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| **Competence** | **Description** | **Evidence** |
| 1. **Knowledge and Understanding** | Review and select appropriate techniques, procedures and methods to undertake tasks. | I was given a document that detailed all the measures required to maintain full compliance with the MOD’s Acquisition Safety and Environmental Management System (ASEMS) for defence equipment. The business unit I was working within needed a document produced that details the instructions, guidance, and support in accordance with ASEMS. I then used Project Orientated Environmental Management Systems (POEMS) to understand the environmental management required at the concept level. Having obtained an overview of the tasks relevant to the project, my job was to review the most appropriate methods to access the actionable tasks used in the Forward Action Plan (FAP).  I decided that applying a method to categorise tasks would help to make the document more concise but would not highlight main concerns. For this reason, a colour coding system was used, and external information of the progress made towards fulfilling the requirements would also be detailed within the document. This meant that it could be used to track the progress of each aspect of the POEMS and collate a breakdown of tasks to achieve it. My final report included the categorising of actions from the list of Forward Action Plans along with their strengths and weaknesses. I highlighted things which had been overlooked and not focussed on enough or contained ambiguous statements. My conclusion wrapped up my in-depth analysis and included my own take on the document. |
| Use appropriate scientific, technical or engineering principles. | I attended a weeklong Trident Equipment Support Trainer (TEST) 01 course in Faslane to obtain the necessary technical knowledge required for my role within Maritime Mission Systems (MMS), more specifically working in the Safety and Environmental Management Systems team for the Common Missile Compartment (CMC) of the Vanguard class submarine. I obtained a certificate for this course, having achieved 100% in the final test, proving I could apply the technical knowledge obtained during the week and my role. This scientific knowledge was utilised while working on material management plans for the CMC, alongside producing documents for TSPT, where I had to understand how materials would act in a variety of environments, and the outcome of contact. My job required a combination of scientific knowledge to understand materials, technical knowledge of the equipment used in the design of the CMC, and an in depth understanding of the engineering principles necessary to identify and manage the correct methods needed to meet the SEMS legislation.  I was a member of the Fast Navy Drone Target team. It consisted of three members, and my initial role was to research components that would be used to build various iterations of drones. The task required identifying the necessary equipment needed to achieve a variety of goals outline in the project scope. I used my knowledge from my degree to research how each component would interface with the system, and the additional research into drone hobbyist’s builds to understand the performance of the drone with different configurations. The engineering principle of maintainability was evidenced in the detailed file, using OneNote, where the day’s work was heavily documented. This file was used to create an in-depth step by step guide of what I did, how I did it and the challenges I faced. It also included the test results of equipment and confirmation of functionality, and in a lot of cases it involved documenting how I overcame problems and errors with components not working correctly. This file existed as a guide to install, configure and test all the drone hardware and documented various settings for the proof-of-concept presentation.  The logbook was also used to document the settings, methods and problems. I was able to produce a step-by-step guide on how to calibrate equipment and tests its interface to the drone. This proved to be vital when working in short sprints as my output was increased due to documenting every step the first-time round. All these steps gave me a great insight into the required capability of the software, along with the software diagrams I created for visual aid.  Further Understanding:   * Current placement, understanding electrical principles to select components. * How to calculate various important values for operational amplifiers. * Evaluating important characteristics against a range of criteria determined by the business unit. * Testability, maintainability, integrity and external integration. * The ethics behind the component justification. * Management of resources, such as tools, equipment, components and time. |
| 1. **Design, development and solving engineering problems** | Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions. | During my role as a member of the technical team in DST, Technical Queries were assigned to me with a brief overview of the case itself. This often involved a short explanation on the test engineers’ issues with equipment or software, and not an identification of the problem itself. I decided to use the Kepner Tregoe method because it allowed me to identify the root problems and their causes. It also allowed to make informed decisions by focusing on solving those problems specifically. I was then able to communicate the problems to other engineers in a more direct manner and obtain relevant information quickly.  The method itself involved carrying out an initial situation appraisal to highlight concerns and prioritise the actions. For example, one technical query, there was a task in which a single piece of equipment had become damaged and there was no replacement, but it was urgently required to carry out tests for the MOD and return their equipment in time. I knew that these MOD asset cases required an immediate fix and then a plan to mitigate the risk of failure in the future. I had to not only provide a quick solution, but also think ahead about the products lifetime and identify all possible causes of a fault in the first place to design them out of the new iteration. I had to document the reasoning for my actions and exactly how my own actions solve the problem The equipment was up and running within a week, and I defined an appropriate deadline for the final solution. I then managed resources to complete the task, and through my work I was able to learn from others and contribute to the workshops output.  The official outcome of identifying problems with the Kepner Tregoe method was a detailed breakdown of the who, what, where and when that I detailed within a technical note. By using a method that gets you straight to the point of identifying causes, I saved time and was able to successfully get said equipment up and running with a high level of urgency. I also had a concise report created simply by using the method template, which detailed the decisions I made throughout the process of obtaining a satisfactory solution to a problem.  During my industrial placement, I identified a problem related to PCB defects in the Electronic Repair Facility within Babcock’s Combined Weapons and Electronics Workshop. It was clear to me that the test engineers spent a lot of time inspecting PCBs that had been delivered to the workshop as faulty. These test engineers were responsible for the maintenance and repairs of the entire workshop, and the manual method of inspection just to identify the faults was far too time consuming.  The problem I had identified and wished to overcome was related to the efficiency of the fault identification process. These tasks were taking far too long to carry out, and with a larger range of more complex PCBs coming into their cycle, it would not be a sustainable method to use. I pitched the solution, which I then completed as my university bachelor’s project, of creating a bench-top device that utilised machine vision to carry out accelerated initial health checks of the PCBs. By creating a bench top device, the ability to automate the feeding in of PCB could easily be introduced, and the prototype had ample space to manipulate boards, increasing the chances of capturing every detail. Machine vision was used to process all the information captured, and make rapid decisions, both of which in a fraction of the time it would take a human to do manually.  The device consisted of a 4K camera and Intel’s RealSense depth perception camera to manipulate boards and obtain detailed images from every angle. The device could identify differences in boards to outline potential damages, reading all integrated circuit values and storing all information on a database for identifying trends. This device could recognise boards with a high percentage of similarities as the same design by accessing the database. This allowed the system to compare a damaged board with the ideal template, and within seconds the test engineers were able to receive an output image of all possible faults on the board highlighted.  The system I created exceeded its required goals by reducing the inspection time, allowing the engineers to use their time efficiently to fix the PCBs instead. I had also discovered additional applications throughout the process, such as storing a list of the components from decommissioned PCBs. This allowed the test engineers to search for components they needed while repairing boards and locate them from the unused PCB store, using recycled parts to increase the life of commissioned equipment. This aided the workshop to overcome additional problems, such as electronic-waste and component shortages. |
| Identify, organise, and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact. | I supported the optioneering, down selection and concept design phase of the Fast Navy Drone Target (FNDT). I produced a bill of materials for the different types of drones selected and documented my research and findings to create a proof-of-concept design. I produced tables to compare microcontrollers based on their specification, cost and arrival time. I was able to balance cost with quality to find high standard components that would operate safely while filling the requirements needed. A justification profile was produced for each component, a task I have often undertook as both a student and employee elsewhere within Babcock, to show that I had considered the specification and the environment whilst making my selection.  My Responsibilities:   * The bill of materials evaluated cost vs quality, with major importance during the initial testing and development sprint to minimise budget loss upon obtaining damage to the drones. * The ground control software had to incorporate additional safety measures, so that the drone’s location in reference to the frigate did not compromise the safety of the crew. * Other safety precautions involved testing emergency landings, what would happen upon a crash in the water for example. I managed and disposed of equipment safely if components did become damaged. The equipment I chose had increased structural integrity as it I identified the environmental impact of replacing said equipment would be rather high. * Hardware, firmware, and software selection ensured full compatibility going forward and they aligned well with the intended function of the drone. This reduced waste by ensuring that each component would interface with the system correctly, and that the batteries we ordered were suitable. * Learning about the bidding process, producing valuable data and accomplishments in a format that I could present to stakeholders. This included being critical of my own work to ensure it was of a high quality. * Travelling, communicating and liaising with engineers throughout the UK. This also included careful consideration to the environment, we travelled together and used public transport when we did not have to transport equipment. |
| 1. **Responsibility, management and leadership** | Work reliably and effectively without close supervision, to the appropriate codes of practice. | SEMS Tasking - There was no formal deadline, but I was assigned the task at the start of June and aimed to present my final report within the month, accounting for review periods and feedback. I’m pleased to report that I met that deadline and received plenty of appraisal along with feedback for the next time I authored another document. I thoroughly enjoyed this task ownership experience as it was beneficial to developing my understanding of assurance processes.  A technical query was produced for the Waveguide Air Dryer System (WADS Monitor) as it was failing multiple tests in the procedure. I supported the procedure’s author and current test engineers in finding an alternative solution to the problems with calibrating the humidity sensor. I was able to carry out the procedure with the engineers and explore different theories to confirm the root cause of the problem. I had to become comfortable with every step of the testing, document outcomes from different approaches and work within the constraints.  Produce models and drawings to create a drawing pack that can be used to manufacture multiple products for various applications. I supported production to adjust the design to accommodate for their changing requirements while maintaining standards. I recorded key decisions regarding the design and parts used in the form of an Engineering Change Proposal. One of the design projects had a much shorter deadline, testing organisational skills as I adapted my schedule to prioritise the design work. |
| Accept responsibility for the work of themselves or others. | I assigned and tracked team tasking with a Kanban board on Azure Dev Ops. We reviewed the board bi-weekly but held short scrum meetings every morning to highlight any potential issues we would be facing for that day. I demonstrated good planning skills by logging my daily activities, outlining next actions, bringing about continuous improvement. I found this method of working very beneficial to keeping my schedule full but not overloaded as we could always raise concerns first thing in the morning. |
| Accept, allocate and supervise technical and other tasks. | Lead a team to solve outstanding issues with the Dual Channel Amplifier test rig in the Electronic Repair Facility (ERF). It involved assigning tasks and organising my team members, situational analysis (Kepner-Tregoe) and presenting my findings to Chief Engineers to inform decisions. I allocated time for checking in with my team throughout the project and highlighting potential setbacks to keep the project progressing. I worked alongside stakeholders to produce a solution while referring to the test procedure throughout. We used a peer review system on our minutes and technical notes, this meant that there was an author, checker, and approver for all the documents produced. Before important milestone meetings I would send out an agenda to all attendees to ensure that we would all enter the meeting with the knowledge required to come to a decision. |
| 1. **Communication and interpersonal skills** | Communicate effectively with others, at all levels, in English. | I have communicated effectively with a range of students of different ages, colleagues with different professions and used various mediums to converse. I have volunteered throughout my entire university experience, both internal and externally, to engage with the community informally – be it social events with the use of social media or nationally recognised competitions. External engagement involved previous placements, studying health and social care before my career change. These placements took the form of work within care homes and a period of volunteering with Age UK, the UK’s principle elderly support charity. Working in such an environment required effective communication to fulfil the resident’s interpersonal engagement needs while overcoming various challenges, such as hearing impairments or dementia.  I have engaged with primary schools, both local and international, including a talk to students in Qatar. This required cultural sensitivity training and regular engagement with the teachers to adapt the topics to the focus group of 8/9 year olds. The session itself involved an overview of programming, what robotics is and a presentation of the robot I had designed. I had created a triceratops robot, with the intent to create a flat-packed design that could easily be transported and distributed with instructions suitable to the target age range.  Writing café and PALs, to tailor feedback to an individual’s needs. Additional needs and alternative ways of delivering material that is suited for various approaches to learning and learning styles. Adapting within the session if I am delivering content visually, and certain students require a more hands on approach.  I have pitched ideas at innovation meetings to electronic engineers, mechanics and those with no STEM background at all. I have conveyed the structural breakdown of software and hardware in a manner that everybody in attendance can understand. When pitching my idea for a PCB inspection unit I used diagrams and flow charts to illustrate how the data would safely and securely pass through the system, and how different aspects of the projects tied together to perform a board assessment. Discussing my project to students in different year groups allowed me to practice my presentation skills and explain the concept to others without being undermining and remaining concise.  I have experience with communicating with students of all ages throughout higher education, primary and secondary schools. These students did not necessarily study STEM topics, but I could cater to their understanding. I could summarise part of design or go into the required depth depending on the audience. I can present my work with the use of visual aids that are not just scientific technical drawings. I am aware and frequently seek to improve the understandability of both my academic work and presentations to suit the needs of all people. Whether I am aware that somebody is neurodiverse or not, I still adopt the approach of using specific colours, language, and text to make my work accessible to all. I am capable of interpreting body language well, I can identify when somebody has understood what I have told them or if I should continue to go into more depth without making, for example, students feel wary of their knowledge. Many of these approaches have often been adapted in the moment. Many of the revision sessions I have run have new students attending each time, and they always have varying levels of understanding. |
| Work effectively with colleagues, clients, suppliers or the public. | I held a meeting to present the drones to pilots so we could develop flight test plans and procedures together. It gave us an opportunity to go through our configurations in a way that we could all understand and focus on things such as the centre of gravity, aerodynamics, and placement of components. We discussed the helpful graphical user interface features previously used by them, and what they felt needed improvement so we could make our applications more suitable.  I have often had to handle multiple requirements from different sectors, all with different ideas of what an appropriate solution would be. I have combined thoughts, ideas, and my own personal research for successfully produce outcomes that please different stakeholders. This has been a useful skill when working in a customer facing job, although they may not understand the technicalities behind the work I produce, I can communicate effectively to ensure we both understand the demands behind the requirements. I am also capable of being objectively critical and honest when I believe that the workload is not achievable within a time, or perhaps not the best way of solving a problem. In the past, this has helped me to form more mutually beneficial relationships with my colleagues. I like to remember that although they are not in my immediate development team, they are still a part of the wider team and so we should approach them and the larger projects with the same ethics.  With my sponsored project, Babcock was considered as the customer and so I ran bi-weekly meetings with set agendas to cover the progress of the project amongst potential problems, component considerations and orders with plenty of time in advance.  I have worked in small scrums, adopting agile methodology, with a range of engineers from different disciplines. Some team members were on site every day, others were hybrid. The weekly sprints had meetings every day at 7am to give an overview of the previous day's work. It was incredibly fast past, productive and problems seemed to arise more regularly but also be resolved in a more efficient fashion. For example, I was having some technical difficulties with an autonomous platform that would prevent the next test flight from going ahead if it was not fixed within 2 days. I had to be able to document every single step up until the point of failure, the decisions I made along the way and what code I had altered. I used the appropriate tracking tools and utilised the fact that we had been approving each other’s code, to work alongside the colleague on fixing the problem directly. Due to the team working so well together, I was able to fully focus on this project while they completed other tasks. The project manager was happy for us to do this, as I had reported the issues in detail immediately. |
| Demonstrate personal and social skills and awareness of diversity and inclusion issues. | While on placements I had to meet entirely new teams every four months. To get to know my team and their roles individually I would try to call each member for an introductory chat – often engaging in the weekly coffee talks. Through reaching out, I would obtain additional small tasks to vary my workload and different areas of knowledge and build mutually beneficial relationships throughout the team. For example, I became friendly with a group electronic and mechanical engineers through our shared interest in STEM events. From this, we developed a group that would meet regularly to review other skills, highlight more events and discuss opportunities to demonstrate our competence as engineers.  I have helped to run multiple science and technology related societies during my studies, as well as attending others that help me to meet people outside of my course. I am part of the transgender and non-binary support group on the University of Plymouth campus, as I am a transgender man. I recognise that these spaces are a great place to support others, talk about everyday life and even help others to understand how they could support us. In addition to this, I make sure that I place my pronouns on Teams, Zooms and my email signature so that other students recognise that I am approachable and an advocate for inclusion.  I have taken training course in diversity and inclusion throughout my academic journey and industrial career. The events I have attended range from feminism talks to seminars on how I can help students who have English as their second language. These have been closely related to my student facing jobs, such as a Writing Café Mentor but in the workplace the premise remands the same. I aim to build a positive and safe environment where everyone embraces each other’s differences. I have always recognised that people work best when you facilitate their needs, whether it’s a calmer and quieter environment or simply just asking how you could help them complete a task if they are visibly distressed. I value the importance of simple conversations where you discuss what makes you comfortable and how you like to work, as well all have unique minds and this is a beautiful thing.  I have been able to deal with more difficult situations that have required the help of external services. I have been trained to spot the signs of distress and appropriately sign post students to receive the help they require if it is beyond my capabilities. |
| 1. **Personal and professional commitment** | Understand and comply with relevant codes of conduct. | The Combined and Electronics Workshop in Devonport Royal Dockyard have their own design process which I had to follow when completing technical queries. Depending on the areas in which the equipment operated, I also had to complete the required tasks in the right order whilst complying to the Defence Systems Technology framework too. Likewise, the Energy and Marine Technology group had their own governance process which I make it my own personal responsibility to become familiar with when I was operating in that specific business unit.  Babcock’s company code of conduct revolved around conducting business honestly, transparently and with integrity. I am confident that all of the work I completed and projects I contributed to were approached in the right manner, and in accordance with the high standards that Babcock strive to achieve. I have evidenced that I am also capable of upholding high ethical standards in line with those defined by the Engineering Council. This has ensured that I have completed my work with the necessary due diligence and have embarked on tasks having completed the appropriate training. I have attended weekly Time Out for Safety meetings that ensures I know how to keep myself and others safe in my immediate workspace and the entire dockyard. These meetings were used to discuss potential hazards, new visitors and even covered general safety around the home.  The Engineering Council code of conduct has defined the standard which I personally place on myself, throughout work and studies. I’m focused on my own personal development, engaging in regular reflection to maintain and improve my own professional knowledge. I act with integrity, treat others with respect and build appropriate relationships with my colleagues. I have accepted full responsibility for my work and incorporate considerations of the environment into many aspects of my day-to-day work. I have been and am well prepared to continue reporting concerns about the safety of both people and the environment, as well as avoiding conflict. I can communicate effectively with clients, stakeholders, colleagues, fellow students, lecturers and guests.  These guidelines also match with those of the IET and IEEE in relation to   * Wiring Regulations * Code of Practice for Inspection * Code of Practice for Electrical Safety Management * Code of Practice for Electric Vehicle Charging Equipment Installation (for my own interest). * Renewable Energy |
| Understand the safety implications of their role and apply safe systems of work. | ISO-45001 – Occupational Health and Safety Management Systems  ISO-9001 – Quality Management Systems  ISO-14001 – Environmental Management Systems  Babcock is accredited by the three International Organization for Standardizations above. During my time as a Babcock employee, I abided by such frameworks to ensure I was completing tasks in a safe manner, in accordance with ISO-450001. I have completed risk assessments for project whilst working in CWEW and during my studies during university. This has shown that I am aware of the risks, and I can take actions to mitigate against them. I have undergone various training course in safety and ensuring that I kept up to date with my regular online courses for working in CWEW, the ERF and the dockyard.  As a result of producing risk assessments, I understand the safety requirements and intended use of components before I even purchase them. I regularly enforce the two-person rule and ask my colleagues to check over equipment with me before I power a system. I always carry my own PPE, acknowledge and speak up about signs for additional PPE, and ensure that I work in a clean and tidy workspace. I engage with those within my immediate surroundings before conducting tests. I make myself familiar with emergency stop buttons, exits and extinguishing equipment. |
| Understand the principles of sustainable development and how to apply them in their work. | I understand that sustainable development involves ensuring that I am educated on the matter, and the way in which I approach tasks and the design decision I make can have a negative impact on the planet. Throughout my career, I have had to select power systems, motors and materials to create the chassis for each device. I have always considered the principles related to these, as a given. However, during my time at Babcock I grew as an individual and have actively changed parts of my everyday life to abide by these principles outside of work. I am responsible for my own consumption as well as the production of systems which I design. I am innovative with my approach to solving a problem in extraordinary ways to avoid the use of harmful products.  I often carried out other tasks also related to environmental concerns, such as implementing a carbon footprint tracker into the budget forecast for travel so the team could track their efforts towards the company becoming carbon neutral by 2040. I came up with this idea while studying how to calculate accurate carbon footprints with Low Carbon Engineers within the Environmental Strategy team. Other smaller tasks have been incorporated into my everyday work life as part of Babcock’s goals to reduce their own emissions. I have attended talks on, and provided talks and presentations to others, on the Group’s Zero 40 Plan. I had educated myself outside of work by getting involved in  The projects I have worked on have been designed and built to last. Whilst working in the Electronic Repair Facility I actively worked on repairing and maintaining equipment to increase its life. Everything within CWEW is designed with repairability in mind to prevent waste and increase through life operation as well. I have regularly led and engaged in life cycle assessments of products and have greatly explored the implementation of circular economy within my personal projects. This is namely my bachelor’s project that focused on reusing components from ‘e-waste’ to repair in service equipment. To define the objectives of this project, I proactively engaged with multiple employees from different companies to design a system that would be appropriate for their applications. Often, this involved smaller companies who had to make certain decisions with a greater negative impact on the environment than they would wish to produce, purely because they did not have a choice. Through a pragmatic approach, I was able to find balance in the solution and consider the future of such devices to recognise its full potential and what the prototype I produced, and testing could grow into. |
| Carry out and record the Continuing Professional Develop (CPD) necessary to maintain and enhance competence in their own area of practice. | During my industrial placement year, I began to explore the IET’s career manager with a mentor. Each four-month placement I focused on competencies relevant to the work that my role entailed. I would highlight competencies or skills that I felt I needed to improve and then review them bi-weekly to ensure I made regular progress. I would then aim to work within a specific department that advertised tasks related to the skills I aspired to get and discuss further opportunities to include in a long-term plan. I have remained in contact with my industry advisors and mentors whilst finishing my degree.  I have created a 5-year career plan to outline what training I would like during my Master’s year and future graduate schemes. This has helped me to regularly engage with other people in a similar position to me, working together to guide each other in the right direction of the training we would like, as well as getting contacts and networking. It has also helped me to remain focused on extra-curriculars and contribute to additional projects alongside my studies. |
| Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner. | As an individual, I am aware of how whatever I do, and wherever I may be, I must not only act responsible for my actions as they influence the company’s reputation, but I must anticipate how my actions and words would be perceived in the wider world. It is vital to take the due diligence, as advised by the documents provided by Babcock, to assess the situation and tailor the approach accordingly. Each employee has the responsibility to partake in ‘whistle blowing’ for a range of situations from fraud, endangering activities, criminal offences and failure to comply with legal obligations. As a Babcock employee I have understood and acted in accordance with the anti-bribery and corruption policy. The guidance has allowed me to ensure that I act responsibility and ethically by outlining rules which help employees to prevent direct and indirect involvement in bribery or corruption.  My ethical responsibilities as an engineering professional involves my duty to have an awareness of how my work, actions and words affect others. I am aware of how whatever I do, and wherever I may be, I must not only act responsible for my actions as they influence the company’s reputation, but I must anticipate how my actions and words would be perceived in the wider world. It is vital to take the due diligence, as advised by the documents provided by Babcock, to assess the situation and tailor the approach accordingly. It is important that I remain in ‘whistle blowing’ for a range of situations from fraud, endangering activities, criminal offences and failure to comply with legal obligations.  It is my professional duty to ensure the safety of myself and others by operating only within the bounds of the laws and regulations applicable to the work being carried out. In addition to this, I must respect the environment and seek to minimise negative effects on the public and the environment, even when such considerations could present challenges to the ongoing project.  I acknowledge my obligation to obtain the necessary knowledge and understanding to carry out a task, and to be honest when I do not have the required skills to carry out a job safely. I can identify and evaluate risks within the work scope by producing risk assessments to manage impacts and mitigate the likely hood of the events occurring. This involves but is not limited to challenging others or policies when concerns arise. It is important that I remain honest, while respecting confidentiality to ensure the safety of myself and others. This involves respecting and protecting personal information and intellectual property. |