncertain
- Managing beyond “Startle” events



IHTAR

HITSI

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KRES





- Establishes first priority – fly the aircraft
- Assigns roles
- Initiates dialog – mechanism of discovery
- Maintains one crew member with ability to NOTICE – maintain peripherality and SA



IHTAR

“I have the aircraft and radios; you’ve got everything else.”



HITSI

“Here is the way I see it.”



- Recognizes that subconscious processing is real and is a valuable tool in identifying problems



WAYFI
“What are you finding?”



- Step 1 – IHTAR training for simulator instructors
- Step 2 - Optional training protocol for crews displaying difficulty
- Step 3 - Collect data from crews and instructors
- Step 4 - Analyze data
- Step 5 - Expand training to pilot cadre based upon results
- Step 6 – Continue data collection and refinement of IHTAR procedure
- Step 7 – Tailoring – If you tailor it; share that.





- Guidelines available
- Document
- *IHTAR Implementation – Rationale and Procedures*
 - University of Southern California, Viterbi School of Engineering, Aviation Safety and Security Program
 - by Captain Chris Nutter and Thomas Anthony
 - Request digital or print: Avsafe@usc.edu



Thank You from USC