



# HUMAN FACTORS ANALYSIS AND CLASSIFICATION IN INCIDENT INVESTIGATIONS



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# BACKGROUND

## Worldclass Human Reliability

In recent years, safety leaders in high-risk industries have recognized a disproportionate trend of human contribution and causes in incident and accident investigations. In fact, it has been documented that human error is responsible for 70%-90% of identified failures, directly attributable to a breakdown in human reliability and performance. A learning organization must study this with a focus on the system of operations and how human error is produced and transmitted within it. From this we can design resiliency and barriers to recognize and respond to human error before it creates an unsafe situation. The investigation of mistakes and violations by individuals are just the beginning of an effective analysis; they are the window we must look through to find the antecedents and hidden influences that create a pathway for error to become an incident.

Other high performing global industries including military and commercial aviation, space exploration, transportation, nuclear power, oil & natural gas have studied the effect of human factors on incidents and accidents for decades and developed strategies for analysis and intervention leading to exceptional safety performance. We should learn from their lessons and best practices.

An effective investigation is the most proactive available for identifying human error and precursors leading to incidents. The Human Factors Analysis and Classification have two foundational components. investigators competent in thoroughly incidents and accidents to expose human factors. The second is a classification system designed to capture human causes and provide for organizational cross-feed of information in order to develop preemptive intervention strategies.



**“We believe that the majority of our Process Safety incidents are initiated by human error.”**

Director, Global Process Safety

*70-90% of all incidents and accidents involve human factors. By exposing and analyzing human factors in incident investigations, organizations can make corrective action to prevent reoccurrence and improve operational efficiency and safety.*

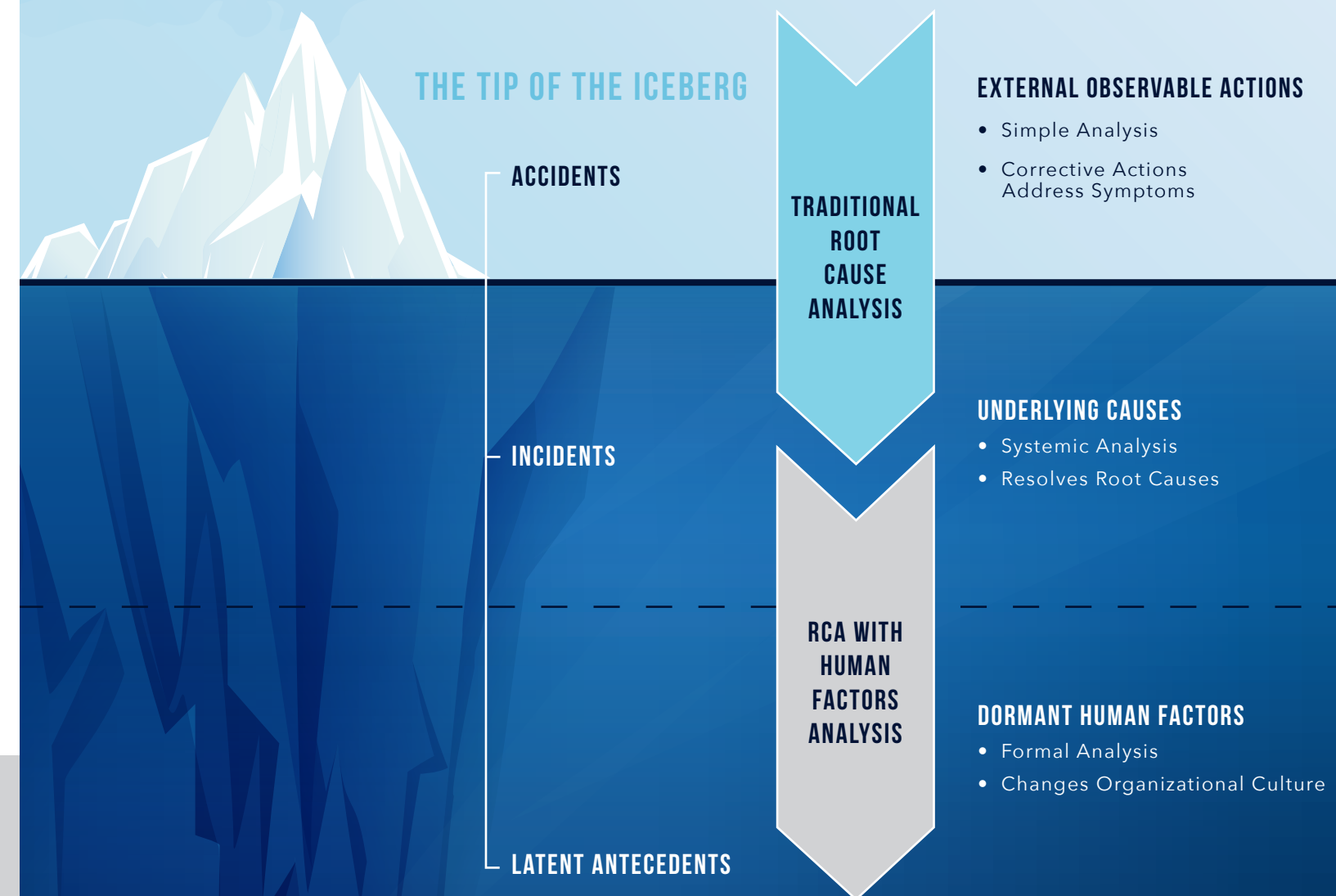
## The Evolution of Human Factors Analysis

Human factors analysis and classification has its roots in Military and Commercial aviation communities seeking to understand the human influences on failures. Because of the exceptional success in improving safety and operational performance in these sectors, this approach to human factors analysis has become a model for all industries seeking to achieve highly reliable and resilient operations.

The purpose of a Human Factors Analysis and Classification System (HFACS) is to provide for the cross-feed of human error data using a common categorization system that involves human factors and an accepted and standardized taxonomy.

An effective HFACS program serves as the baseline for:

- ✓ A systematic methodology for analyzing human error and its influences on operations as a result of incidents and accidents
- ✓ A taxonomy for classification
- ✓ A system for acquiring, aggregating and analyzing data

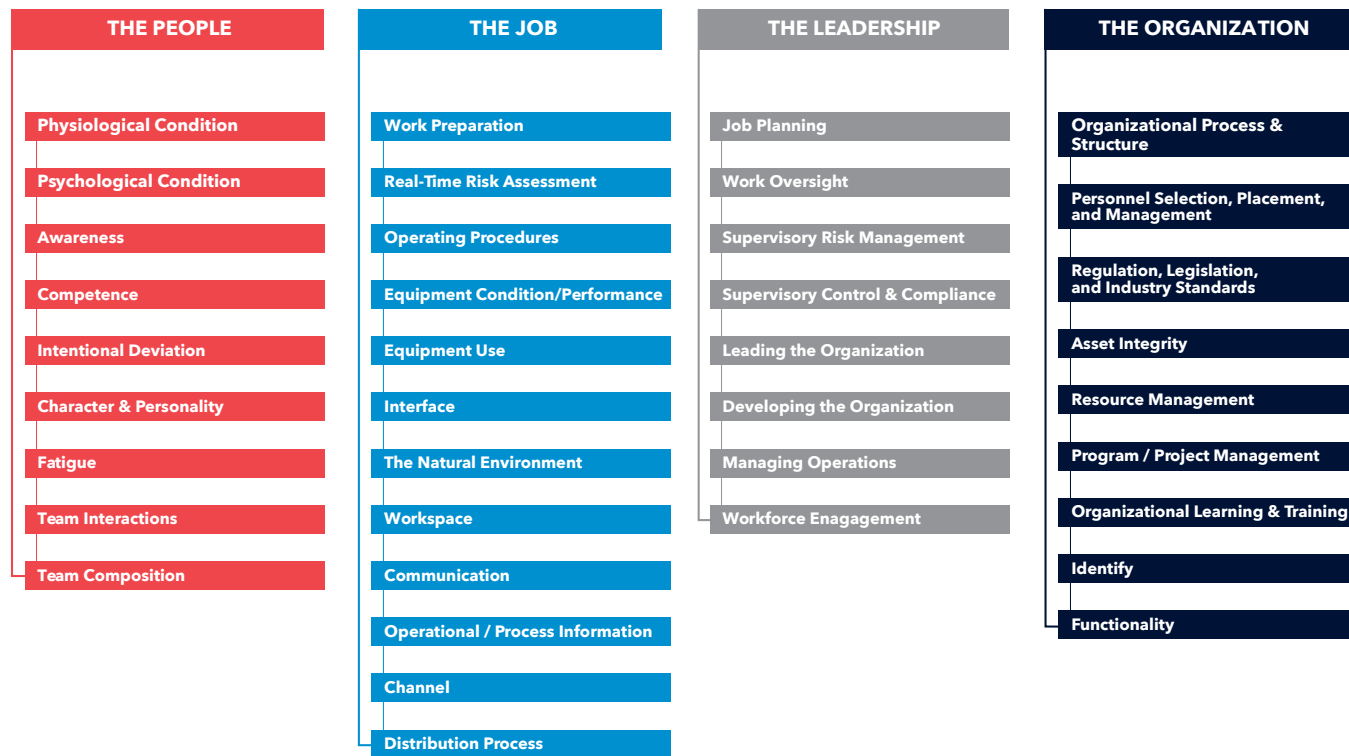


# A GLOBAL SOLUTION

## A simple solution to a complex problem

Enhanced incident investigation and root cause analysis programs with Human Factors Analysis and Classification capability will expand your ability to expose obscure human influence in your operations, apply effective intervention strategies, and affirm your commitment to creating a safety-oriented culture.

### APPLYING THE HUMAN FACTORS TAXONOMY



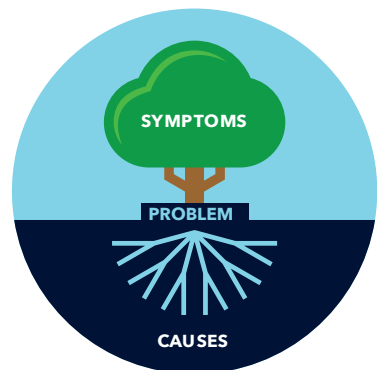
“We see Human Factors Analysis as ‘the next thing’ in advancing our safety performance.”

Vice President  
Environmental, Health and Safety

## ADVANTAGES

The advantages to this approach are:

- It is blended with universally adopted root cause analysis and investigation program and methods
- It is proven in high reliability organizations including military and commercial aviation, nuclear power and oil & natural gas exploration
- It is data driven and integrated into the RealityCharting™ software for collection, analysis and reporting



### ROOT-CAUSE ANALYSIS METHODOLOGY



# SITE SPECIFIC DEPLOYMENT TEMPLATE

A standardized approach for global implementation

In order to ensure the quality and consistency of delivery, Vetergy uses a standardized deployment template at each site. The template incorporates three general components; site introduction and planning, initial capability delivery and sustainment and mentoring.



## Site Introduction and Planning

In order to prepare for on-site activities, coordination is conducted with the site Safety and Operational leadership in order to schedule the training and workshops, coordinate training facilities and support requirements, and provide software integration and technical support.

## Initial Capability Delivery

Certified instructors conduct on-location training for leadership, supervisors and investigators. At the conclusion of this initial skills training site leadership will have a better understanding of the influence of human factors within our operations and investigators will have the capability to conduct effective human factors analysis in future incidents investigations using the RealityCharting software.



## Sustainment & Mentoring

Throughout the program life-cycle, continuous improvement and change management methods will be used. RC Pro-8 software technical support will be provided by RealityCharting. Vetergy will provide initial and continuous training for investigators and supervisors, mentoring and investigation support including independent third party investigation services when the situation warrants.



# INITIAL CAPABILITY DELIVERY

Getting started at your site

Initial competency is achieved using an "introduce, demonstrate, do" instructional strategy across three events; instructor led classroom training, a facilitated investigation workshop and an observed investigation proficiency check.



**INTRODUCTION TO HUMAN LEADERSHIP**

An introduction to Human Factors Analysis is provided to site leadership to include the operational benefits of an effective program. Additionally, this training will orient the leadership team on the schedule and intended outcome of the program along with any program specific training requirements.



**HUMAN FACTORS ANALYSIS IN INVESTIGATIONS TRAINING**

Incident Investigation Training incorporating the Apollo Root Cause Analysis methodology and Human Factors Analysis for investigators, operators and supervisors is provided in an instructor-led format. The conclusion of this training is a practical exercise to demonstrate the benefits and functionality of Human Factors Analysis and Classification by applying HFACS in conjunction with the Apollo RCA methodology.



**FACILITATED INVESTIGATION WORKSHOP**

This workshop is aimed at providing a demonstration for the student investigators on how to evaluate Human Factors as a part of the Apollo Root Cause Analysis methodology. This workshop is conducted by a certified instructor using a real-world incident, which has already been investigated in order to highlight the unique approach.



**INVESTIGATOR PROFICIENCY CHECK / MENTORING**

This workshop is designed to be conducted on a live investigation of a current incident, but can be completed using a previously investigated incident the student investigator is unfamiliar with. During this event, the instructor observes a student led causal analysis to assess the competency of the investigator in incorporating Human Factors Analysis in their Root Cause Analysis investigation.

# HUMAN FACTORS ANALYSIS IN INVESTIGATIONS TRAINING

Human Factors Analysis training is designed to give investigators the competencies to effectively expose active and latent failures within our operational systems in order to develop effective intervention strategies to prevent recurrence.

## 1 UNIT ONE Human Factors Theory

- Module 0 Introduction
- Module 1 Human Factors Theory
- Module 2 Human Factors Analysis and Classification System

## 3 UNIT THREE Investigating Human Factors

- Module 7 Data Gathering
- Module 8 Interviewing
- Module 9 Analyzing Causal Relationships
- Module 10 Interventions
- Module 11 Classification and Trend Analysis

## 2 UNIT TWO Human Factors Taxonomy

- Module 3 Individual Actions
- Module 4 Preconditions
- Module 5 Supervision
- Module 6 Organizational Influences

## 4 UNIT FOUR Practical Application

- Module 12 Case Study
- Module 13 Course Critique



Trained investigators and effective analyses are the most proactive tool we have in understanding hazards and installing adequate controls to create safe and resilient operational systems.



# KEY PRINCIPLES TO UNDERSTANDING HUMAN FACTORS WITHIN OUR OPERATIONS

- Human error is a product of today's complex operational systems
- Human error cannot be eliminated
- Complex systems are not inherently safe
- The deeper a factor's dormancy, the broader its impact
- Investigators must overcome their own bias

# ABOUT VETERGY GROUP

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The Vetergy Group is a global company comprised of three business units that provide expertise related to Human Reliability: Human Factors Analysis programs and training, supplementary manpower supply, and operational assessment. Our unique value proposition enables us to fully support the human performance requirements of our partners.

Our experience includes military human performance evaluation models and multi-million dollar incident investigations in private industry. Our goal is to become your strategic partner and advance your human reliability efforts in an efficient and professional manner.

Collectively, Vetergy Group trainers and investigators have completed hundreds of successful human error investigations. Our experienced team and disciplined approach bring a unique resource to improving human reliability.

Vetergy Group's leadership team is committed to fostering an environment of high integrity and passion for collaborative customer focus and delivery of measurable results.



*“Because our trainers are experienced military leaders and motivators our instructional techniques are more effective than a purely academic approach. Team members get energized through our trainers.”*

David Wilbur  
President, Vetergy Group

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