

Critical systems requirements 1

Name:

1. What are business requirements?

Requirements that define how the business will benefit from a system and that define how the risks to the business can be minimised.

2. What are safety requirements?

Requirements that identify risks to the system, undesirable conditions to be avoided and fundamental safety features that must be included in the system.
Specific requirements that define how risks are to be reduced.

3. What is an accident trajectory?

A series of (generally) undesirable events that co-occur in time. For example, failure of an emergency power supply occurring at the same time as a lightning storm that causes a power outage.

4. What are active and latent failures?

Active failures are unsafe conditions that initiate an accident trajectory

Latent failures are vulnerabilities in one or more layers of the socio-technical system.

5. What are safe requirements? Give an example?

Requirements that are intended to reduce active failures in a system. Specification that input shall be from a menu rather than a keyboard avoids the input of out of range values.

6. Why is a model of safety requirements engineering that is designed for protection systems inappropriate for more general critical systems engineering?

Because its focus is on systems that are rarely used. It tends to encourage an approach where the designers build in defences against failures rather than avoiding initial conditions that result in failure.

7. Why should insulin not be delivered when the glucose sensor reading is below a given value?

Insulin delivered at this stage would further reduce the blood glucose and this is potentially dangerous for people who suffer from diabetes.

8. Why is the computation of insulin requirements based on the rate of change of blood glucose rather than its absolute value?

Because the objective is to maintain the blood glucose level within a safe band. If we simply use the absolute value then we can't tell if the natural metabolic processes are such that the insulin will be in this band.