**HUMAN FACTORS ANALYSIS AND CLASSIFICATION SYSTEMS**

 **Definition**

* HFACS was developed by Dr Scott Shappel and Dr Doug Wiegman.
* It is a broad human error framework that was used by the US Air Force to investigate and analyse human factors aspects of aviation.
* HFACS is heavily based upon James Reasons **Swiss Cheese Model**. It provides a tool to assist in the investigation process and target training and prevention efforts.

 **THE HFACS FRAMEWORK**

 It describes human error at four levels of failures.

 In each level causal categories were developed that identify the active and latent failures that occur. One failure will occur at each level leading to an adverse event.

If one failure is corrected, the adverse event will be prevented.

 1. **UNSAFE ACTS OF OPERATORS**

 It is divided into two categories;

1. . **Errors**- These are unintentional l behaviours .They include;
* Skill based errors- these errors occur in the operators execution of a routine, highly practised task relating to procedure, training or proficiency and result in an unsafe situation .e .g checklist error.
* Decision errors- occurs when the behaviours of the operators proceed as intended yet the chosen plan proves inadequate to achieve the desired results in unsafe situation. e .g rule-based error.

Perceptual errors- occurs when operators sensory input is degraded and a

* Decision is made upon faulty information.
1. **Violations**-These are wilful disregard of the rules and regulations. They include;
* Routine violations-These are habitual action on the part of the operator and are tolerated by the governing authority .
* Exceptional violations-They are an isolated departure from authority, neither typical nor condoned by the management.

 2. **PRECONDITIONS FOR UNSAFE ACTS**

 It is divided into;

1. **Environmental factors**-Refer to the physical and technological factors that affect practices, conditions and actions of individual which result in human error.
* Physi cal environment-refers to factors that include both the operational setting (e.g weather, altitude, terrain) and the ambient environment.
* **Technological environment**-Refers to factors that include a variety of design and automation issues including the design of equipment and control, display/interface characteristics, checklist layouts, task factors and automation.
1. **Condition of operators**-Refer to the adverse mental state, and physical limitations and result in human error and unsafe situation.
* **Adverse mental state**-refers to factors that include those mental conditions that affect performance e .g stress.
* **Adverse physiological state**-refers to factors that include those medical or physiological conditions that affect performance (e.g hypoxia)
* **Physical limitations**-refers to circumstances when an operator lacks the physical or mental capabilities to cope with a situation, and this affects performance.
1. **Personnel factors**-These are off duty activities required to perform optimally on the job.

3. **UNSAFE SUPERVISION**

 It is divided into;

* **Inadequate supervision**-This is where supervisors provide their staff with opportunity to succeed and to ensure the task is performed safely and efficiently.
* **Plan inappropriate operation**-These are those operations that can be acceptable and different during emergencies but unacceptable during normal operation.
* **Fail to correct known problem**-refers to those instances when deficiencies are known to the supervisor, yet are allowed to continue unabated.
* **Supervisory violation**-refers to those instances when existing rules and regulations are wilfully disregarded by supervisors, e.g inadequate documentation.

4. **ORGANISATIONAL INFLUENCES**

 It includes;

* **Resource management** - Organization level decision-making regarding to the allocation and maintenance of organization asset
* **Organizational Climate**-Working atmosphere within the organization
* **Operational process**- Organizational decisions and rules that govern the everyday activities within an organization e .g operations.

 **USE OF HFACS**

* Provides a structure to review and analyse historical accidents and safety data
* It is a useful tool for guiding future accident investigation in the field
* HFACS helps an organization to identify hazards and implements procedures to prevent this hazards.

**APPLICATION OF HFACS**

1. Industries and organizations e.g( mining, construction, rail and healthcare)
2. Civil and General Aviation such as the FAA and NASA

REFERENCES:

* Reason, J.(1990) **Human Error’’**. Cambridge University Press
* Scott A. Shappel l(Feb 2000), **The Human Factor Analysis and Classification System**. HFACS’’ DOT/FAA/AM-OO/7.