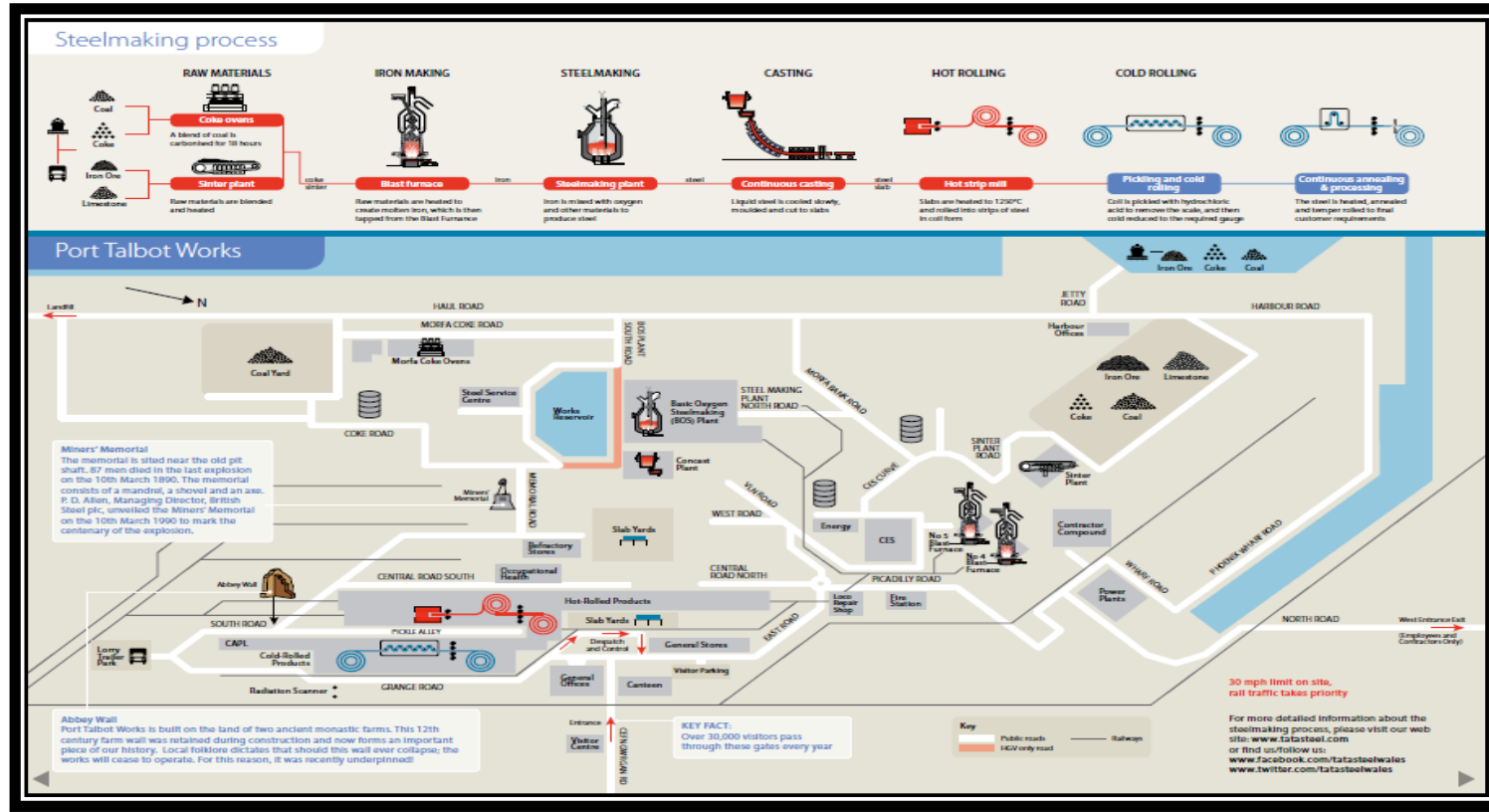


1. Introduction

Port Talbot Steel Works and its 3600 employees produce some 4.7 million tonnes of steel per annum, where about 3 million of it is rolled on site and the rest sent to Llanwern. The steel is produced, and coat finished on site and then delivered either direct to the customer or to other TATA sites where further production processes are implemented prior to customer issue.

The site is divided up into several departments and plant areas that carry out specialised processes that collectively produce strip steel. My project will be based at the Casting Department.

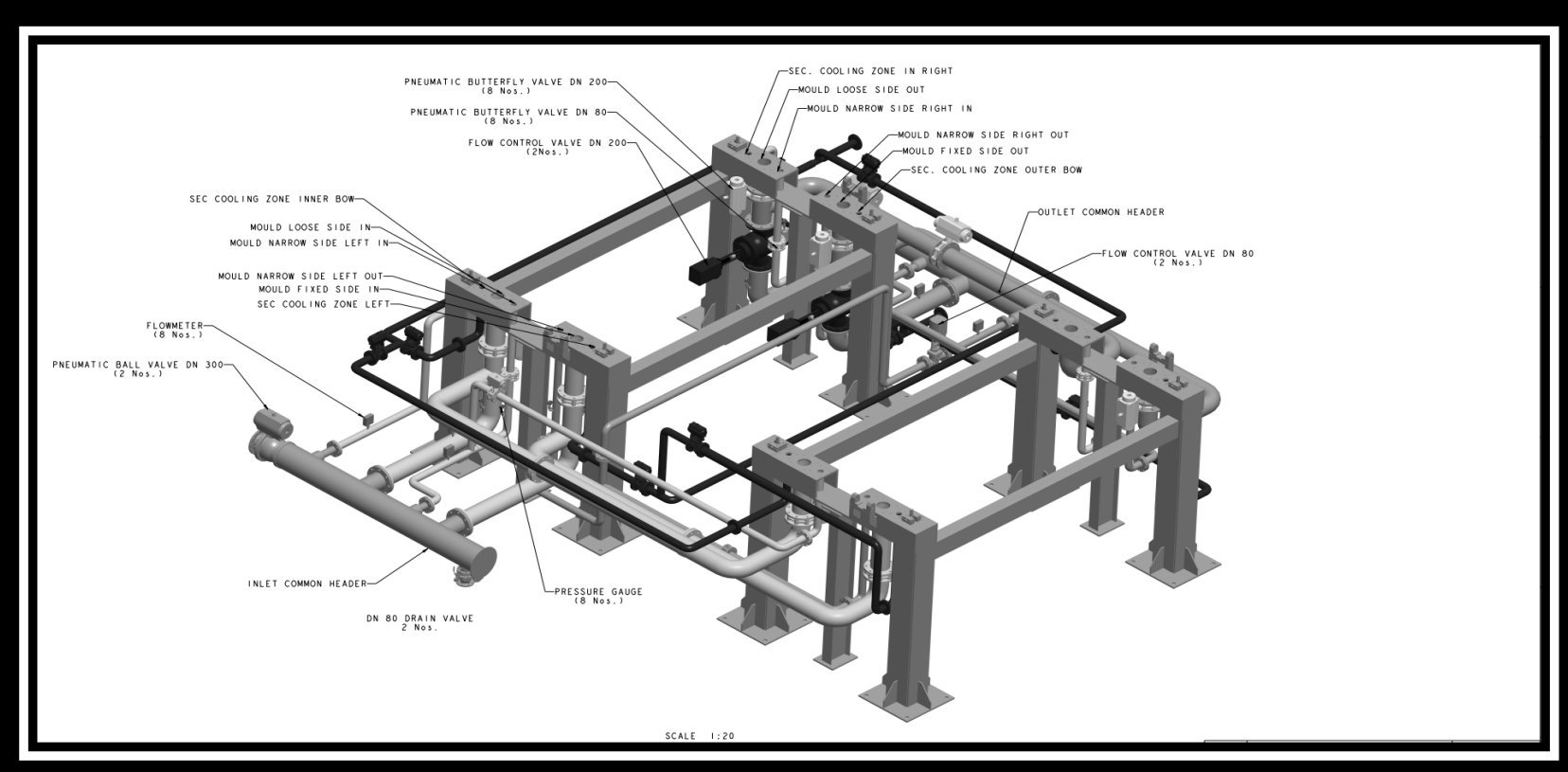
- Raw Materials
- Iron Making
- Steel Making
- Casting
- Hot Rolling
- Cold Rolling



2. Abstract

The Sole intention of the Project is to provide a comprehensive guide on the installation of the Caster 3 Process Bay Water test stand. The main purpose of the design is to do accurate pressure and Flow test of mould as required by the original scope of design. The Mould is design to Deliver Constant cooling flow to an original scope which was design on original design. The Mould Consist of Copper Plates which are water cooled these have to be cooled to a desired Flow rate to help solidify the Steel To form a slab. If the mould has too much Flow this can cause shrinkage to occur.

Mould water test stand consisting of pumps, valves and associated instrumentation for flow and pressure testing of mould. The system is designed for flow testing of either complete test stand or any particular face of the mould. Pressure testing-is envisaged to identify any leakages in the mould.



3. Aim, Objectives

The Main Purpose of the Project is to help drive reliability and performance within the casting process within Tata steel. We have had a lot of Instability around these moulds in past 24 months around end plate water leaks occurring whilst the mould is in operation in the Casters.

- These requirements are to design, construct, install and commission a new electrical and instrumentation package that will test the cooling capabilities of the caster 3 mould in preparation to be returned to service fit for purpose.
- The main objectives of the project are.
- To improve safety of these Moulds. – This failure can cause serious events such as loss of life. As water and molten steel can be like thermal explosion.
- To improve reliability – This will help us achieve our goal as an industry to make 4.7 million tonnes of steel.
- Cost Saving – This mould refurbishments can cost between 200 hundred thousand pounds each.
- To improve quality of steel – This mould cooling system can help us produce quality high grade steels if cooling jackets are operationally 100%.

4. Project Justification



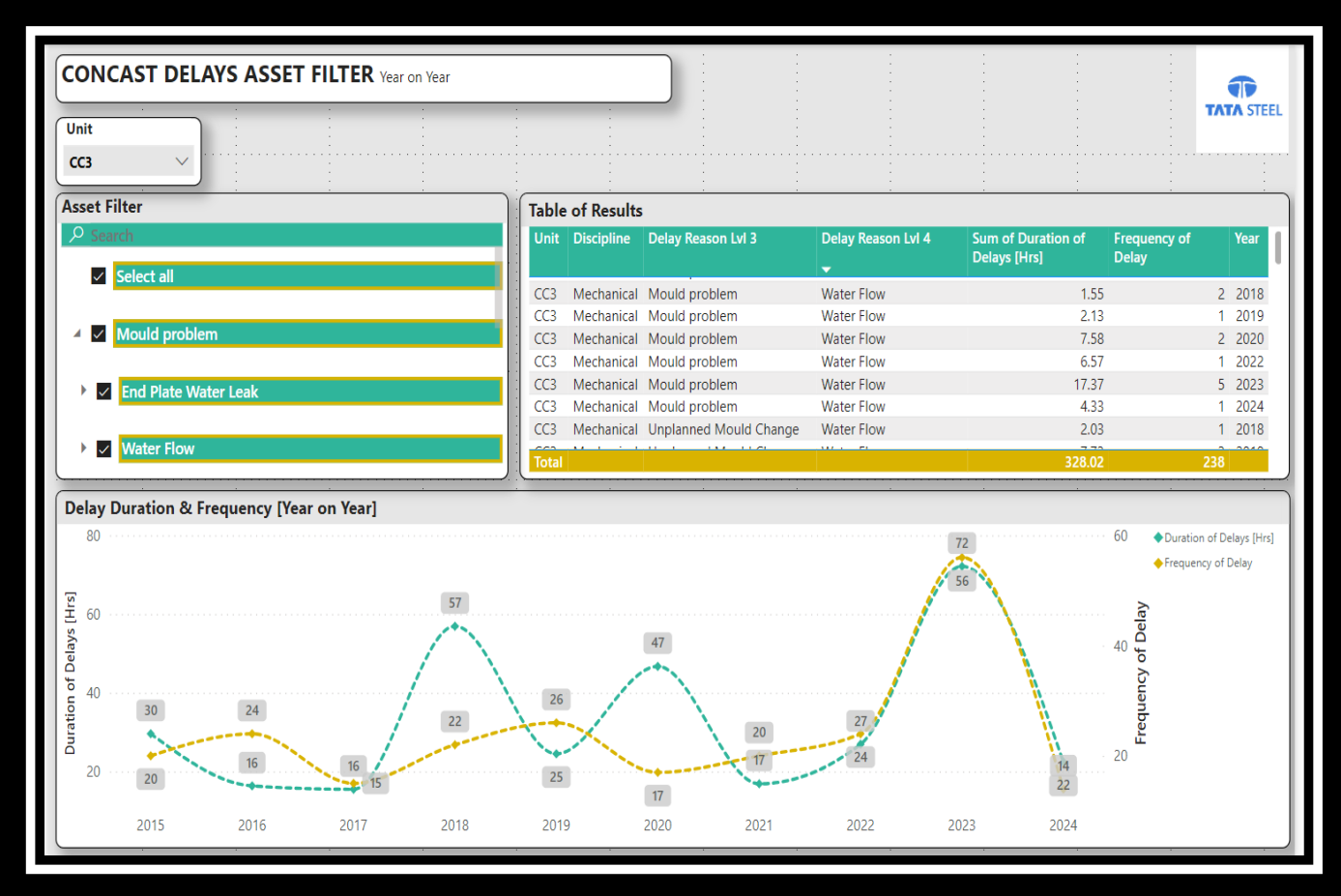
The Main reason for the Project is to help drive Safety .

This number 1 Non - Negotiable.

The Second reason is Quality, Cost – Effective , Tonnes.

As can see from the below graph the

Delays experienced High volume of Delays.



As can see from below Graph a The total amount of loss to capital to the business from these Delays/ Issues.



5 . Project Design

The project design will consist of designing a water test stand in process bay which is exact replica of the Casting process where the mould is situated during casting.

We require the water test stand to be exactly the same as the Casting stand as we need to make sure all condition is same under testing and commissioning of moulds.

The water plant will supply the necessary water to respective mould during its testing activity. The mould water testing system consists of the following:

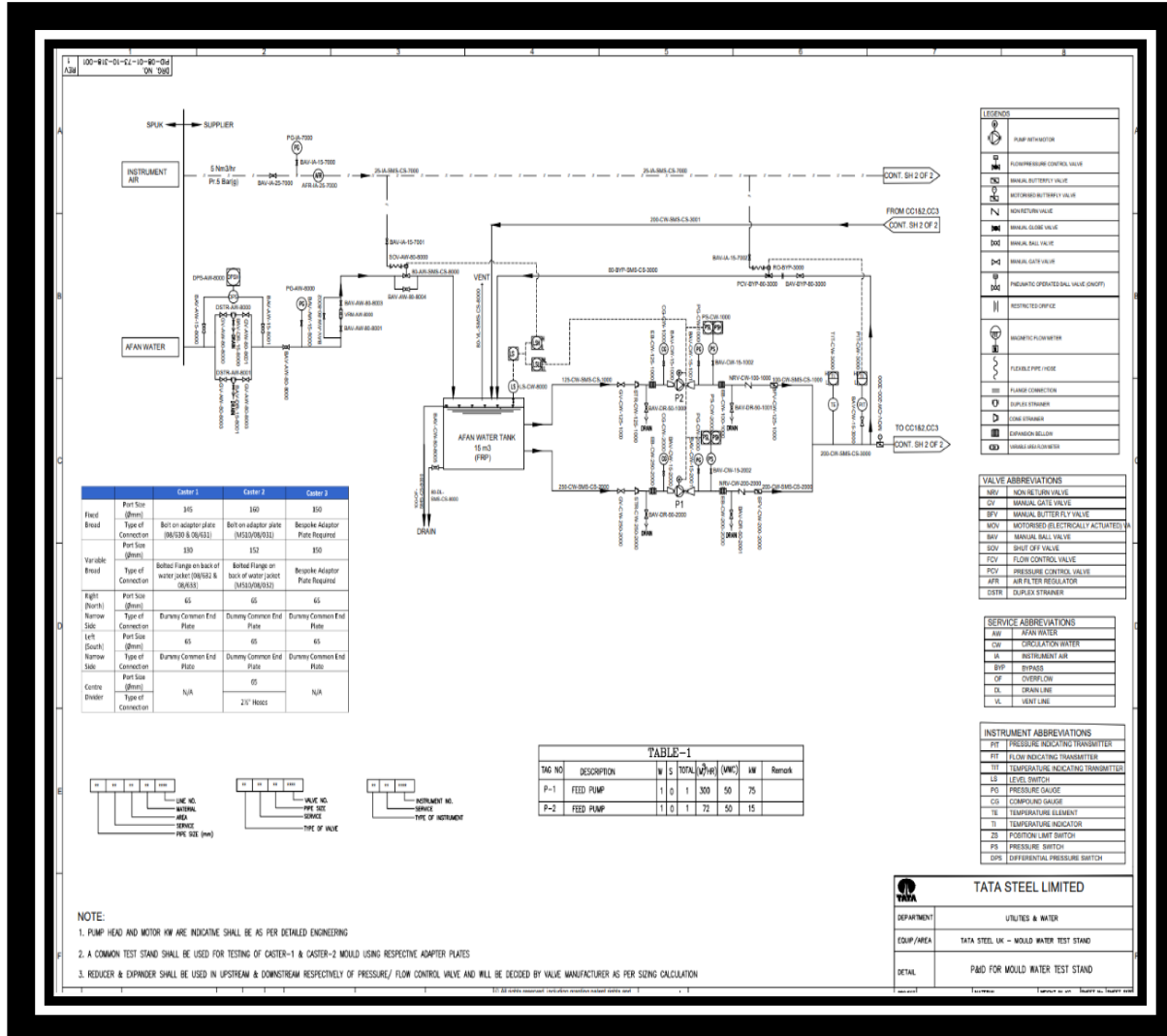
- Two Feed pump (P1 & P2) – Flow Test & Pressure Test
- One water storage tank

The system will be controlled by the new PLC located in the Caster 2 test Stand MCC.

- This water system is controlled via the local operator station (HMI). This will have functionality for start/stop of test, test selection modes and healthy/running indications for each motor unit etc.

The variable speed drives on the pumps will help achieve these goals and the automated valves will help deliver the sequencing required.

The project outline is shown in drawing below shows.



6. Project Implementation



7. Conclusion

If there was one thing to be taken from the project, it would be that within the industry worked, timescales are extremely difficult to accurately determine with ever-changing production schedules, economic climate, and prioritised work all being contributing factors. This, however, is the nature of the business at Port Talbot, where it is forever governed by both internal and external factors that will determine whether maintenance procedures, upgrades and new installations will go ahead.

With regards to the objectives set out at the start of the project, a much clearer understanding of the health and safety requirements was achieved and as a result, an informed decision was made on how the project was going to be achieved.

Extensive research went into the selection of components used in the Project such as instrumentation/Motor and pumps etc. A lot of the theory was collected from what is used on the continuous caster 3 as the test stand needed to be a direct replica of the machine to fully test these correctly.

All installation work was carried out efficiently and in a more than satisfactory manner. The only issues occurred was time constraints due to production requirements and Manning levels as in house labour was used to help save on the budget.

There are still a lot of work required to complete the project successfully when the company has made a decision on it future within the UK steel industry but ultimately the project has been a successful one up until this point even know completion was successful.

8 .Acknowledgments

Much gratitude is given to all of the engineers that aided in the process of this project from its design stage right through to its installation period. Hopefully in the future when a decision is made by the Tata Steel Directors in the path the UK steel industry will be taking the project can be completed to implementation period.

In particular, Mr D.Gibbs, Area Engineer, Mr C.Francis, Project Engineer, Mr B. Rees, PC&A Engineer and Mr N.Powell, PC/I Engineer all of whom gave great support throughout. Gratitude is also extended to all those who took part in organising the project and for those who participated in carrying out Installation of the project to date.