

Controlling Risks Safety Terminology



Introduction

- Some of the vocabulary that we use in class has been defined in the introduction.
- This module repeats some of the terms to emphasize their use.

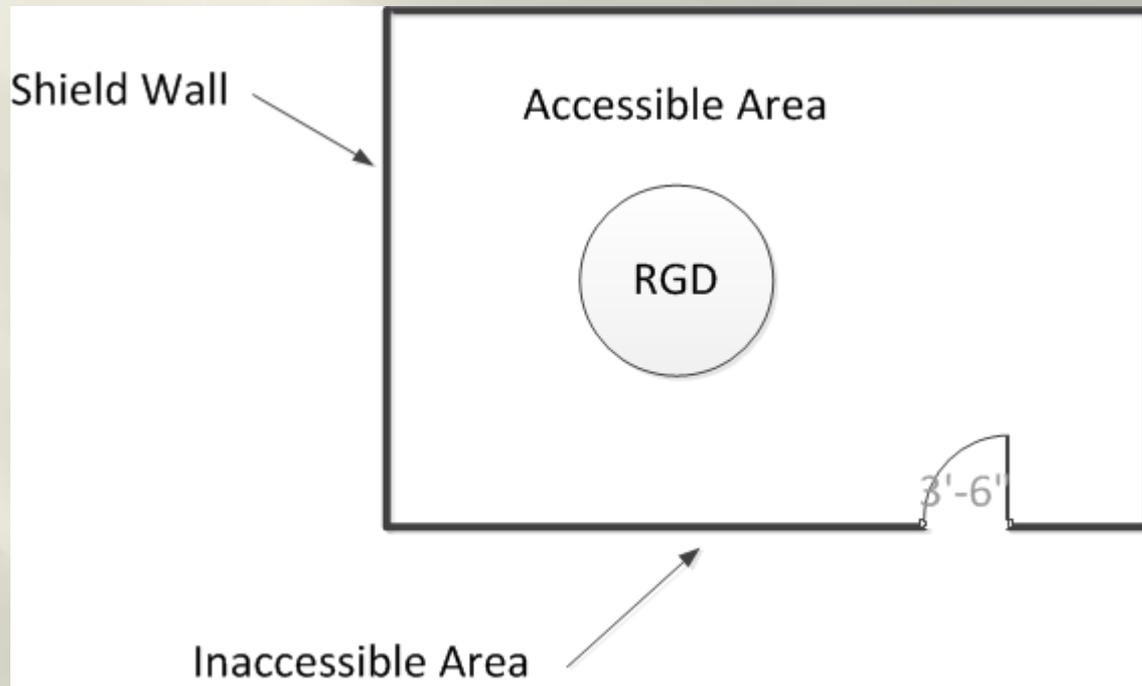


Radiation Areas

- **Radiation area:** means any area, accessible to individuals, in which radiation levels could result in an individual receiving an equivalent dose to the whole body in excess of 0.005 rem (0.05 mSv) in 1 hour at 30 centimeters from the source or from any surface that the radiation penetrates.
- **High radiation area:** means any area, accessible to individuals, in which radiation levels could result in an individual receiving an equivalent dose to the whole body in excess of 0.1 rems (0.001 Sv) in 1 hour at 30 centimeters from the radiation source or from any surface that the radiation penetrates.
- **Very high radiation area:** means any area accessible to individuals in which radiation levels could result in an individual receiving an absorbed dose in excess of 500 rads (5 grays) in one hour at 1 meter from a radiation source or from any surface that the radiation penetrates.



Accessible Area



Exclusion Area

- RGD – Radiation Generating Device
- The area around an RGD from which people must be kept out due to high levels of radiation (e.g., an RGD room with an operating Class IV RGD).



Control

Credited Control: A credited control is a control determined through hazard evaluation to be essential for safe operation directly related to the protection of personnel or the environment, is suitably addressed in a safety document (such as a System Safety Analysis) and has provisions to assure that the control is maintained (e.g. calibration, testing, maintenance or inspection) as addressed in the safety document.

Positive Control: positive control is used in areas where personnel are granted access to an enclosure by an operator having oversight for the area. The operator may be automated as in a card key access control system.



Critical Devices

- Critical devices are specific accelerator or beam line components that are used to ensure that the accelerator beam is either inhibited or cannot be steered into areas where people are present.



V&V

- **Verification:** Verification is a quality control process that is used to evaluate whether a product, service, or system complies with regulations, specifications, or conditions imposed at the start of a development phase.
- **Validation:** Validation is a quality assurance process of establishing evidence that provides a high degree of assurance that a product, service, or system accomplishes its intended requirements.



Testing

- **Black box test:** Black Box testing is a technique that uses the system requirements specification to select the test data used to examine the outputs. The test is a functional test of the system requirements without regard to the engineering design.
- **White box test:** White Box testing is a technique that uses explicit knowledge of the internal workings of the system to select the test data used to examine the outputs. The test is valid only for determining if the program diverges from its intended functionality. White box testing does not account for errors caused by omissions.
- **Functional Test:** A functional test is the systematic testing of software or hardware conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements.



Fail safe

- **Fail safe:** Fail-Safe circuits are designed for closed-circuit operation which requires that the energized or closed contact state of sensors and actuators is the normal running condition. The de-energized or open contact state is the safe state. The protective functions of the interlock system should render the energy source/system safe during the most likely interlock system failure events (e.g., loss of power/pressure, open circuit, short to ground and component failure).

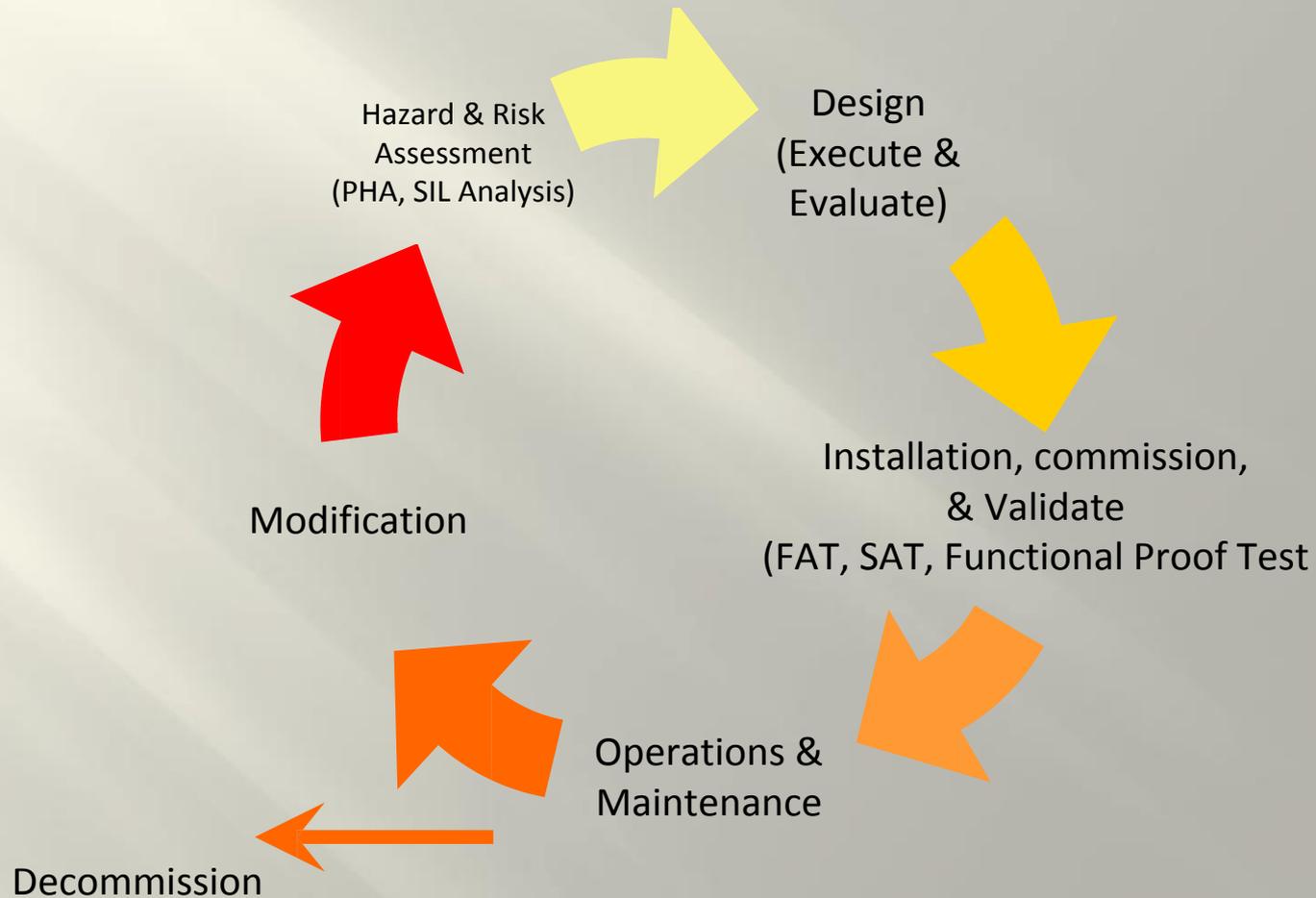


Redundant

- **Redundant:** Redundant systems use multiple, independent equipment arrangements such that each interlock system is isolated from the others to perform similar safety functions such that any single failure will not result in loss of protection.



Safety Lifecycle



PFD

- **Probability of failure on demand:** The probability that a device will fail to return the process to a safe state when required.



Vocabulary Story Time

- The English language has the ability to be technically precise. However, as we become technically educated we forget that others do not have the same appreciation or respect for the vocabulary that we use. Therefore, the terms that we use casually are often used by others in a way that is technically incorrect.
- This is your opportunity to add to the vast wealth of understanding we have about the English language as applied to safety systems and your anecdotes of vernacular colloquialism.

