

presentation-carlo

by Carlo Coppola

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HNC Project 2022

By carlo coppola

Company background

The company I work for is TATA steel. A subsidiary company of the TATA brand that specialises in the production of steel. Trostre is part of the packaging plant that cold rolls and coats the steel, we are supplied by Port Talbot which is part of steel and slab and manufactures the steel coils we receive via trains.

The relevance this project has to my industry is to monitor and improve the reliability of process control equipment. The purpose of the project is to monitor the pressures of the Exit snip shears of ECCS 4. this is our chrome coating line, As its one of our main plating lines its important to keep it running and a good way to do that is to improve its reliability to prevent unplanned maintenances and breakdowns which harm company profits and prevents the company from fulfilling orders on time to our customers

Trostre mainly supplies HEINZ, Crown and ball corporation.

The problem we aim to solve

Currently we only have an outdated analogue system to monitor the pneumatic pressures used to operate the snip shears. These are behind guarding so they are unable to be checked when the line is running and we have no way to check how the shear pressure has been working historically.

As its unsafe to check because the line is running it makes it difficult to understand if there is a fault present or not, the fault may only be there when the shears are in operation but we cant tell as it is.

Objective

The objective of this project is to install a PLC to monitor pressure by displaying pressures on a HMI screen outside the guarding and continuously record data of the pressure using IBA Analyzer. Its safer and allows us to check the pressures with the shears running.

This data that is recorded can be looked back on in case of a fault to be able to fault find easier.

Analyse other potential solutions and evaluate which is the better solution for the application.

Functional specification

We are expanding a monitoring system by adding a remote I/O panel. We have selected IFM pressure sensors which will connect to the network via IFM I/O Master link.

The pressure sensors have been selected for their I/O link compatibility.

Network switches link our PLC to our remote I/O and we will use our PLC for scaling and programming our HMI.



Software specification

Siemens TIA portal – used for programming the PLC and will also be used to programme the HMI screen (insert version of Tia portal used)

IBA Analyzer – IBA will be used to record and display the signals from the pressure the IFM pressure transducers.

IBA will also be accessible for the line engineers remotely.

GSD File for IFM I\O Link – allows access to IFM components inside the Siemen software when programming networks. This is provided by the device manufacturer.

Hardware specification

Siemens 24V PSU - SITOP PSU100S, 6EP1333-2BA20 (Part no.), £131.00

IFM I\O Link Master, 8 port – AL1102 (Part no.), £347.71

Siemens Network switch – siemens XB005 Rail mount 10/100Mbps/s, £101.07

HMI screen – KTP1200 basic 12” touch screen, 6AV21232MA030AX0, £1829.00

IFM Pressure transducer - TBD

Solution 1 – The PLC method.

This method involves using a PLC which will be used to programme the HMI and will also link to IBA so we can get a record of the data. This is the more expensive option of the 2 methods but it follows site standard when it comes to using the Siemen software and allows us to record the data into IBA.

We will be using network switches to link our PLC to I/O links, connecting profinet cables alongside power supply cables to the panels.

Solution 2 – No PLC method

This method ignores the involvement of a PLC and relies solely on installing IFM sensors and IFM displays.

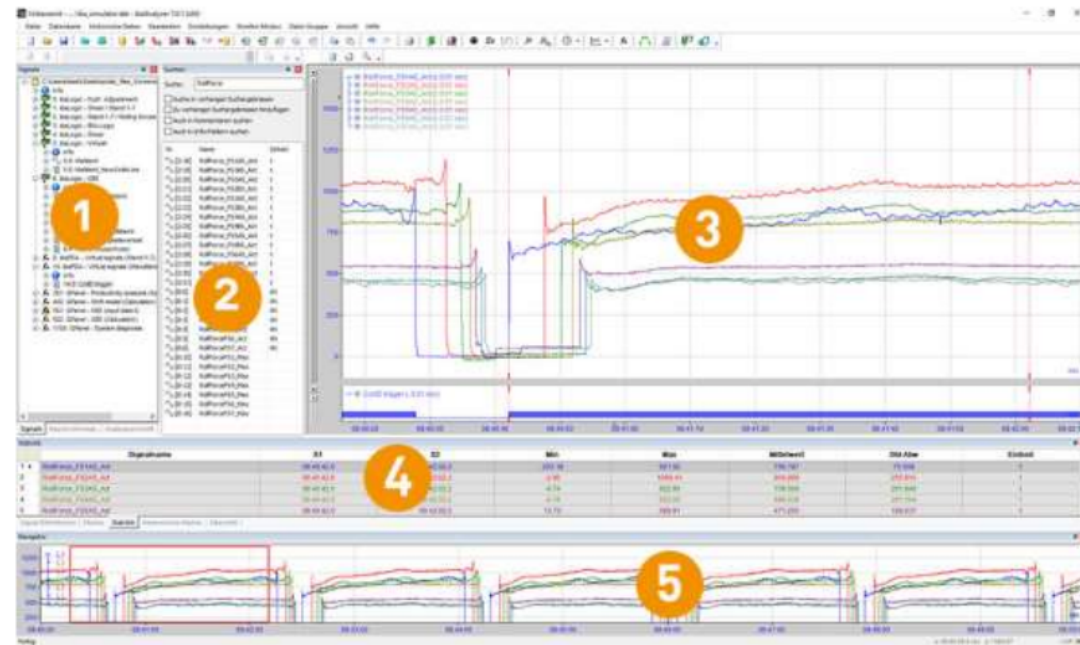
Because there's no PLC we are unable to have the HMI we want as we will need a PLC for it and we will not be able to involve IBA analyser like we want too.

The IBA analyser is to keep that record of data that we want.

Solution 1 or 2?

Both solutions have their pros and cons but site standards that have been recently set to upgrading our PLC's system to siemens. Favour the installation of the PLC. We are also able to monitor it with IBA.

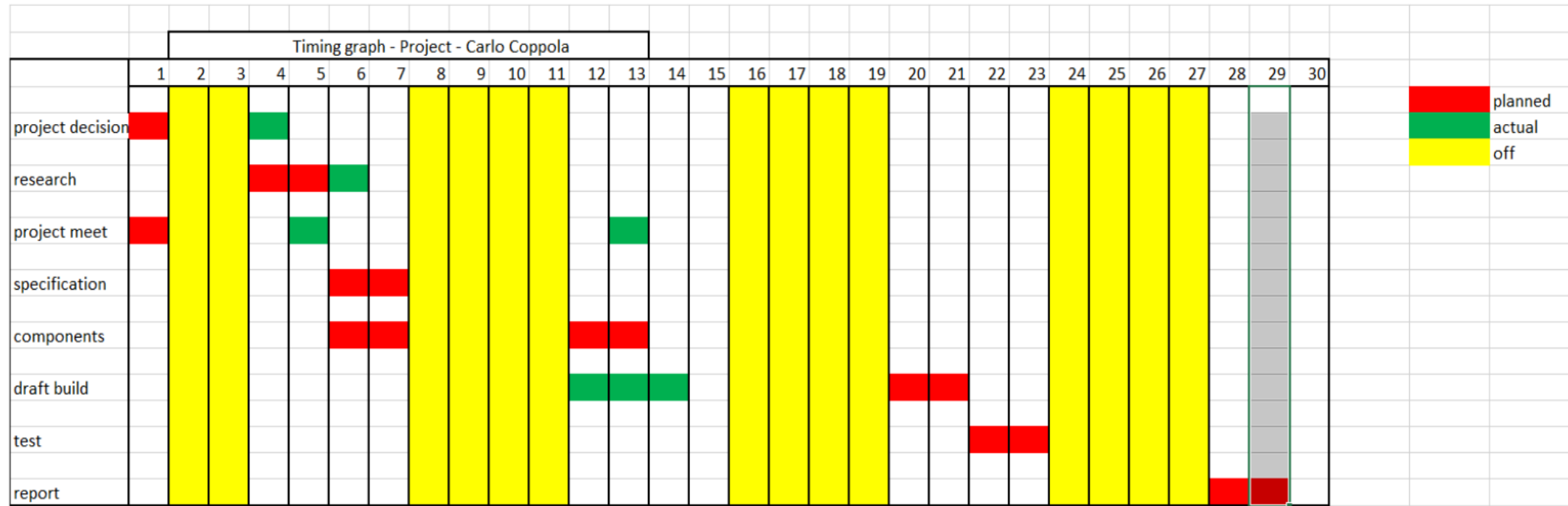
If we were to use the IFM method then
We would have a completely separated
Monitoring system from the main
Network (PLC network)



Chosen option

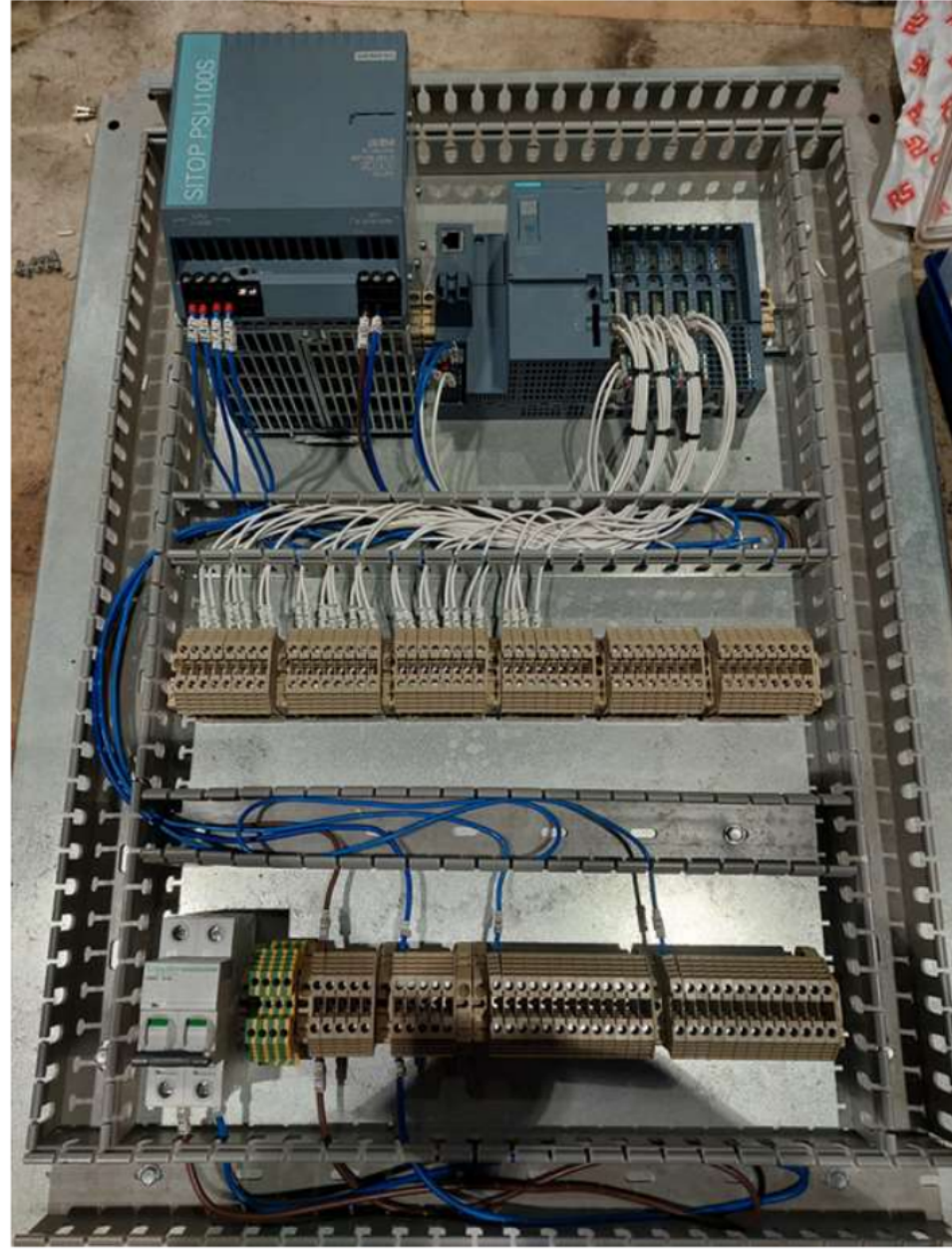
Solution 1 PLC method suits the application and conforms with site standards. The engineer had also informed he would personally like the system to be integrated with the new run of network for the main PLC network on line 4. Siemens is a familiar software to use so installation will be simpler and less technically challenging.

Time plan



Current progress





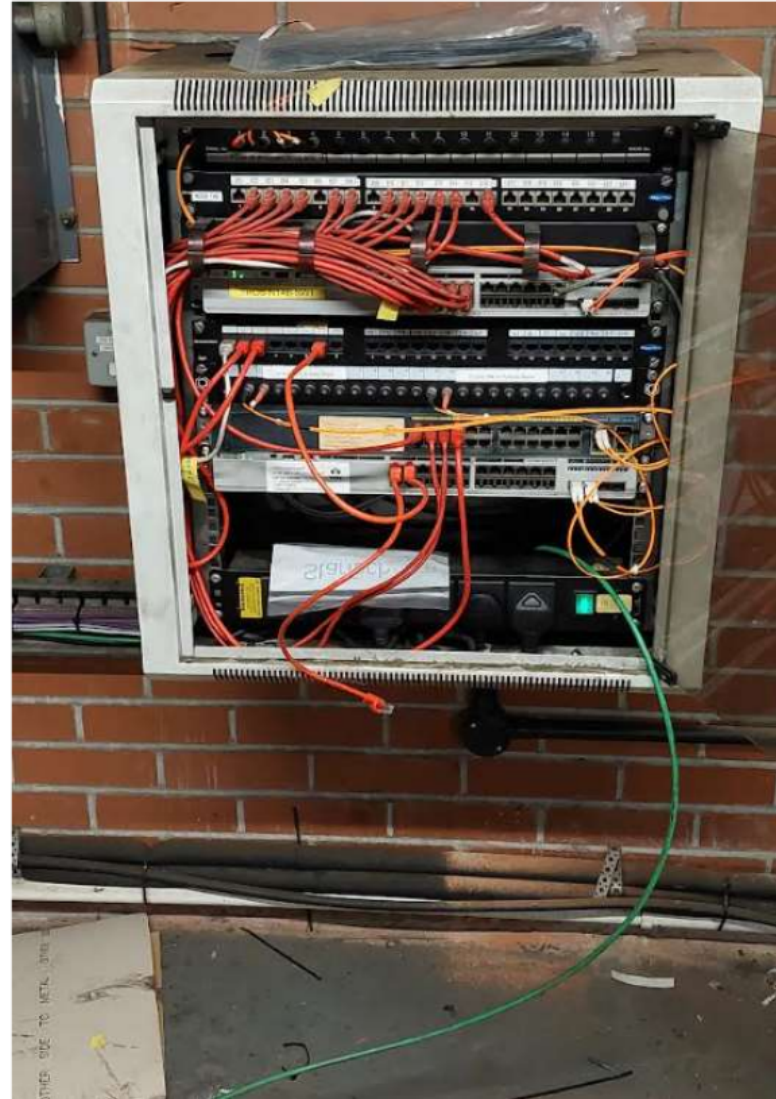
The work area and whats installed. (extra)

This is the installed
panel on the exit of the
line that will hold the
Panel design im
working on



This is the main network panel that is located underneath the operators pull-pit

Originally the ethernet cable was layed out with the intent of an independent system, we re-ran the cable to join it to the main network in this image.



Thank you for listening.

Any questions?

FINAL GRADE

GENERAL COMMENTS

Instructor

61 /100

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GRADING FORM: CSG-RUBIC

CARLO COPPOLA

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RESEARCH-INFORMED LITERATURE



Backgraound research has been carried out and is relevant to project. 6/10

Research for solutions has been explained and includes a good level of detail. This indicated and a good level of reading around the subject area.6/10

12/20

KNOWLEDGE AND UNDERSTANDING

 Problem definition was explained with a reasonable level of detail with application from industry. 3/5
Constraints and codes of practice were identified with software licencing, standards and intellectual properties relevant to the industry. 3/5
Environmental issues have been included in the form of software replacing hardware, and sustainable program structure. 3/5
Functional design was explained with a block diagram. No test plan. 2.5/5
Response to questioning was adequate and demonstrated an understanding of the project and the problem. 6.5/10

18/30

ANALYSIS

 Problem definition has been identified with an understanding of the objective and procedures needed. 3/5
Functional design was understood and the specification was explained from the block diagram,. 6/10
Final solution justified and explained with environmental and sustainability issues used in the justification. 3/5

12/20

PRACTICAL APPLICATION AND DEP.

 Design spec was explained in detail with relevant components identified. 3/5
Critical choice has been justified through evaluation and showed an understanding of PLC's. 7/10
Project plan with breakdown of activities was included and explained with management methods. 3/5

13/20

SKILLS FOR PROFESSIONAL PRAC.



Slides included good relevant content. 3/5

Delivery of content demonstrated a good understanding of the project. 3/5

6/10