



UNIVERSITY OF WALES TRINITY SAINT DAVID
ENGINEERING APPLICATIONS AND STUDY SKILLS
ACMA4007

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INTRODUCTION

- More than 7 years experience in automotive industry within quality department
- I have participated in the launch of Aston Martin DB11 and the first SUV DBX
- During my work, among other things, I have carried out the final inspection of the cars, as a result of which thousands of Aston Martin have an inspection plaque with my name on them
- I started Mechanical and manufacturing engineering degree apprenticeship program at UWTSD in 2019

<https://twitter.com/philmw/status/1239180899725512706>

https://www.youtube.com/watch?v=xNjE7SI_H2w

https://www.youtube.com/watch?v=-BXjpX_Vmdw



Hi! My name is Viktoria Berces. Let me introduce myself.

I have more than 7 years experience in automotive industry within quality department. One of the biggest accomplishment of my career was being involved in introducing DB11 and DBX. The best part of my job was doing final inspection and giving my name to those cars.

I stated this course in 2019 to gain more knowledge and develop my career.

<https://www.google.com/search?q=viktoria+berces+final+inspection&sxsrf=ALeKk01Q8rcIfm9xha3PEImISWZhPyNEFA:1615891648998&source=Inms&tbm=isch&biw=1920&bih=937#imgsrc=2BjkEIBqfwbCZM>

INTRODUCTION

The aim of this presentation is to discuss the learning outcomes of UK engineering council Accreditation of Higher Education Programmes - AHEP - requirements for Mechanical and manufacturing engineering course

This presentation was made for engineering applications and study skills module. This Mechanical and manufacturing engineering course is an accredited course so the purpose of this presentation is to highlight the requirements specified by the Engineering council.

CONTENT

- *D6 – Communication of work to technical and non-technical audiences*
- *EL5 – Awareness of relevant legal requirements governing engineering activities including personnel, health and safety, contracts, intellectual property rights, product safety and liability issues*
- *G1 – Applications of skills in problem solving, communication, information retrieval working with others and the effective use of general IT facilities*
- *G2 – Plan self-learning and improve performance as a foundation for lifelong learning and continuous professional development*

D6 – COMMUNICATION OF WORK TO TECHNICAL AND NON-TECHNICAL AUDIENCES



- Formal communication: information is exchanged through predetermined channels, long communication chain. More reliable, but slow. Communication is usually in writing, so there is an evidence.
- Informal communication: exchange of information doesn't follow any channels, free flow of information. Less reliable but fast. No documentary evidence. Employees can discuss work-related issues, but disadvantage is spread of rumours.

Firstly, I will talk a bit about the D6 – Communication of work to technical and non-technical audience.

We distinguish between 2 types of communication.

The fundamental differences between formal and informal communication are the followings:

Formal communication: information is exchanged through predetermined channels, long communication chain. More reliable, but slow. Communication is usually in writing, so there is an evidence.

Informal communication: exchange of information doesn't follow any channels, free flow of information. Less reliable but fast. No documentary evidence. Employees can discuss work-related issues, but disadvantage is spread of rumours.

A good example of the difference between the two is the process of developing quality inspection processes, in which I myself participated. The development of the inspection process flow first started with informal communication, i.e. communication with technicians and engineers, then outlining the plans and selecting the best of them and then verifying the operation of processes by testing them. Then formulating an improved inspection process flow to suit both the non-technical and technical audience and putting them all in writing according to the defined standards.



- *Explaining ideas to non-technical audience*
 - *Paying attention to the audience during the presentation*
 - *Using visual content for better explaining and understanding of the technical information and processes.*
 - *Using humor or incorporate storytelling*
 - *Avoiding lingo when possible*

Every industry has its own language and terminology, as does the automotive industry, for example. I know from my own experience that, for example, in training new starters with no previous experience in a given industry, it is best to avoid jargon, pay maximum attention to their reactions, facial expressions, and try to use visual aids for better comprehension.

EL5 – AWARENESS OF RELEVANT LEGAL REQUIREMENTS GOVERNING ENGINEERING ACTIVITIES



- Personnel
- Health and safety
- Contracts
- Intellectual property rights
- Product safety and liability issues

We distinguish between several types of requirements, expectations, regulations such as personnel, health and safety, contracts, intellectual property rights, product safety and liability issues.

EL5 – PERSONNEL LEGAL REQUIREMENTS



- Engineering ethics consists of the responsibilities and rights that engineers must uphold, as well as the desirable ideas and personal commitments in engineering work. Engineering ethics can be summarized as a set of studies of decisions, rules, and values that are morally expected in practice and research.

- Professional engineers must adhere to the codes set by the Engineering council. The fundamental principles are the following:
 - "Honesty and integrity
 - Respect for life, law, the environment and public good
 - Accuracy and rigour
 - Leadership and communication."

(Engineering council, 2017)

EL5 – HEALTH AND SAFETY LEGAL REQUIREMENTS



Health and safety at Work 1974 and The Management of Health and Safety at Work Regulations 1999

- The basis of British health and safety law is the Health and Safety at Work etc Act 1974. The act sets out the general duties for employers, employees, defines what employers are required to do to manage health and safety under the act.
- These regulations apply to every work activity.
- The employers must provide PPE and carry out risk assessment, look at what the risks are and take measures to protect the employees.

EL5 – HEALTH AND SAFETY LEGAL REQUIREMENTS



Besides the Health and Safety at Work Act itself, the following apply across the full range of workplaces:

- 1 *Management of Health and Safety at Work Regulations 1999*: require employers to carry out risk assessments, make arrangements to implement necessary measures, appoint competent people and arrange for appropriate information and training.
- 2 *Workplace (Health, Safety and Welfare) Regulations 1992*: cover a wide range of basic health, safety and welfare issues such as ventilation, heating, lighting, workstations, seating and welfare facilities.
- 3 *Health and Safety (Display Screen Equipment) Regulations 1992*: set out requirements for work with Visual Display Units (VDUs).
- 4 *Personal Protective Equipment at Work Regulations 1992*: require employers to provide appropriate protective clothing and equipment for their employees.
- 5 *Provision and Use of Work Equipment Regulations 1998*: require that equipment provided for use at work, including machinery, is safe.
- 6 *Manual Handling Operations Regulations 1992*: cover the moving of objects by hand or bodily force.
- 7 *Health and Safety (First Aid) Regulations 1981*: cover requirements for first aid.
- 8 *The Health and Safety Information for Employees Regulations 1989*: require employers to display a poster telling employees what they need to know about health and safety.
- 9 *Employers' Liability (Compulsory Insurance) Act 1969*: require employers to take out insurance against accidents and ill health to their employees.
- 10 *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)*: require employers to notify certain occupational injuries, diseases and dangerous events.

- 11 *Noise at Work Regulations 1989*: require employers to take action to protect employees from hearing damage.
- 12 *Electricity at Work Regulations 1989*: require people in control of electrical systems to ensure they are safe to use and maintained in a safe condition.
- 13 *Control of Substances Hazardous to Health Regulations 2002 (COSHH)*: require employers to assess the risks from hazardous substances and take appropriate precautions.

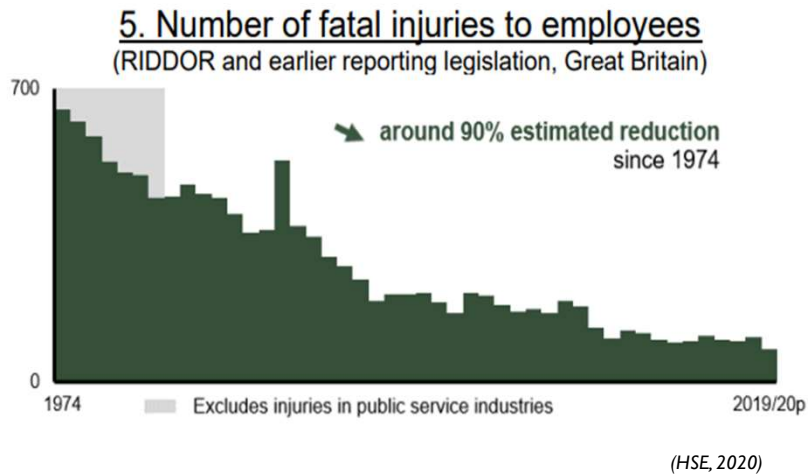
In addition, specific regulations cover particular areas, for example asbestos and lead, and:

- 14 *Chemicals (Hazard Information and Packaging for Supply) Regulations 2002*: require suppliers to classify, label and package dangerous chemicals and provide safety data sheets for them.
- 15 *Construction (Design and Management) Regulations 1994*: cover safe systems of work on construction sites.
- 16 *Gas Safety (Installation and Use) Regulations 1994*: cover safe installation, maintenance and use of gas systems and appliances in domestic and commercial premises.
- 17 *Control of Major Accident Hazards Regulations 1999*: require those who manufacture, store or transport dangerous chemicals or explosives in certain quantities to notify the relevant authority.
- 18 *Dangerous Substances and Explosive Atmospheres Regulations 2002*: require employers and the self-employed to carry out a risk assessment of work activities involving dangerous substances.

(HSE, 2013)

In addition to the basic provisions, each industry or department within a company has its own specific health and safety provisions that they must comply with. For example, an automotive company has additional provisions in the paint department or in the body in white department where they work with hazardous materials.

EL5 – HEALTH AND SAFETY LEGAL REQUIREMENTS



As can be seen from the graph, the number of fatal accidents has dropped by 90 percent since the Health and Safety Act came into force in 1974. It is therefore of the utmost importance that all persons to whom these provisions apply are aware of their content and, of course, comply with them.



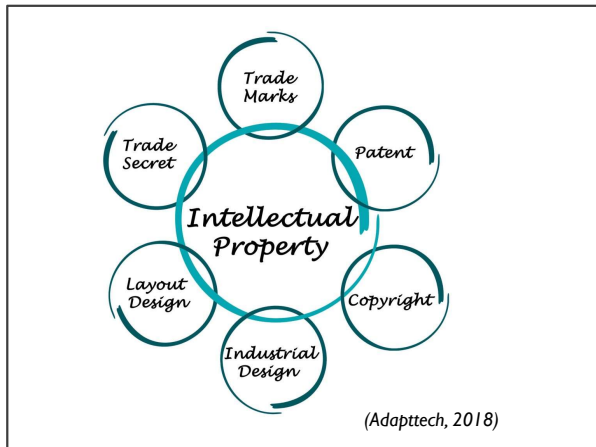
CHEN HOU
2018/12/14

5 ESSENTIAL INGREDIENTS OF A CONTRACT



(Burgielaw, 2016)

- An agreement is reached when one party makes an offer to the other and this offer is accepted by both of them. The party receiving the offer must state that it has accepted the offer. If the value is not exchanged, the contract will not live. The parties all agree to enter into a legally binding agreement and should be aware of what this entails.



- Intellectual property is a product of the creative mind
- Intellectual property right – moral and legal protection to the product
- Trademarks: Apple, McDonalds, Aston Martin etc.
- Copyright: books, films, songs etc.
- Patent: mainly in manufacturing design, design of a product
- Layout design: that could be a web design, graphic design etc.
- Industrial design: Mini Cooper, Coca-Cola bottle etc.
- Trade secret: recipes in food or beverage industry etc.

EL5 – PRODUCT SAFETY AND LIABILITY ISSUES



- *The General Product Safety Regulations 2005 (GPSR)*
- *Consumer Protection Act 1987*
- The basic aim of the Product safety rule is to provide customers with a product on the market that they can use safely and function as intended. However, if manufacturers and service providers are still unable to provide such products or services and cause harm to users, the customers should have the opportunity to complain and claim compensation.

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*GI – APPLICATIONS OF SKILLS IN PROBLEM SOLVING, COMMUNICATION, INFORMATION RETRIEVAL
WORKING WITH OTHERS AND THE EFFECTIVE USE OF GENERAL IT FACILITIES*



- Problem solving
- Communication
- Information retrieval
- Working with others
- Use of IT facilities

Since I started this course, my problem-solving and analysis skills have improved a lot, thanks to the complex mathematical tasks, through various physical and thermodynamic calculations, to basic programming in Matlab.

I was also introduced to a new creative program, Solidworks.

Furthermore, thanks to the course, I am now able to write dissertations that meet the needs of the university, including references.

I can also say that I have made progress in gathering and processing. The preparation of technical reports required experiments and the preparation of diagrams and graphs.

It was also an opportunity to work together as a team during an experiment, which was a good practice to improve teamwork.

My IT knowledge also expanded with the introduction of new programs such as Matlab and Solidworks, as I mentioned earlier. My knowledge of Excel, Word and Powerpoint has also improved, thanks to the training.

*G2 – PLAN SELF-LEARNING AND IMPROVE PERFORMANCE AS A FOUNDATION FOR
LIFELONG LEARNING AND CONTINUOUS PROFESSIONAL DEVELOPMENT*



- To acquire, use and adapt the knowledge gained here.
- Completion of further trainings.
- Striving for continuous development in the professional field.

Thanks to the engineering design subject, which makes me even more interested in digital manufacturing, I'm currently doing an Autodesk Fusion 360 course as well. Nevertheless, I would like to use the knowledge gained here and use it in my work. I would like to work as an engineer and solve problems with the knowledge acquired during the training and the ever-evolving analytical thinking.

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