Safety Critical Systems

NTEC N-30

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Executive Summary

This report is for the NTEC-N30 course in Safety Critical Systems. Section one is a design brief for a system to stop a pram, section two is the analysis of a second design brief on the same subject. The design briefs were created during the week long course at the University of Lancaster. The briefs are broken down in the manner shown below

Task One	**Task Two**
Customer Requirements	Requirements Quality
Engineering Requirements	Functional Decomposition
A Functional decomposition	Chosen Technologies
A Design Idea Shower	Safety Attributes
A HAZOP	HAZOP
Design Outline	Risk Assessment
A Failure mode and Effects Analysis	Safety Case
A Functional Tree Analysis	
A Safety Case	

Table 1: Design Brief Breakdown for Tasks One and Two

1 Design Report on Pram Emergency Brake

The group was given the task to create a design brief for an automated pram stopping device. The device was meant to satisfy the both customer and engineering requirements, whereas the design was to include documents and consideration of safety case analysis.

¡—-Report should be at least five pages excluding diagrams or FTA. Worth 60% of the report, 5 marks per heading——¿

1.1 Customer Requirements

A discussion was held with another group who played the part of the customer, this was to represent real world interaction with the end user. Through a collaborative process a list of requirements was generated.

Task One	

Table 2: Customer Requirements

1.2 Engineering Requirements

Include functional safety requirements

1.3 Functional Decomposition

Note and new requirements arising from decomposition

1.4 Design Idea Shower

to include rejected ideas and reason why rejected

1.5 Design Outline

Black box level modules of design, ie callipers brake levers etc

1.6 HAZOP

1.7 Qualitative Risk Assessment

High/Med/Low consequence/probability for the top two hazards

1.8 FMEA

for one module, only correct or incorrect output states

1.9 FTA

for the system, again assuming only correct/incorrect output states

1.10 Safety Case

For the system. What an organisation would be expected to do. Providing an example of each key context, environment, design process, quality.

> System operates satisfactorily in a range of temperatures -5 to + 30 Environmental test conducted

2 Safety Assesment Report on Competing Pram Emergency Brake

Can use multiple examples to illustrate good and bad practise. Minumum two pages of text not including diagrams or cut and past sections of other peoples work

2.1 Requirements Quality

Use one or two examples to illustrate good and bad practice

2.2 Functional Decomposition

Comment on the depth of breakdown and suggest better approaches

2.3 Chosen Technologies

Comment on, appropriate, risk, cost

2.4 Safety Attributes

adequacy of safety attributes of the final design

2.5 HAZOP

comment on completeness, if anything is missing

2.6 Risk Assessment

Is it realistic

2.7 Safety Case

Adequacy of claims, quality of the arguments, evidence. Include what you think would be adequate

Figure 1: Appreciative Enquiries 5D cycle[**?**]

A Rolls-Royce HR comments

Table 3: A collection of unused phrases from Rolls-Royce HR dept

HR catch phrases
HR is about creating a supportive organisational context
If a well designed team is the seedling then the organisational context is the soil
Its about Self Directed Teams and growing peoples capability such that they are able to effect required change in the areas that they work. A leaders role is to create a supportive environment to allow this to happen.
The reward system reinforces the motivational benefits of challenging direction, and demonstrates the organisation cares enough to expend resources on the team.
We listen and respond to the team, providing balanced feedback
Listen and respond to the team members concerns
Encourage team members to expose problems, whilst challenging them to consider solutions
Provide support without removing responsibility
Create an environment of trust
Be innovative about how you recognise excellent performance
A Team gets line of sight when they understand what is required, what the metric of success is, and how their collective behaviour directly shapes and triggers these rewards
It is managements job 365 days a year to motivate the workforce - not the reward structure
Employees need to feel cared about, listened to and part of the business. Employee Engagement should help address what is stopping you from making the best contribution you can make to our business
Globally employees need to know that they have a voice but more than that they need to know that what they are saying is being listened to which I plan to continue to champion in my role as your Sponsor
Never give up emphasizing the criticism of management bull***t talk.