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by Sean Parry

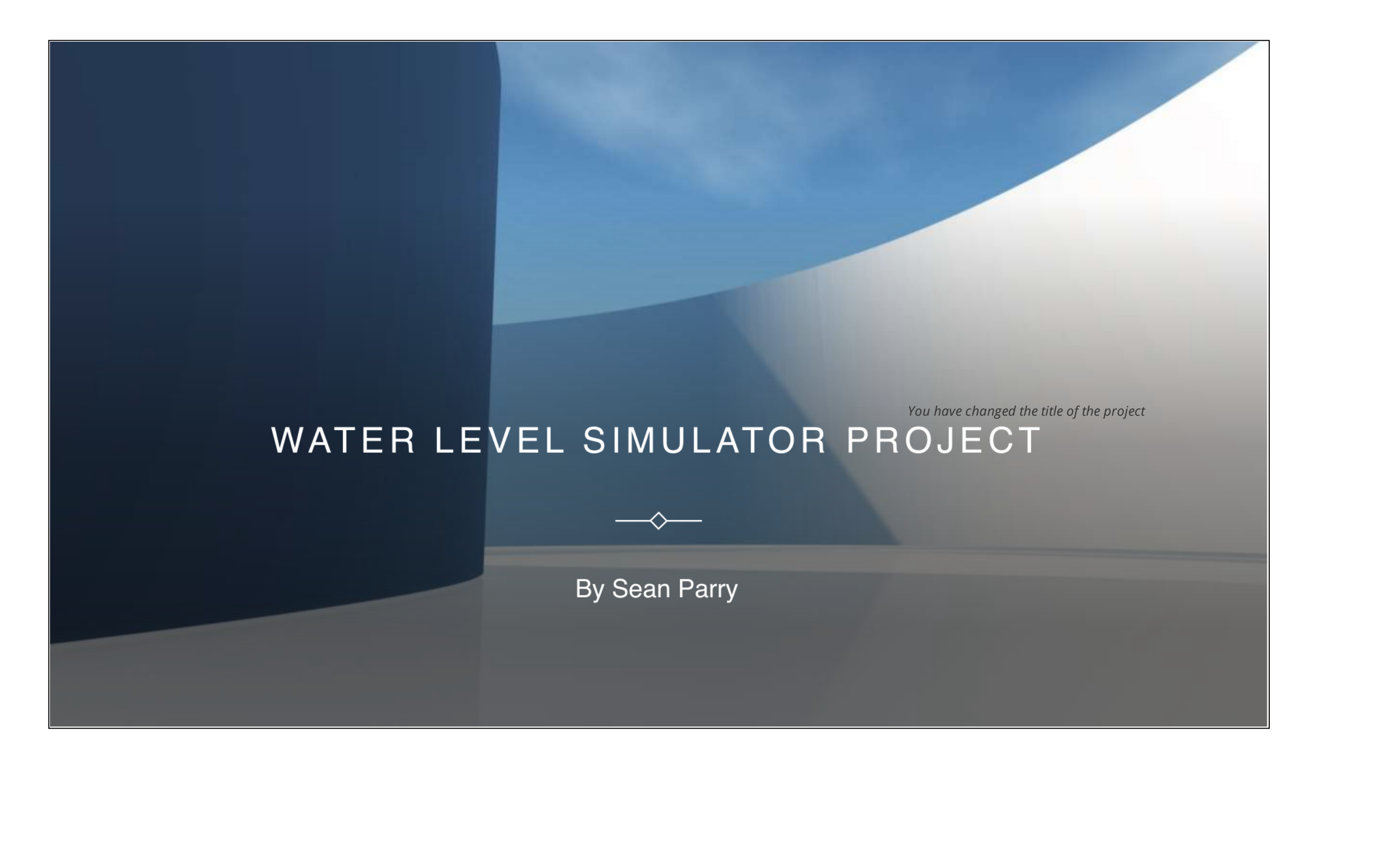
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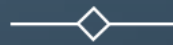
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You have changed the title of the project

WATER LEVEL SIMULATOR PROJECT



By Sean Parry

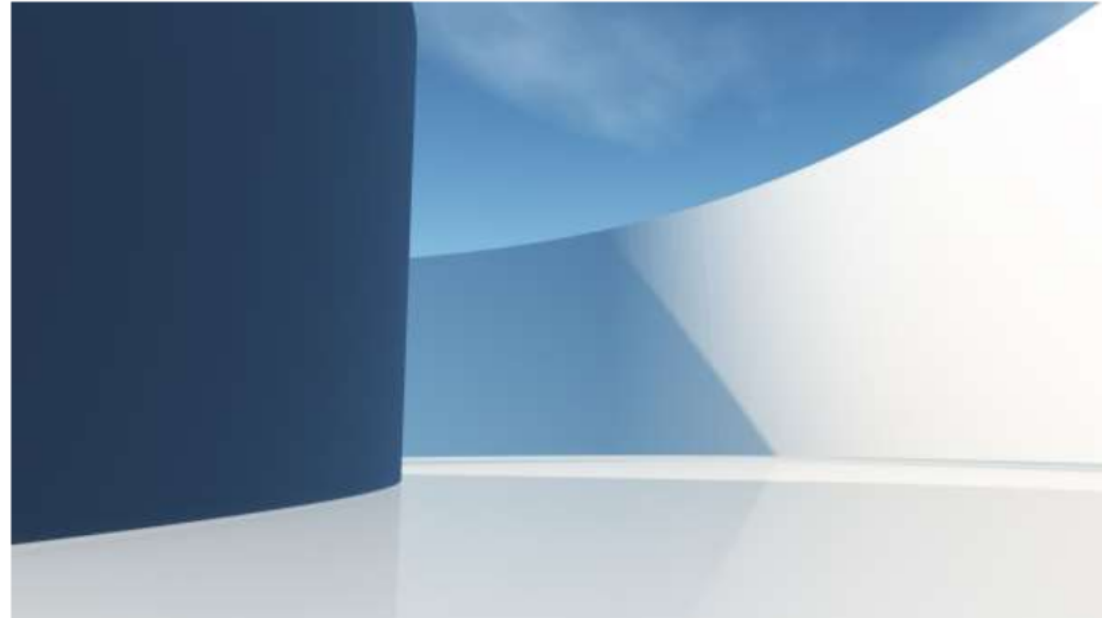
Introduction



Aims and Objectives

To achieve a water simulation process which can be adopted in an industrial environment.

To reduce the level of water in cable tunnels, which could potentially damage equipment.

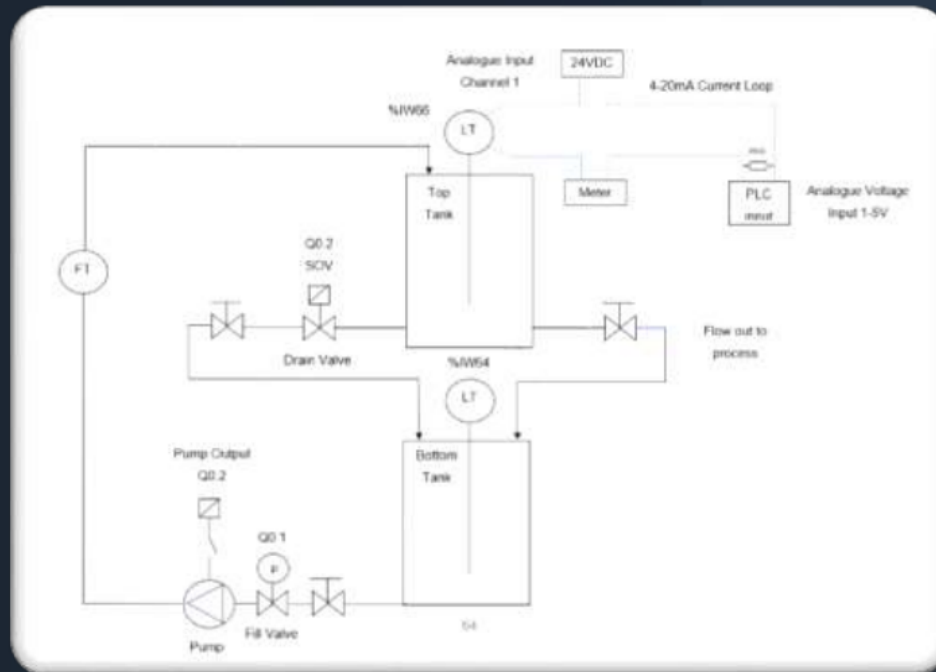


FDS

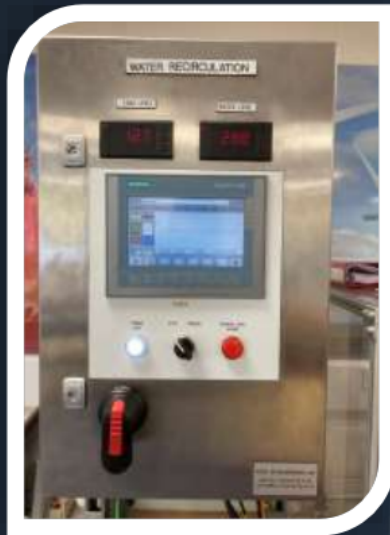
Functions	Requirements
F.2	Set up dead-band <1 and >1 of setpoint
F.10	Run pump manually to check dry pump isolator
F.11	Setpoint = 15 switch to auto
F.12	Open drain valve in auto
F.13	User unable to enter unsuitable setpoint
A.2	Graphic display of PV water level



Design details of the solution to meet the requirements of the FDS



Construction phase of the solution



Testing of the solution, analysis of results

Test Number	FDS Item Reference	Description of Test	Expected Outcome	Actual Outcome	Pass or Fail Decision	Evidence Reference
1	F.2	Set up dead-band, <1 and >1 of setpoint value.	Dead-band established.	Dead-band operational and displayed on HMI.	Pass	Figure 16
2	F.3	Ensure visual reading on HMI.	Level measurement clearly displayed.	Level measurement clearly displayed on HMI.	Pass	Figure 17
3	F.4	Must stop pump when water low <2.	2cm low level limit made.	2cm low level limit made.	Pass	Figure 18
4	F.5	Prevent water reaching a high level.	Water unable to reach high level.	Water level did not exceed dead-band	Pass	Figure 16
5	F.10	Run pump manually to check dry pump interlock.	When water <5.0 pump switches off.	Pump switches off at 5.0.	Pass	Figure 18
6	F.11	Setpoint = 15.0 switch to auto.	Pump runs until level >16.	Pump runs until level >16.	Pass	Figure 19
7	F.12	Open drain valve in auto.	Pump comes back on when level <14.	Pump comes back on when level <14.	Pass	Figure 20
8	F.13	User unable to enter unsuitable setpoint value.	HMI will not accept value <5 and >95.	HMI does not accept value <5 and >95.	Pass	Figures 21-24
9	S.4	Ensure electrical interlock fully operational.	Electrical interlock safely disables pump to prevent running dry.	Electrical interlock disabled pump as water level dropped below 2cm.	Pass	Figure 18

Critical evaluation of the project solution and outcomes, comparison with the FDS

Planned Outcomes	Actual Outcomes
To be able to run the pump in manual to check the dry pump interlock. Pump unable to run when water level <2 .	When water level <2 the pump switched off as expected, see figure 18.
When setpoint of 15 entered and switched to auto, pump runs until it reaches a level of 16.	Placed in auto and setpoint of 15 entered and pump ran until value of 16 was reached and then pump stopped and drain valve opened, see figure 19.
Opening drain valve in auto, the pump will only come on when the water level drops below 14.	Water level dropped below 14, the pump then started again and drain valve closed. See figure 20.
User setpoint limits must be included into the programming of the project to ensure that the user cannot enter unsuitable setpoint values that will cause the project to operate outside of its specification.	Setpoint limits were set at 5 and 95. The user could not enter a setpoint value less than 5 and a higher setpoint value of greater than 95 as seen in figures 21-24.

Review of management techniques and planning, comparison with initial plan



QMS – QUALITY
MANAGEMENT
SYSTEM



DOCUMENTED
PROCESSES – JOB
LOGS & SAP



PROCEDURES –
MOC & RISK
ASSESSMENTS



Review of management techniques and planning, comparison with initial plan



Overall conclusions and recommendations



SATISFYING THE
FUNCTIONS OF THE
FDS



ACTUAL OUTCOMES
SATISFIED PLANNED
OUTCOMES



SUCCESS
ACCORDING TO THE
TEST PLAN



FINAL GRADE

GENERAL COMMENTS

46/100

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GRADING FORM: NEW CSG-RUBRIC

SEAN PARRY

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1. ENGAGEMENT WITH LITERATURE

 na

2. KNOWLEDGE AND UNDERSTANDING

 Project design
There were good slides included, however, the PLC program slides were missing. Some of the explanations were not accurate. The FDS requirements were identified with the process.
Little evidence presented. (4/10)
Project implementation
Slides only partially indicated the implementation, although the explanation did include significant points. The PLC program networks were not included in the explanations.
Some explanation given. (5/10)

14

Response to questions

Some understanding demonstrated.

Response to some questions was inaccurate and lacked confidence especially for the deadband purpose. There were good answers to the interlocks for the system.

(5/10)

14/30

3. COGNITIVE AND INTELLECTUAL



Testing and analysis of results

Good list and analysis.

Test results were explained, but there were some inaccuracies included. (5/10)

Critical evaluation of the project outcomes relating to FDS and constraints

Some explanation given.

Outcomes were compared with original FDS requirements but with some inaccuracies with the tanks and deadband purpose. (4/10)

Conclusions and recommendations

Some explanation given. Conclusion only discussed the success with ref to FDS

No recommendations offered. (3/10)

12/20

12

4. PRACTICAL APPLICATION



Deployment method, use of material, tools, equipment and techniques in the construction of the project.

Good methods used and material. Program not shown in presentation. Project development was explained, but lacked details of components used. No logical order of development was explained. Simulation relevance was explained. (5/10)

Quality of the final product or system

Good quality of product. The system was built and tested even though the explanations lack detail. (6/10)

Management of the design process including use of plans, costing spreadsheet

Some explanation given. Gantt chart was explained with ref to issues caused by the industry (3/10)

14/30

14

5. TRANSFERABLE SKILLS



Quality of the presentation slides

Some slides included relevant details, however, significant sections such as the main PLC program was missing. (3/5)

Quality of the delivery style

Good but sometimes hesitant. Some good points covered, but there were inaccuracies in the delivery. (3/5)

6/10

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