

ENHANCING THE EFFICIENCY OF SPRINKLER SYSTEM PLANNING AND INSTALLATION WITH A FOCUS ON COST-EFFECTIVENESS

A REPORT IN PARTIAL FULFILLMENT FOR
BACHELOR OF ENGINEERING: MECHANICAL AND
MANUFACTURING ENGINEERING

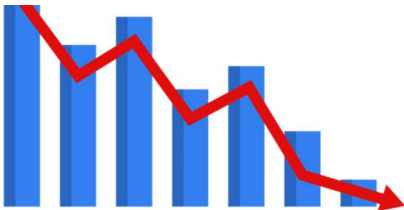
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TYCO, WORLD LEADERS IN FIRE PROTECTION COMPONENT MANUFACTURING, AND RENOWNED FOR THEIR SPRINKLER SYSTEM DESIGN AND INSTALLATION, AS ONE OF THE ONLY LEVEL 4 COMPETENT FIRE SPRINKLER COMPANIES IN THE UK, HAVE RECENTLY BEEN UNDER PERFORMING, FAILING TO MAINTAIN DESIRED PROFITS.



THIS PROJECT AIMED TO OPTIMISE SPRINKLER SYSTEM PLANNING, DESIGN AND INSTALLATION WITH A COST FOCUS EFFECTIVENESS.



PROFIT REDUCTION PRELIMINARY REVIEW HIGHLIGHTED:



EXCESSIVE COSTS ASSOCIATED WITH DESIGN AND INSTALL OF AUTOMATIC FIRE SPRINKLER SYSTEMS.



PROFIT REDUCTIONS.
- 7% REDUCTION OF JOBS OVER £1 MILLION.
- 11% REDUCTION OF JOBS OVER £10 MILLION.



OVERSPEND ON HOURS ALLOCATED FOR TASKS IN DESIGN AND HYDRAULIC VERIFICATION PROCESSES.

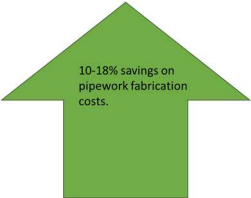
THE PROJECT USED TECHNIQUES SUCH AS DMAIC AND 5’S TO IDENTIFY OPPORTUNITIES OF OPTIMI- SATION WITHIN THE PROCESS, INCLUDING PROCUREMENT, DESIGN, HYDRAULIC ANALYSIS AND INSTALLATION.

THE PROCESS OPTIMISATION INCLUDED REVIEW FROM PROCESS REVIEW, SOFTWARE ANALYSIS , PROCESS SHADOWING AND INTERVIEWING EMPLOYEES TO HELP IDENTIFY COST AND TIME SAVING OPPORTUNITIES.



Pre-contract procurement	Project commencement	Project Completion
Procurement Team Review, cost and estimate the project, putting forth a contract to the client.	Design Team Undertake full and complete design, including co-ordination, calculations and send for fabrication. Installation Team Ensure installation is in accordance with design drawings and installation manual handbook. Complete commissioning for handover. Operations Engineers Team Ensure plant and relevant equipment such as supports and hangers are on site to allow for installation commencement. Provide Design and installation teams with programme of works, updating when required. Ensure design team get relevant information off installation team to carryout tasks required prior to handover.	Design Team Produce record drawings revised with order modifications. Produce client with handover documents and O&M Manual. Operations Engineers Team Secure final payment from client.

PROCESS REVIEW FINDINGS—RESULTED IN A CLEAR FORMATTED IN THE NEW TENDER DOCUMENT. IMPLEMENTED IN 9 CONTRACTS FEB—MARCH 2024, PROVED SUCCESSFUL WITH POSITIVE COMMENTS ON IT’S INFLUENCE ON THE TASK DELEGATION BETWEEN PROCUREMENT AND DESIGN.



HYDRAULIC SOFTWARE ANALYSIS RESULTED IN THE IMPLEMENTATION OF DARCY-WEISBACH FORMULA, THE MOST SUPERIOR FOR FRICTION LOSS IN PIPES, AND SOFTWARE REWORK OF DEFAULT SETTINGS PROVIDING UPTO 18% SAVINGS ON PIPE MANUFACTURING.

ENHANCING SPRINKLER SYSTEM PLANNING AND DESIGN, THROUGH THOROUGH REVIEW OF LITERATURE, DATA COLLECTION THROUGH INTERVIEWS, PROCESS SHADOWING AND DMAIC AND 5S METHODOLOGIES.

OUTCOMES:

- POSITIVE FEEDBACK FROM IMPLEMENTATIONS OF CLARITY AND COMMUNICATION STRATEGY.
- COST SAVINGS FROM SMALLER PIPES CALCULATED THROUGH THE HYDRAULIC SOFTWARE BETA TESTING.
- REDUCTION IN OVERSPEND OF ALLOCATED HOURS FROM ELIMINATED REWORK FROM CLARITY STRATEGY AND INTERVIEW FINDINGS.