HW3 Ch 3, 4, & 5

Due Sep 7 at 11:30pm **Points** 25 **Questions** 21 **Time Limit** None
Allowed Attempts 2

Instructions

Read Chapters 3, 4, & 5 in your textbook *Hazard Analysis Techniques for System Safety*, 2nd Edition, Clifton A. Ericson II (2016).

Answer the questions.

You are allowed up to **two** attempts to take the quiz. Your score will be the **average** of your attempts.

This is an individual assignment. Collaboration or sharing answers with other students is considered cheating.

Study Pro Tips:

- Before you attempt the quiz, read the materials once through, highlighting any important concepts, or making annotations in your book or notes.
- As you complete the quiz, keep your reading open in front of you and refer back during the quiz.
- Refer to your lecture notes and take additional notes as you take the quiz.
- After you take the quiz, make additional notes for future reference and exams.

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	1,231 minutes	17.89 out of 25 *

* Some questions not yet graded

Correct answers are hidden.

Score for this attempt: **17.89** out of 25 *
Submitted Sep 6 at 5:30pm
This attempt took 1,231 minutes.

Question 1 1 / 1 pts

Which of the following is **NOT** a published definition of the term "Risk" in the text?

- An expression of the impact and possibility of a mishap in terms of potential mishap severity and probability of occurrence.
- (selected) To put in danger of loss or injury.
- Hazard, peril, or jeopardy.
- A combination of the severity of the mishap and the probability that the mishap will occur.

Section 3.2

Question 2

1 / 1 pts

For the following incident scenario, identify the hazard components

HS-IM-TTO

Flammable gas storage vessel	Hazard Source (HS)
Pinhole leak in vessel/ignition source	Initiating Mechanism (
Vapor Cloud Explosion	Target/Threat Outcom

Section 3.6

Question 3

1 / 1 pts

A hazard has a probability of either 1 or 0 of existing.

- (●) True
- ( ) False

Section 3.10

Question 4

1 / 1 pts

These are intermediary occurrences that, when fail, aggravate or contribute to an incident scenario.

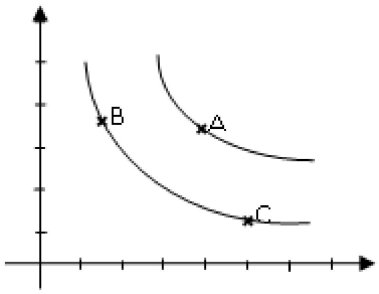
- (●) Pivotal Events
- ( ) Threat Outcomes
- ( ) Target Outcomes
- ( ) Initiating Events

Section 3.4 & Appendix B

Question 5

1 / 1 pts

There are three points A, B, and C on the risk plane shown in the graph below. Which statement best explains the relationship?



- Risk A > Risk B = Risk C
- Risk A = Risk B > Risk C
- Risk B > Risk A > Risk C
- Risk A = Risk B = Risk C

Ch 3 and lecture notes

Question 6

1 / 1 pts

The _____ is intended to systematically identify and evaluate the hazards of hazardous materials, and propose measures to eliminate or control these hazards through engineering design changes or protective measures to reduce the risk to an acceptable level.

- Human Health Design-HAT
- Operations-HAT
- Conceptual Design-HAT

System Design-HAT

Section 4.3.6

Question 7

1 / 1 pts

_____ analysis involves the use of numerical data in the analysis and provides a more objective and accurate result, provided that input data is valid

Subjective

System Safety

Quantitative

Qualitative

Section 4.10

Question 8

1 / 1 pts

What is the difference between a primary and secondary hazard analysis technique?

Primary Hats are completed before Secondary HATs.

Primary HATs are complete, formal methodologies, secondary HATs support the primary HAT.

- [ ] Secondary HATs always use Primary HAT data
- [ ] Secondary HATs fills any holes left by the Primary HAT.

Section 4.8

Question 9

1 / 1 pts

Which of the following is a key element of the Preliminary Design HAT?

- ○ Identify toxic effects of system operations.
- ○ Generate a list of system level hazards.
- ○ Develop detailed Indentured Equipment Lists.
- ◉ Identify Safety Critical Functions (SCF) and Top Level Mishaps (TLM)

Section 4.3.2

Question 10

1 / 1 pts

The _____ evaluates the system performance and support functions including use, test, maintenance, training, storage, handling, transportation, and demilitarization or disposal, identifying hazards that can be eliminated or mitigated through design features and modified procedures when necessary.

- ○ System Design-HAT

- [x] Operations Design-HAT
- [ ] Human Health Design-HAT
- [ ] Requirements Design-HAT

Section 4.3.5

Question 11

1 / 1 pts

Hazards resulting from the intrinsic nature of the components, equipment, or processes in the system, such as hazardous materials, energy sources, or safety-critical functions are called _____.

- [ ] timing hazards
- [x] inherent hazards
- [ ] latent hazards
- [ ] induced hazards

Section 5.5

Question 12

1 / 1 pts

Which of the following would be considered a Design Safety Feature?

Check all that are correct

- [ ] Hot Work Permit
- [x] Redundant component
- [ ] Portable Fire Extinguisher
- [ ] Lock-Out Tagout
- [x] Interlock
- [x] Fail-safe mechanism

Section 5.2.7

Question 13

1 / 1 pts

What is a common mistake that system safety analysts make when starting a hazard analysis process?

- (●) Jumping into a system and immediately start identifying what they think are hazards, without considering the system architecture.
- ( ) Not identifying root causes
- ( ) Identifying the consequences
- ( ) Not considering budget.

Section 5.2.1

Question 14

1 / 1 pts

What is the main difference between Hazard Analysis and Root Cause Analysis?

Check all that are correct

- [x] RCA looks for causal factors to a known problem.
- [ ] HA is reactive.
- [x] HA looks for the potential problem and causal factors involved.
- [ ] RCA does not assess risk.
- [ ] RCA is only used for Incident Investigation.

Section 5.1

Question 15

1 / 1 pts

If a system operator is forced into committing errors because of confusion in a poorly designed layout of a multitude of switches, gauges, and displays, this would be an example of a(n) _____.

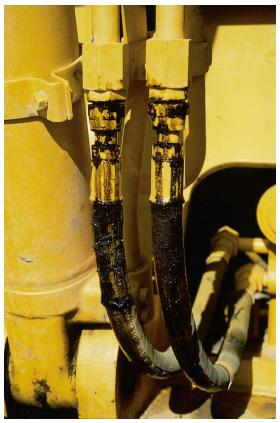
- (•) Human System Interface (HSI) hazard
- ( ) timing hazard
- ( ) inherent hazard
- ( ) hardware induced hazard

Section 5.5

Question 16

Not yet graded / 1 pts

Using the method described in 3.12 of your book, write a clear, concise, and descriptive hazard description for the photograph of the backhoe hydraulic lines shown below.



Identify the Hazard Source (HS), Initiating Mechanism (IM), and Target/Threat outcome (TO) in your description.

Your Answer:

The picture illustrates two backhoe hydraulic lines connecting the pipes and two valves. Aging and corrosion on the lines' covering could be observed in this figure, leading to further leakage and could pollute the environment and damage the machine.

Hazard Source (HS): The bolts at the joints of the lines

Initiating Mechanism (IM): Oil leakage

Target/Threat Outcome (TTO): Pollution to the environment and damage on the machine.

Section 3.12

Partial

Question 17

0.89 / 1 pts

Provide the following Acronyms meanings mentioned in Chapter 3.

Must be exact for full credit - capitalize the first letter of each word

HCF Hazard Causal Fac

IE Initiating Event

PE Pivotal Event

HS Hazard Source

IM Initiating Mechanisr

TTO Target/Threat Outc

HE Hazardous Elemen

TLM Top-Level Mishap

SCF Safety-Critical Func

Answer 1:

Hazard Causal Factor

Answer 2:

Initiating Event

Answer 3:

Pivotal Event

Answer 4:

Hazard Source

Answer 5:

Initiating Mechanism

Answer 6:

Target/Threat Outcome

Answer 7:

Hazardous Element

Answer 8:

Top-Level Mishap

Answer 9:

Safety-Critical Function

Ch3

Question 18

1 / 1 pts

Provide the following Acronyms meanings mentioned in Chapter 4.

Case sensitive - Must be exact for full credit - capitalize the first letter of each word

- **CD-HAT** Conceptual Design
- **PD-HAT** Preliminary Design
- **DD-HAT** Detailed Design Ha
- **SD-HAT** System Design Haz
- **OD-HAT** Operations Design

- **HD-HAT** Health Design Haza
- **RD-HAT** Requirements Desi
- **PRA** Probabilistic risk as

Answer 1:

Conceptual Design Hazard Analysis Type

Answer 2:

Preliminary Design Hazard Analysis Type

Answer 3:

Detailed Design Hazard Analysis Type

Answer 4:

System Design Hazard Analysis Type

Answer 5:

Operations Design Hazard Analysis Type

Answer 6:

Health Design Hazard Analysis Type

Answer 7:

Requirements Design Hazard Analysis Type

Answer 8:

Probabilistic risk assessment

Ch4

Question 19

Not yet graded / 5 pts

Describe a real-world example for each of the following categories of hazards:
No credit given for examples listed in text

1. Inherent Hazard
2. Timing Hazard
3. Latent Hazard
4. Systemic Hazard
5. Common Cause Hazard
6. HIS Hazard
7. Organizational Hazard
8. Operational Hazard

Your Answer:

1. Inherent Hazard: Poisonous Chemicals
2. Timing Hazard: Electronic Circuit Aging leading to fire hazard
3. Latent Hazard: Hazard caused by designs that did not considerate the cultural differences
4. Systemic Hazard: Bridge collapsed due to the improper calculation on the wind load
5. Common Cause Hazard: Spare circuit fails at the same time due to the heat generated by the current at the same time when operating circuit fail
6. HIS Hazard: Unergonomic design like the too high chairs or too short handles for tools.
7. Organizational Hazard: Disagreements within the organization lead to estrangement and reduced ability to cooperate.
8. Operational Hazard: Operator does not follow the guide by related standards, which caused the incident.

Section 5.5

Question 20

1 / 1 pts

Provide the following Acronyms meanings mentioned in Chapter 5.

Case sensitive - Must be exact for full credit - capitalize the first letter of each word

- **HA** Hazard Analysis
- **RCA** Root Cause Analys
- **SMM** System Mishap Mo
- **TLM** Top-Level Mishap
- **HRI** Hazard Risk Index
- **SSR** System Safety Req
- **HTS** Hazard Tracking Sy
- **SSP** System Safety Prog
- **SME** Subject Matter Exp
- **SSWG** System Safety Wor
- **HRI** Hazard Risk Index
- **DSF** Design Safety Feat
- **HSI** Human System Inte
- **HCP** Hazard Causal Path

Answer 1:

Hazard Analysis

Answer 2:

Root Cause Analysis

Answer 3:

System Mishap Model

Answer 4:

Top-Level Mishap

Answer 5:

Hazard Risk Index

Answer 6:

System Safety Requirement

Answer 7:

Hazard Tracking System

Answer 8:

System Safety Program

Answer 9:

Subject Matter Expert

Answer 10:

System Safety Working Group

Answer 11:

Hazard Risk Index

Answer 12:

Design Safety Feature

Answer 13:

Human System Integration

Answer 14:

Hazard Causal Pathway

Ch5

Question 21

Not yet graded / 1 pts

Consider the photo shown below of a chemical storage tank. Assume the chemical contains flammable and toxic properties.

a. Write a hazard description for the image. Use the hazard description methodology described in Section 5.4, including HS, IM, and TTO.

b. Create a System Mishap Model mind map similar to those found in Figures 5.1, thru 5.6 in the book. Identify and label the TLMs, TLCs, TLH, SPF, Hazards, and HCP.

Use electronic means for creating the System Mishap Model mind map.

Hand sketches will not be accepted.

Xinyu Hazard HW3 Ch 3,4,5 Description.docx
(https://canvas.okstate.edu/files/15211884/download)

Section 5.4

Quiz Score: **17.89** out of 25