

LEVEL 4 ASSESSMENT SPECIFICATION

Student name:	Ieuan Morgan Davies	Student ID number:	147387
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Lecturer:	M. Lewis	Internal Verifier:	L. Rutherford
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Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Disclosure:	I declare that this assignment is all my own work and that I have acknowledged all materials used from the published or unpublished works of other people. All references have been duly cited.		
Student's Signature:	Hardcopy assignments will not be accepted without a signature here		Date:

Module Learning Outcomes (from module syllabus)
LO1 LO2

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Good.

Task 1

For task one you are required to demonstrate a knowledge and understanding of the **operational and maintenance activities** within a process engineering environment of your choice. You should include operational and maintenance principles of key process equipment such as:

- Pumps,
- Compressors,
- Turbines,
- Heat Exchangers,
- Fired Heaters,
- Columns,
- Reactors,
- Tanks and Vessels,
- Valves and Piping,
- Motors -

third party in a report normally

Task 1

For task 1 I have chosen to look at the flare drum, both sweet and sour, and how they operate with the flare header and also the flares.

Flare drum

The operation of the flare drum is to allow gasses to travel up the flare and to recover any liquid back into the flare knock out pot. Gases are burnt using a flare as they are toxic and not wanted due to having no need for them.

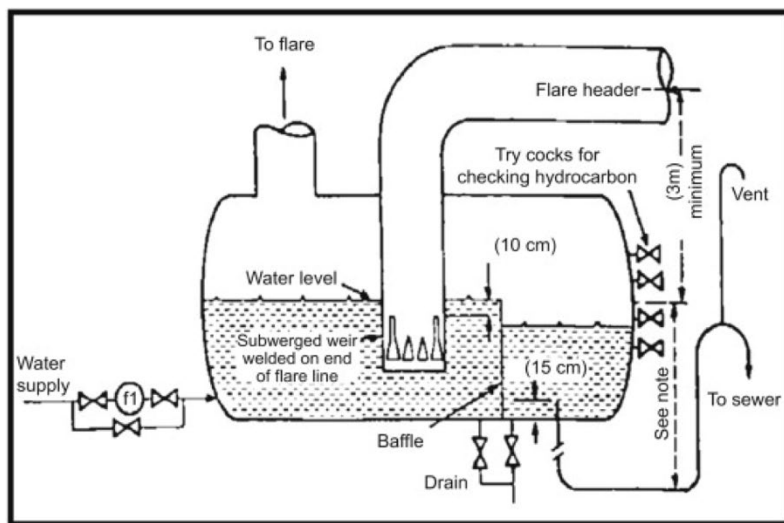


Figure 1 - Flare drum

Figure 1 - (Alireza Bahadori, 2014)

The design of the drum is simple, it has two sides one called the boot side and the other called the eater side, these are separated by a weir plate. The water level should have a constant level of water, this will be kept using the weir plate to hold a maximum Level and also a minimum level controlled by the water flow valve. When the water flow valve opens it will allow water to be pumped into the drum. The boot side is normally empty, it will fill up when any liquid overflows from the water side. Due to water having different densities, the oil will float on top of the water due to it being lighter and therefore, it will flow over the weir first. Once a level has been established in the boot side, it will be pumped away.

(K.Lloyd, 2018)

The flare header will be the inlet to the flare drum, all the gasses/liquids will be sent down from the units and will end up in the flare header and will make its way to the flare drum. The inlet will then come into the drum and be submerged in the water. This is a safety feature of the drum. The feature is to allow any gasses to pass through the flare drum and allow them to flow up the flare, however, not letting any gasses travel in the opposite direction. This is due to the water level in the drum. The gas push through the water then having pressure from the units, however it will not pass backwards. (K.Lloyd, 2014)

Another feature of the flare header is that it has a 40 lbs steam Line going into it, this will ensure that the line is kept to a minimum temperature. This is due to the liquid and gasses having different evaporation temperatures, some products can freeze the line, for example propane is an extremely cold product and can cause freezing of the lines.

Instrumentation control

furthermore, the flare drum has a large amount of instrumentation which can control and monitor the condition of the flare drum, the instrumentation will monitor all aspects such as level, flow, temperature and pressure, and will act accordingly to that in either a cascade loop or manual depending on what the control operator has set.

(K.Lloyd, 2014)

Due to the flare system being such a critical piece of equipment, there will be regular maintenance checks, such as instrument pm checks on the equipment, mechanical checks in the equipment and operational checks and inspections on all of the equipment.

The roll of the operator is to inspect the equipment on regular intervals during the shift, ensuring the equipment is running correctly, there is no leaks, no equipment is damaged and the equipment is running as it should. The control operator can request the field operator to check the local level of the drum, this can be boot side and water side., this is to compare both level readings and ensure there is no fault with the instrumentation. If there was difference between the readings, the instrument department would have to check over the equipment and recalibrate the

instrumentation. Furthermore, the control operator can request that the turbines that pump out the boot side be started in the field, this can be because of instrumentation malfunctioning or not starting the turbine as per the auto cut in.

(K.Lloyd, 2014)

Mechanical maintenance

When the mechanical department is assigned work on the flare system, they will typically be looking at the steam turbine which pump out the boot side of the flare drum. This is a regular job which occurs every 6 month^{See}, it is done on regular intervals to check the equipment is functioning as it should. This is due to the high importance of the equipment. When the mechanical department is given the job, it will be to visually inspect the turbine and associated equipment to ensure all equipment meets the correct standard. For example, the condition of the guards to ensure they have not rusted away. Next, they will start by taking the coupling out, this is the part that connects the shaft of the turbine to the shaft of the pump. taking this out will allow the operator to start the turbine without effecting the pump. Next the mechanical technician will complete an oil change on the turbine and associated parts. This is done on a regular interval to ensure the oil can do the job required. The oil is used to lubricate the required parts, to stop excess amounts of friction, as this can lead to excessive wear and heat. This can cause major damage to the associated parts if not maintained correctly. Additionally, it is important the turbine is topped up regally[?] with oil when the operator does the routine checks during the shift. Next, the technician will ensure all parts meet the site standard. For example, the distance between the shaft of the turbine and the outer casing will be measured to ensuring the distance is not too small, too large. Next, the technician will put all the reassemble the turbine back to normal working condition, however, leaving the turbine decoupled, this allows the operator to start the turbine and perform a trip check. A trip check is where the mechanical technician will check the running speed of the turbine and also the trip speed of the turbine. The run speed and trip speed will be measured in revolutions per minute (RPM) this can be adjusted by the technician if the turbine is not running correctly. Once the trip checks are complete the technician will connect the coupling back to the shaft of the turbine and the shaft of the pump, this will complete the planned maintenance.

Do you
do this

Instrumentation Maintenance

Furthermore, the instrument department will have planned maintenance checks to complete on the instrumentation associated with the flare drum. The maintenance will be to ensure the instrumentation is working as it was designed to operate. For example, they will check the level gauge is reading correctly, and showing a true representative of what is in the drum. The level sensor will be in a separate vessel to the flare drum which can be isolated. The technician will isolate then empty the vessel. From there the technician will fill the vessel to specific levels and check the control operator sees the same level on the control panel, if all is correct no adjustments needed. However, if the level does not compare correctly then the sensor will need to be recalibrated.

Shutdown Maintenance

Moreover, the flare system will be completely isolated during shutdown period. This is due to the flare system being in service at all times, and therefore the only time there will be a low flow rate through the flare system is when the units are also shut down for maintenance. For that reason the flares will have a 'jump over' valve, this will allow the two flare headers to be connected. To allow all the flow through one flare drum and allow the other drum to be isolated. This will allow critical maintenance to take place, that would not be able to happen during normal operating conditions. For example, any instrumentation which can not be isolated from the flare system will be able to be worked on, ensuring it is calibrated and working correctly. This is because the flare drum and associated equipment will only come offline on average every four or five years, and therefore, all essential work which can not take place during normal operating conditions.

Furthermore, the flare drum will be emptied of all gasses and substances from inside the drum. This will be done by steaming out the drum, this will be done by having a flow of steam and heat through the drum, this will help remove any harmful substances which might be trapped within the drum. Next, there the drum will be opened to atmosphere to allow the drum to de-pressure and vent out to atmosphere, allowing the drum to be filled with air. This will allow entry into the flare drum with correct gas testing and permit issue.

Do you do any of the above tests?
Conclusion

Task 2

For task to you are required to demonstrate a knowledge and understanding of the levels of **responsibility** within the process industry. You should provide include and provide evidence of the following:

- CV, current job description and person specification.
- Your current development action plan.
- Evidence to prove your technical competence (your competence framework and how this has been met, copies of company appraisals or any assessments, copies of key certificates and training records, samples of relevant work undertaken, plans and evidence of work preparation, evaluation of work outcomes and personal effectiveness).
- Recognition of the results of your work and your achievements.
- Evidence of application of knowledge and skills as well as your **responsibilities and autonomy** when carrying out key work activities.

Task 2

CV

For the following task, please see Appendix A which refers to my CV, which also has a summery of work experience In the industry, with detailed personal traits which enable me to have a good work ethic and work effectively, in the given environment.

Development plan

Furthermore, after holding down the role as Tank farm Technician (TFT) I am currently training a second position training on the waste water treatment plant (WWTP), this will be to learn all parts of the plant, all routine duties and all procedures. Furthermore, I will have to learn gas testing procedures and the used of RAP to allow use of permits. Once passed out, I will be running the WWTP on a regular basis.

Any development plans, certificates etc

Certificates

As part of the evidence to prove technical competence, please see attached certificate of completion of basic operator training (BOT) in appendix B and also completion of the apprenticeship framework.

On Site Training

Due to being an employee on site, we are given safety talks, and Computer based training (CBT). These will highlight and talk about possible safety issue or previous safety issues. The reason to talk about previous issues is to develop the knowledge of that happened, learn from them and ensure they do not happen again in the future. Once the information has been read an exam / test will be given to ensure the employee knows the correct information. These are assigned on regular basis, typical four per month.

Responsibilities at work

When carrying out all work activities an Lost Prevention Self Assessment (LPSA) should be carried out to ensure you have thought about the task before starting and all risks have been thought of, and control measures have been put in place to ensure the risk has been lowered. For example, looking at hand safety when carrying out a task, a way of controlling this, is to use the correct gloves to ensure grip tools when carrying out the task, they are cut resistant gloves, and impact resistant gloves to protect your hand if hit against an object. Furthermore, as a worker at Pembroke, every employee has the 'stop work authority' this allows any worker to stop a job they think is unsafe, from there the works supervisor will need to be informed and this will be investigated.

Bibliography

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K.Lloyd, 2018. Plant and Process knowledge WWTP. Volume 5, pp. 47-60.

Any more references used.

Appendix A

Ieuan Morgan Davies
18 Gray Avenue
Manorbier, Tenby
Pembrokeshire, SA70 7TR

Home - (01834) 871496

Mobile - 07830 530334

D.O.B. - 22/11/2000 (Age: 19)

Personal Statement

My time on shift has allowed me to develop and mature into a valued member of the shift team. I have worked hard to gain the trust and respect of my colleagues. My common sense and safety conscious approach to work, twinned with my proactive engagement with LPS has ensured my time here has remained incident and injury free.

I am practically minded and thrive when problem solving and working out the best way to overcome problems or obstacles. I am always looking to learn new skills and put them to use.

As a team player, I thrive off helping others to achieve their goals, while not losing sight of my own. I enjoy both the camaraderie and company of my colleagues both in and out of work. I'm not afraid to ask for help, and feel I am adaptable and flexible to new situations and surroundings.

I am actively involved in volunteering my time at home as my Brother, who is 27, lost his eyesight 6 years ago. I help him to live as normal a life as possible. This ranges from helping him in and around the house, to aiding him when out in public. I will also make suggestions and offer advice to him when needed, as I have his full support.

I look forward to progressing into new roles within the company and will continue to apply the high level of dedication and professionalism I have shown to any position that I advance in to.

Work Experience

- Jan 2020 until present – Tank Farm Technician (TFT)
- Carry out sampling of white oil, black oil and LPG as directed by the panel and chair control operators, Refinery Operating Programme and Daily Operating Instructions.

- Carry out monthly and weekly dips as per the tank gauge sheet and DOI, ensuring results are recorded correctly and addressing any tanks that are not within SOX compliance.
- Complete handheld device checks which include, Tank PMs, Caustic dips and Low point drain checks.
- Carry out Crude Feed Tank water drawing and sampling to ensure feed tanks are dry and ON TEST before going on feed to the Crude Unit.
- Offering additional shift support with level 1 maintenance, TSV audits, Housekeeping and any other assistance that may be required.
- 2017 – Present
- Valero Refinery, Pembroke, Pembrokeshire
 - Represented Valero and Pembrokeshire College at Big Bang Fair (Wales) in 2018
 - Represented Valero and Pembrokeshire College at Big Bang Fair (Birmingham) in 2019
- 2015 – 2016
- Hope & Anchor, Tenby, Pembrokeshire - Waiting Staff

Further Education Achievements

- HNC in process operations engineering - Awaiting confirmed results for the first year
- Level 3 apprenticeship in engineering manufacturing
- Level 3 NVQ extended diploma in engineering maintenance (electrical)
- Operations & Maintenance extended Diploma
- BTEC Level 3 – Grade Distinction*
- Level 2 General Engineering City & Guilds 2850 — Course Merit
- Level 2 diploma in engineering maintenance technology

Essential Skills

- WJEC Level 2 Essential Application of Number Skills

- WJEC Level 2 Essential Digital Literacy Skills
- WJEC Level 2 Essential Communication Skills

Education

2016 – Present

- Pembrokehire College, Havefordwest, Pembrokehire

2012 – 2016

- Ysgol Greenhill Comprehensive School, Tenby, Pembrokehire
- 12 GCSE's A*- C including Mathematics, English and Science

Other Achievements

- Duke of Edinburgh's Award – Bronze
- Scouting Bronze, Silver and Gold Awards
 - 4th Pembroke, Lamphey
 - Attended Beavers, Cubs and then Scouts from 2007 – 2015
 - Scouting Young Leader 2015 - 2016
- Tenby Swifts (Tenby RFC) from 2013 – 2019
- Rugby training weekly and play every weekend
- RYA Sailing Awards. These include completing the RYA 1 & 2 Courses.
- Full UK driving license with no points

Skills

- Excellent Communication Skills
- Excellent Team Player
- Fully competent with Modern Technology and Software
- Able to follow instructions precisely
- Able to acquire new skills quickly
- Excellent hand/eye co-ordination
- Regularly attend the Gym to maintain peak fitness
- Punctual and Reliable at my place of work

