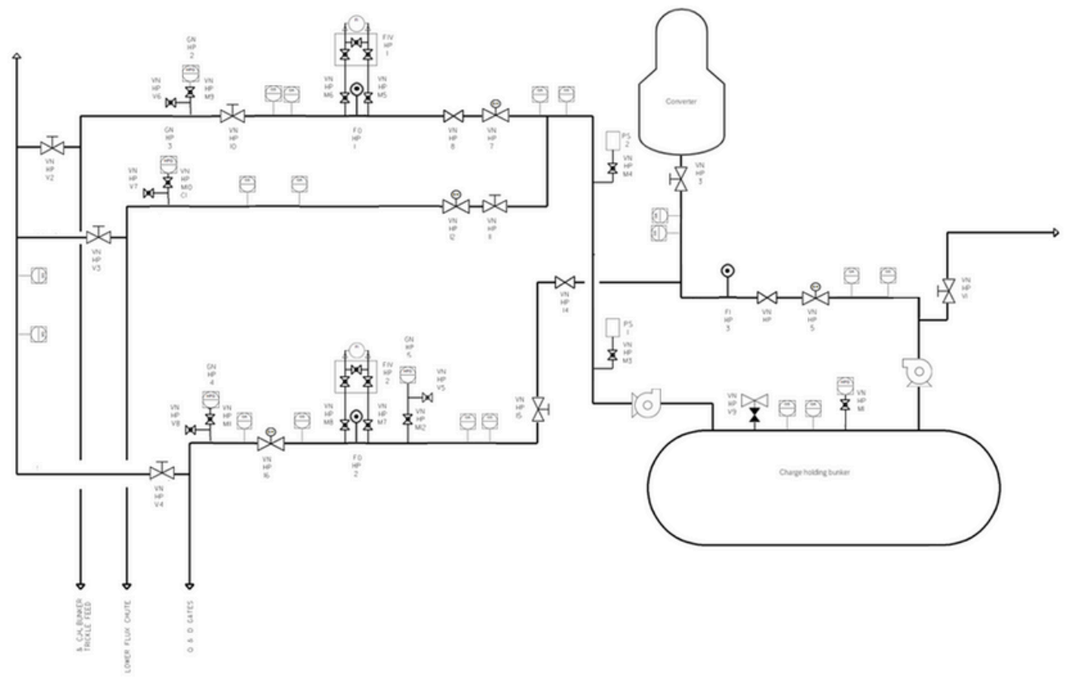
PIPE & INSTRUMENT DIAGRAMS - PLANT PERFORMANCE AND OPERATIONS.

P&ID on the Nitrogen system on the Basic Oxygen Converter (BOC) at TATA Steel.

WHAT ARE P&IDS?

Pipe and Instrument Diagrams (P&ID) are detailed drawings which have high accuracy representation of the process' system and equipment. These include components, including piping, pumps, gauges, valves, and various other components. These are useful when undertaking maintenance on plant as they illustrate exactly where a components location is or where a certain pipe is on plant. These are great for design as they provide detailed and in-depth information for the construction but also the best placement solutions.

MY P&ID:



AREA OF PLANT.

In order to make steel at TATA Steel, Port Talbot, the use of two Basic Oxygen Converters (BOC) are used. These converters convert iron from the blast furnaces into steel with the addition of scrap and alloys. Gases like oxygen, nitrogen, and argon are used to reduce the amount of carbon content in the steel by removing any impurities within the iron. The P&ID provided is the nitrogen system on the basic oxygen converter.

Image from: http://blog.steel-technology.com/basic-oxygen-furnace-steelmaking/

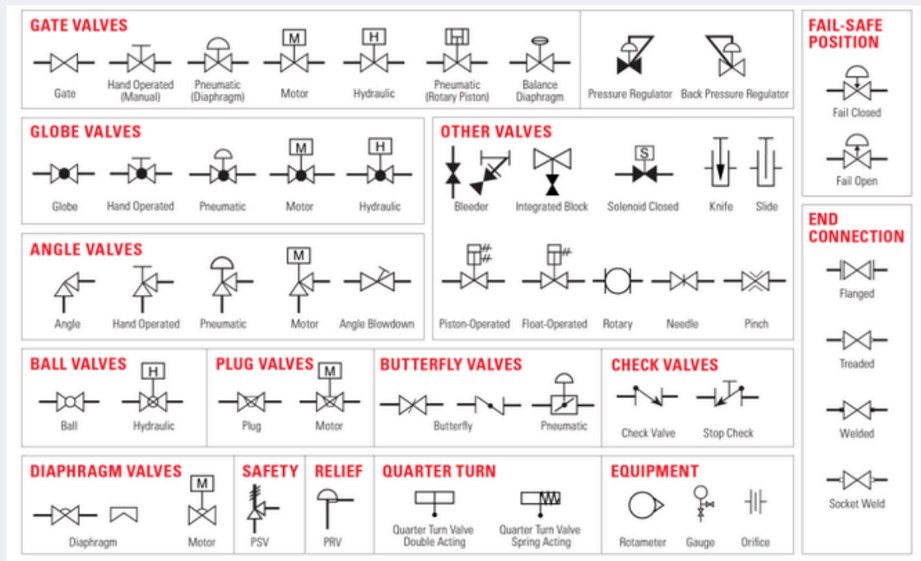


Image from: https://kimray.com/training/most-common-control-valve-symbols-pid

HEALTH AND SAFETY CONSIDERATIONS

Health and safety considerations for P&IDs are essential as this ensures the safe operation, maintenance of plant equipment, and design. Its essential that compliance to standards are met by adhering to industry regulations such as to ISO and OSHA. Its important to conduct hazard and risk assessments using POWRA to identify any risks or hazards within the system. Implementing gauges, sensors, alarms, and interlocks for continuous oversight and are required that these systems meet guidelines and safety codes for all equipment, instrumentation, and piping. As this system uses nitrogen its important that pressure relief valves are used in the system to avoid overpressure. When performing maintenance on the system the use of a P&ID should be used as this can identify isolation points, ensuring safe maintenance. In the case of an incident a P&ID again should be used as this can allow the personnel investigate and determine if deviations from the design contributed to the incident.

COSHH & COMAH

When working with hazardous substances it is important to consider COSHH & COMAH regulations(Control of Substances Hazardous to Health & Control of Major Accident Hazards). In this example, nitrogen is hazardous as it can cause asphyxiation, therefore it is crucial to apply these standards.