

SGEL6000 Independent Project

DOUBLE MARKING SHEET AND COMBINED STUDENT FEEDBACK

Assessment 4 of 4

Presentation 2: Project Design, Implementation and Evaluation

2020-2021

Agreed mark

55

Link to Presentation: <https://youtu.be/u9SgOOqNIg8>

Link to Questions: https://youtu.be/g_peQp7klBw

Student Name: **Phillip Rowe**

Student Number **1602827**

Generic Assessment Criteria	Marks available	1st Marker (RD)	2nd Marker (MH)	Agreed Mark
1. Engagement with Literature Skills.				
Section 3: Use of technical literature in final design solution: There is good evidence of use of technical literature in the design and referencing to standards A good range of sources, but limited references to wider issues.	5	3	3	3
Total	5	3	3	3
2. Knowledge and Understanding Skills				
Section 1: Introduction: Aims and objectives clear set out. Project was introduced as a weld monitoring system, aims and objectives were listed.	5	3	3	3
Section 2: FDS: The original FDS was briefly review and additions pointed out. FDS was revisited, slides didn't show any of the actual requirements, instead various testing requirements were explained verbally such as tension test and pressure transducers. A change to the FDS involving a temperature probe was also justified.	5	3	3	3
Section 3: Advanced knowledge and critical understanding demonstrated in the design of the project: There was some evidence of knowledge and critical understanding though some points were overlooked or not considered. Perhaps there has been too much reliance upon industrial supervisor support. Knowledge of the project was good and there was some evidence of critical understanding, however it wasn't the most technically demanding project.	10	5	6	5
All sections: Response to questioning: Good honest answers. All questions were answered with some degree of knowledge and confidence.	10	6	6	6
Total	30	17	18	17
3. Cognitive and Intellectual Skills				
Section 5: Testing and analysis of result:	10	4	6	5

Some references made to testing, some presentation of results. Trend graphs could have been presented showing the performance of the system. Testing was described mainly as dead testing of continuity and tightness. Live testing was also described and problems explained.				
Section 6: Critical evaluation of the project outcomes and comparison with the FDS: Good evaluation of the FDS and project outcomes FDS was briefly evaluated, welds can now be monitored as required. Should have been more specific references to the FDS.	10	6	5	5
Section 8: Overall conclusions and recommendations: Very good overall conclusions but recommendations were unclear Recommendations were vague such as adding more transducers, without really stating why.	10	6	5	6
Total	30	16	16	16
4. Practical Application Skills				
Section 3: Formulation of innovative and creative design solution to the project problem: The solutions is innovative, creative and appropriate for the industry. The solution is valid and satisfied the FDS.	5	3	4	3
Section 4: Deployment method, use of material, tools, equipment and techniques in the construction of the project: Good use of tools and equipment in the construction and installation of the project. The project comprised a remote IO rack, 2 pressure transducer and a screen, wasn't clear from the presentation how these were constructed.	5	4	2	3
Section 4: Quality of the final product or system: Excellent build quality. However, the SCADA screens could have shown larger trend graphs with alarm levels and early warning indicators showing the direction of the current rather than waiting for it to drop below an acceptable level. The system works and has been employed by the factory.	5	3	4	3
Section 5: Use of test equipment and presentation of results of the project: Little evidence presented of calibration using test equipment. Over reliance on the company to do the calibration periodically. There should have been proof presented showing that the readings were valid. Functional testing was explained covering the dead testing and functional testing aspects	5	2	3	3
Section 7: Management techniques and planning, comparison with initial plan: Good management techniques and planning Gantt chart was shown as well as a budget spreadsheet.	5	3	3	3
Total	25	15	16	15
5. Transferable Skills for Life and Professional Practice				
All sections: Quality of the presentation slides: Generally good but tables should have been checked before running the presentation as the text had been set to white on a white background. Many of the slides had white ink on a white background so were not visible. Other slides lacked detail e.g. FDS was a list of questions rather than answers. Photographs of the project were crammed onto 1 slide and covered the panel, the transducers and the testing screen.	5	1	1	1

All sections: Quality of the delivery style: Good style, confident manner. Slides and explanation lacked detail and clarity at times.	5	3	3	3
Total	10	4	4	4
Grand Total	100	54	57	55

presentation 2

by Phillip Rowe

FILE	7557_PHILLIP_ROWЕ_PRESENTATION_2_179209_376395577.PPTX (653.06K)		
TIME SUBMITTED	27-MAY-2021 09:46AM (UTC+0100)	WORD COUNT	855
SUBMISSION ID	155042005	CHARACTER COUNT	4227

Welder monitoring system

By Phillip Rowe

1. Aims and Objectives of project

- Weld monitoring system
- Real time data monitoring
- Prevent major delays
- Aid fault finding
- Data accessible via works network

2. FDS

- What was contained in the FDS?
- Was the FDS met?
- Any changes to the FDS>

3.Design requirements to meet FDS

Item name	Quantity	Reason chosen
S7 1516F CPU	1	Fast processing speed, room for massive expansion for future demand.
S71500 PSU	1	Power supply unit which is required for the 1500 series PLCs.
S71500 Rail	50cm	Special rail used in order to mount the 1500 series devices.
Profinet connectors	4	Used to terminate profinet ends for network communications.
Module interface IM155-5	1	Remote node used for the 1500 series with a range of expandable input cards can be used with a higher current/voltage rating.
Siemens 20A PSU	1	Capacity for large number of devices to be used under this power supply.
AI input module	1	This card offers U/I and RTD capabilities. Type of input is changed by wiring and altering software.
AHR 500 B10 current transducer	1	This current transducer is fixed and will also measure within the current range needed of 0-2000A. It also offers 0-10v output.
IFM PN2571 pressure transducer	2	This pressure transducer offers the correct operating range, as well as the correct analogue signal of 0-10v output.
Calex CIRSPMHA201CT CRTMSD temperature probe	1	This will monitor the temperature of the strip and provide the correct output signal of 4-20ma.

4. Construction



5. Testing, results, maintenance and reliability

	Test type	Test method	Expected result	Actual result	Pass/Fail	Amendment requirements
1	Continuity test of power +/- connections.	Continuity test	0.1 ohms	1.1ohms	PASS	N/A
2	Continuity test of remote I/O device supplies.	Continuity test	0.1 ohms	0.1ohms	PASS	N/A
3	Continuity test of AI connections	Continuity test	0.1 ohms	0.1 ohms	PASS	N/A
4	Tightness test of all connections	Terminal screwdriver	2.5nm torque setting	2.5nm	PASS	N/A
5	Security of all transducers	Physical touch	Secure by hand	Secure	PASS	N/A
6	Visual inspection of present earth/containment protection (BS EN 50110 and BS EN 60529)	Visual	Present	Present	PASS	N/A

5. Testing continued

	Test type	Test method	Expected result	Actual result	Pass/Fail	Amendment requirements
1	Power supply voltage tests with MCB's off.	Voltage tester - Multimeter.	20-28v - No circuit break trips.	24v	PASS	N/A
2	Power supply voltage tests with MCB's on.	Voltage tester - multimeter.	20-28v - No circuit breaker trips.	24V	PASS	N/A
3	Remote devices power cycle check.	Visual	Transducers to power on.	Power ON	PASS	N/A
4	Communications test.	Server PING test.	Reply from controller to programmer.	No reply	FAIL	Profinet cable damaged, remade cable and communications restored.
5	PLC to IBA communications	Find PLC on IBA software using internal PING function	Communications toggling	NO Comms	FAIL	Network switch not set up for profinet, change port properties and all communications working.
6	IBA to see S7 live tags	Look for data transfer from S7 into IBA taglist	Signals and live data present	Signals present	PASS	N/A

5. Testing Final

	Test type	Test method	Expected result	Actual result	Pass/Fail	Amendment requirements
1	AI signals test	Monitor values	Value range between 0-27648	Range set and signals tested	PASS	N/A
2	Scaling of transducers.	Set ranges and adjust as needed	I.e 0-27648 = 0-250 BAR.	Ranges set, one range found to be wrong.	FAIL	Range changed and all ok.
3	Live IBA graphs showing scaled values	Monitor live graphs	Scaled values should reflect real values, check display on transducers	Scaling out	FAIL	One transducer operating range found to be wrong in S7, changed and scaling now correct.
4	IBA recording data	Look at IBA database for stored results	Data files storing every 30 minutes	Files saving	PASS	N/A

Maintenance and reliability

- Maintenance required on the system
- Reliability of the system
- Reliability of the hardware/software

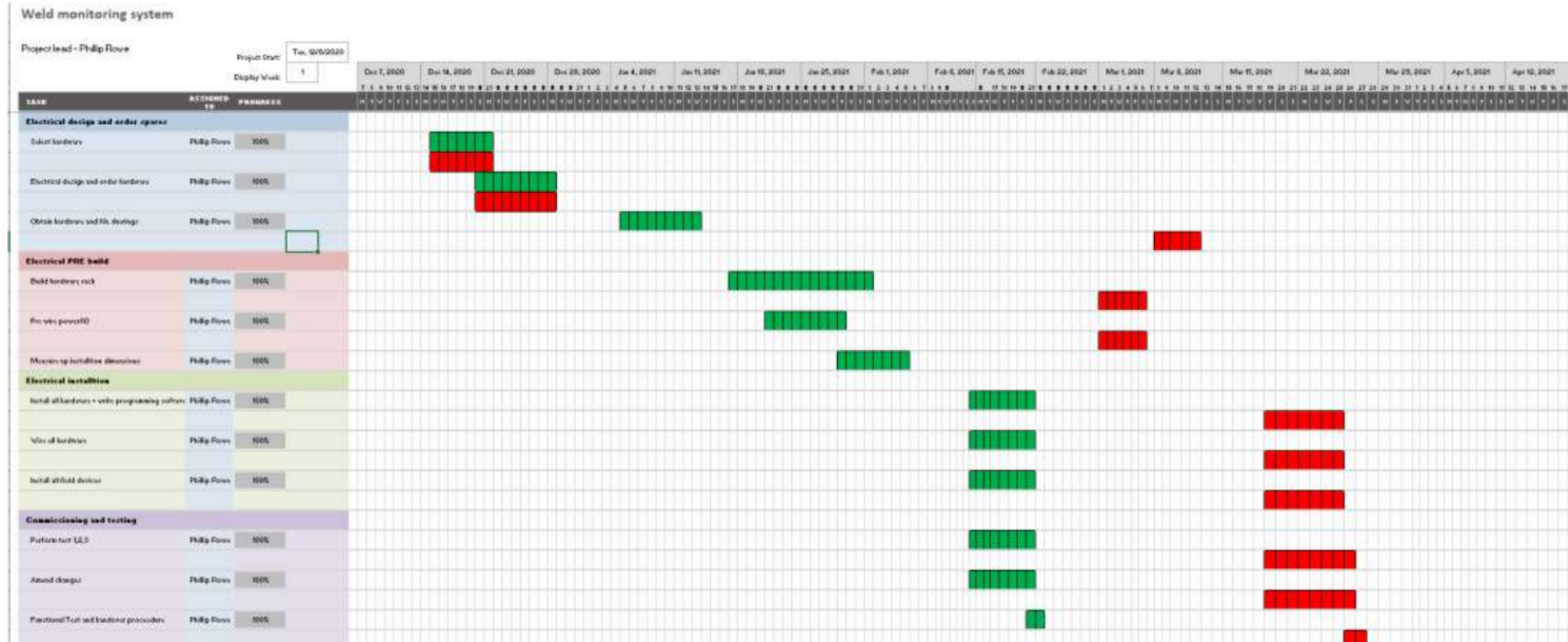
6. Solution vs FDS

- How effective was the solution?
- Did the solution meet the FDS?
- Comparison on final system to FDS.

7. Management techniques and planning.

- Management techniques used.
- How effective they were
- Additional techniques which could be used in the future

Planning



Budgets

Item name	Quantity	Price
S7 1516F CPU	1	£3229.15
S71500 PSU	1	£179.00
S71500 Rail	50cm	£62.00
Profinet connectors	4	£30.00
Module interface IM155-5	1	£315.00
Siemens 20A PSU	1	£140.00
AI input module	1	£210.00
AHR 500 B10 current transducer	1	£159.00
IFM PN2571 pressure transducer	2	£636.00
Calex CIRSPMHA201CTCRTMSD – temperature sensor	1	£400.00
0.5mm2 cable	20m	£14.99
1.0mm2 cable	20m	£20.00
2.5mm2 cable	20m	£30.00
Profinet cable	100m	£300.00
Bootlace Crimps	100	£10.00
Ferrules	100	£10.00
Electrical labour	200 hours	£4000.00
TIA license	1	£1500.00
IBA Analyzer	1	£1500.00

Total used was £12,745.14 which is under budget and leaves £2,254.86 left of the £15,000 overall budget.

8. Conclusions and recommendations

- Effectiveness of system
- System improvements
- System expansions

presentation 2

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

55/100

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13

GRADING FORM: NEW CSG-RUBRIC

PHILLIP ROWE

55

1. ENGAGEMENT WITH LITERATURE

 Section 3: Use of technical literature in final design solution: There is good evidence of use of technical literature in the design and referencing to standards A good range of sources, but limited references to wider issues. 3/5

3

2. KNOWLEDGE AND UNDERSTANDING

 Section 1: Introduction: Aims and objectives clear set out. Project was introduced as a weld monitoring system, aims and objectives were listed. Section 2: FDS: The original FDS was briefly review and additions pointed out. FDS was revisited, slides didn't show any of the actual requirements, instead various testing requirements were explained verbally such as tension test and pressure transducers. A change to the FDS involving a temperature probe was also justified. Section 3: Advanced knowledge and critical understanding demonstrated in the design of the project: There

17

was some evidence of knowledge and critical understanding though some points were overlooked or not considered. Perhaps there has been too much reliance upon industrial supervisor support. Knowledge of the project was good and there was some evidence of critical understanding, however it wasn't the most technically demanding project. All sections: Response to questioning: Good honest answers. 17/30

3. COGNITIVE AND INTELLECTUAL

-  Section 5: Testing and analysis of result: Some references made to testing, some presentation of results. Trend graphs could have been presented showing the performance of the system. Testing was described mainly as dead testing of continuity and tightness. Live testing was also described and problems explained. Section 6: Critical evaluation of the project outcomes and comparison with the FDS: Good evaluation of the FDS and project outcomes FDS was briefly evaluated, welds can now be monitored as required. Should have been more specific references to the FDS. Section 8: Overall conclusions and recommendations: Very good overall conclusions but recommendations were unclear Recommendations were vague such as adding more transducers, without really stating why. 16/30

16

4. PRACTICAL APPLICATION

-  The solutions is innovative, creative and appropriate for the industry. The solution is valid and satisfied the FDS. Good use of tools and equipment in the construction and installation of the project. The project comprised a remote IO rack, 2 pressure transducer and a screen, wasn't clear from the presentation how these were constructed. Excellent build quality. However, the SCADA screens could have shown larger trend graphs with alarm levels and early warning indicators

15

showing the direction of the current rather than waiting for it to drop below an acceptable level. The system works and has been employed by the factory. Little evidence presented of calibration using test equipment. Over reliance on the company to do the calibration periodically. There should have been proof presented showing that the readings were valid. Functional testing was explained covering the dead testing and functional testing aspects Good management techniques and planning 15/25

5. TRANSFERABLE SKILLS

 All sections: Quality of the presentation slides: Generally good but tables should have been checked before running the presentation as the text had been set to white on a white background. Many of the slides had white ink on a white background so were not visible. Other slides lacked detail e.g. FDS was a list of questions rather than answers. Photographs of the project were crammed onto 1 slide and covered the panel, the transducers and the testing screen. All sections: Quality of the delivery style: Good style, confident manner. Slides and explanation lacked detail and clarity at times. 4/10

4