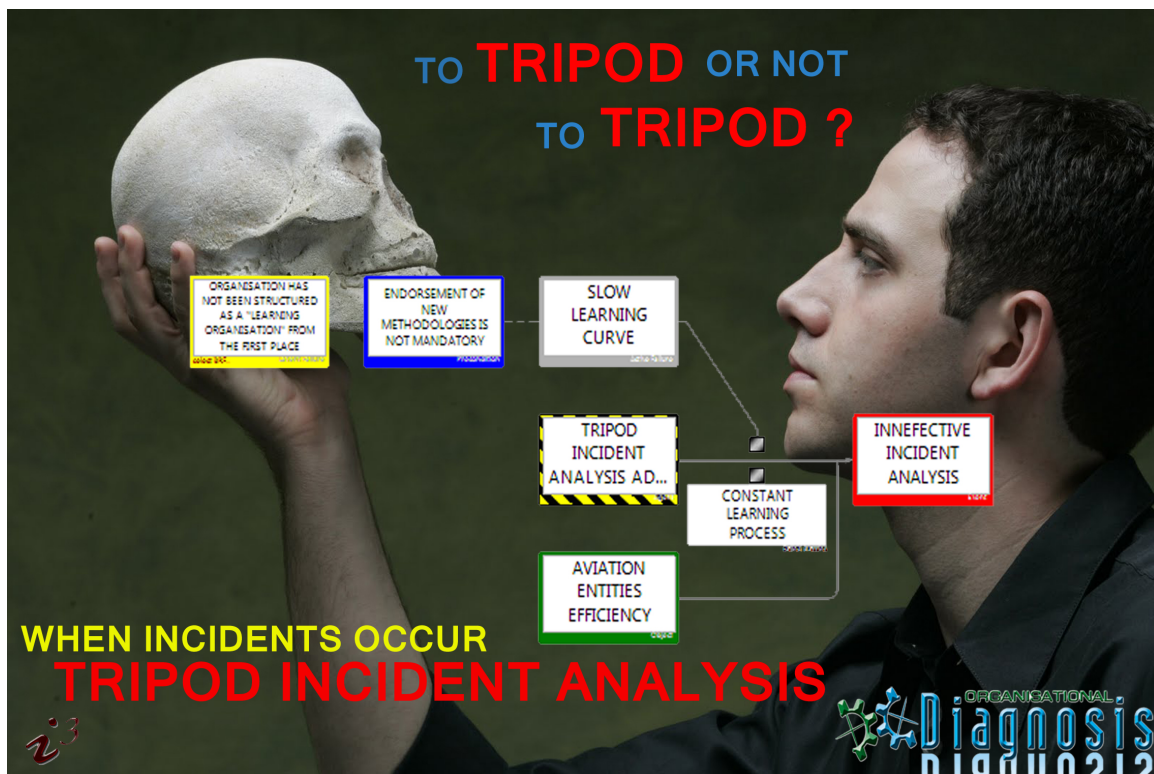


San José State University  
**Aerospace Engineering**  
AE297 – Special Topics in Aerospace Engineering

Spring 2016

TRIPOD Accident Investigation in Aerospace Environments



**INSTRUCTOR INFO**

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Office Hours: TBA

**Class Days / Time**

Saturday 30 January: 09:00 – 18:00  
01 – 05 February: MTWRF 19:30 – 22:00  
Saturday 06 February: 09:00 – 18:00  
08 – 12 February: MTWRF 19:30 – 22:00

<b>Classroom</b>	Engr.164
<b>Prerequisites</b>	None
<b>Co-requisites</b>	None
<b>Credit</b>	3 units

**Textbook** Instructor Notes

**Description** Students work individually and in teams to enhance their professional skills, as they relate to safety. The TRIPOD accident investigation methodology is used as the vehicle for students to realize that an aerospace environment requires a positive stance for sharing information and learning from mistakes, if a safety culture is to be developed. By investigating an accident in an aerospace environment, students will acquire the essential technical skills to participate in any accident investigation. Furthermore, they will be prepared to play a dynamic role in establishing a safety culture in any aerospace organization.

More specifically, students will gain essential theoretical and practical knowledge in accident investigation, so they maintain an energetic role in developing a safety culture in the aerospace / aviation industry. This includes the familiarization with key elements of the risk management process, the accident management evolution over the years, essential terminology for investigators, accident causation theories, the leading role of the Swiss model in human error theory and the contribution of the HFACS model in accident analysis. Finally, the TRIPOD concept will be analyzed to help students develop their first TRIPOD Beta trees.

### ***Course Goals***

1. Provide students with accident investigation skills via the application of the TRIPOD methodology.
2. Offer students an opportunity for going beyond the acquisition of technical expertise, into people skills, as they relate to safety.
3. Develop students' creative abilities in dealing with complex situations, like aviation accidents, and learning from their own mistakes as well as the mistakes of others.
4. Develop an appreciation of the interrelationship between organizational culture and safety.
5. Develop students' judgment as well as their confidence in creating TRIPOD Beta trees and reaching underlying causes of accidents.
6. Develop students' oral and written communication skills, so they can play a positive role when participating in an accident investigation team.
7. Make students aware of the importance of synthesis and teamwork in accident investigation and provide them with an opportunity to develop team and leadership skills.

**Course Learning Objectives**

By the end of the course, students should be able to:

1. Perform conceptual and preliminary design of a safety management system.
2. Define an appropriate set of requirements and sketch the profile of a safety management system.
3. Define the characteristics of an appropriate organizational culture for the aviation / aerospace industry.
4. Evaluate the configuration of an organizational culture for a sustainable accident prevention ratio in aviation / aerospace.
5. Describe the pros and cons of a collaborative type organizational culture.
6. Evaluate the various accident causation theories and distinguish those appropriate for use in aviation / aerospace.
7. Describe how organizational culture and the way it is managed within a high-risk entity is firmly connected to overall safety performance.
8. Prepare a full accident report via the application of TRIPOD accident methodology and present the findings of the accident, barriers, active failures, preconditions, and underlying causes.

**Grading**

Grade	Minimum Score
A+	950
A	900
A-	850
B+	800
B	750
B-	700
C+	675
C	650
C-	625
F	624 or lower

- 75% based on team performance (design of a full accident report)
- 25% based on individual performance (design TRIPOD Beta tree)

**Topics**

Week Topics

- 01 The risk management process in the aviation / aerospace industry.
- 01 Organizational culture; Safety culture as predictor of safety performance.
- 01 Efficient organizational culture types in the aviation / aerospace industry.
- 01 Accident management over the years.
- 01 Accident causation theories.
- 01 Swiss cheese and HFACS models.
- 01 The TRIPOD concept.

- 01** *1<sup>st</sup> Report due*
- 02 Building a TRIPOD Beta Tree.
- 02 Which TRIPOD-TRIOS to involve?
- 02 Identification of the right barriers in a TRIPOD Beta Tree.
- 02 1<sup>st</sup> case study: Barrier analysis.
- 02 **Discussion (Workshop)** – 2<sup>nd</sup> case study: Creating the causation path (active failure – preconditions – latent failures)
- 02 Overview of supporting software for TRIPOD investigations (Investigator3).
- 02** *2<sup>nd</sup> Report due: Application of TRIPOD analysis individually.*
- 03 The accident investigation process as teamwork.
- 03 Making the right questions during an accident investigation.
- 03 **Workshop** – 3<sup>rd</sup> case study: Creating the causation path (active failure – preconditions – latent failures – reaching underlying causes – basic risk factors).
- 03 SMS measurement with TRIPOD methodology.
- 03 The relationship between TRIPOD analysis and safety culture mapping.
- 03 4<sup>th</sup> case study – The HELIOS accident.
- 03** *2<sup>nd</sup> Report due: Application of TRIPOD Analysis in teams.*