**Hazard Analysis –**

Hazard analysis is the process of recognizing hazards that may arise from a system or its environment, documenting their unwanted consequences and analyzing their potential causes. The hazard analysis process commences with a Preliminary Hazard Analysis (PHA) in the early stages of a project and continues throughout the system product's life cycle.

The objectives of a hazard analysis are to:

* **Identify hazards.** To determine the hazards and hazardous events of the equipment under control and the control system (in all modes of operation), for all reasonably foreseeable circumstances including fault conditions and misuse
* **Identify causes.** To analyze the event sequences leading to the hazardous events identified
* **Determine risks.** To analyze the risks associated with the hazardous events.

**Hazard Analysis Methods:**

* Failure Modes & Effects Analysis (FMEA)
  + Systematic look at hardware piece by piece
  + Review of how each component could fail
  + Considers how a failure effects other components, sub-systems and systems as a whole
  + Risk assessment accomplished (severity & probability)
* Risk Assessment Code (RAC) assigned
* Fault Tree Analysis (FTA)
  + Detailed review of a specific undesirable event
  + Deductive in nature
  + Top-down effort
  + Normally reserved for critical failures or mishaps
  + May be qualitative or quantitative
* Operating Hazard Analysis (OHA)
  + Also known as Operating & Support Hazard Analysis (O&SHA)
  + “What if” tool brings user into the loop
  + Integrates people and procedures into the system
  + Diagrams the flow or sequence of events
* Project Evaluation Tree (PET) may be used for OHA accomplishment
  + Systematic evaluation of man, machine, & procedures

**Category of Hazards:**

* Catastrophic Hazard
  + Death or total system loss
* Critical Hazard
  + Severe injury, illness or major system damage
* Marginal Hazard
  + Minor Injury or system damage
* Negligible Hazard
  + Less than minor injury or system damage

**Applications of hazard analysis:**

* complex systems involving many interactions safety-critical functionality
* determined proactively and influence the requirements that will be implemented in software
* minimize the probability of human error
* Safety issues and safety attributes
* safety-critical functionality in Softwares