EXECUTIVE SUMMARY

High machinery downtime in the finishing department of Teejay Lanka PLC is addressed by this project. Knitting and dyeing departments' machine downtimes are well maintained within the target, but over the last financial year, the average actual finishing machine downtime was 2.91% against the target of 2.0% over the total available time. Considering the manufacturing process, machinery downtime is the topmost cause for generating a production backlog in the factory. Production delays led to financial losses in multiple ways, including customer air-freights claims. The total loss was calculated as LKR 121.5 million for the financial year 2020/21.

Teejay Lanka PLC is the largest cotton fabric manufacturer in Sri Lanka, generating more than 40 metric tons per day. Last financial year, it secured a revenue generation of USD 240 million (LKR 48.7 billion), and its main factory is situated at SEPZ (Seethawaka Export Processing Zone), Avissawella. SWOT analysis highlighted its internal strengths, external opportunities, and potential threats. However, machinery downtime was identified among its weaknesses. Associated key issues to the main problem were identified as machinery breakdowns, premature failure of spare parts, high service time by the engineering technicians, high time is taken for weekly cleaning by operators, the high number of quality defects by operator faults, and repetition of same breakdowns. CED (Cause and Effect Diagram) was developed by project team brainstorming. The root causes were determined by categorising them as machinery, internal process, and skills management.

Detailed literature reviews were conducted with ranked journals, peer-reviewed articles, other academic materials, and corporate world writeups from the warranted knowledge. The areas covered are manufacturing, machinery lifecycle, machinery ageing, factors affecting machinery downtime, machinery breakdowns in the textile industry, maintenance, utility supplying to machines, spare parts inventory management, internal processes in manufacturing, service maintenance, machinery cleaning, maintenance management systems, tools management, supervisory SOPs (Standard Operating Procedure), machine and technology-related training, talent availability and talent sourcing, skill-based remuneration, production target incentives, and employee motivation. A study framework was developed for the project based on the literature reviews. Proven solution techniques such as CM (Corrective Maintenance) and PM (Preventive Maintenance), AM

(Autonomous Maintenance):PM Ratio, CLIT (Cleaning - Lubricate - Inspection - Tightening) technique, process modernisation, process mapping and SOP, skill matrix, and KPI (Key Performance Indicators) setting were described.

The key objective of the project is established as "to reduce the machinery downtime from 2.91% to 2.0% in the finishing department of Teejay Lanka PLC" with associated sub-objectives defined as to reduce the machinery breakdowns of selected finishing machines from 4.9% down to 1.2%, to eliminate cost incurring for premature failure of spare parts which is currently at 7.2%, to reduce the machinery service time from 8.4% to 6.3%, to reduce the weekly cleaning time from 3.2% to 2.7%, to reduce the fabric quality defects by operator faults from 0.10% to 0.05%, and to eliminate repetition of the exact breakdown from 0.4% to zero. The current condition of the project components was analysed. Solutions and plans for each problem were developed with details attached as appendices. Resource allocation and roles of each member were outlined. Finally, the cost estimates for the project were summarised.

The project's tangible and intangible benefits were identified and quantified in financial terms. The total benefits were summed as LKR 44,455,244. The detailed calculations were attached as appendices. The total costs for the proposed solutions were totalled LKR 10,130,548. Therefore the benefit-cost ratio was derived as 4.39 for the project. These calculations were done considering the cash flows of the first year of the project implementation. The outputs and outcomes of the project were forecasted based on the project components.

The linkage and validation of the solutions proposed to bridge the performance gaps were authenticated by the literature again. The project findings were endorsed by warranted knowledge. There are specific recommendations charted, which will provide an assurance instead boost to achieve the outputs and outcomes of the proposed solutions. These are described under implementing solutions for the complete set of machinery, implementation schedule, managing overburden of duties, leadership drive, machine manufacturer's support, and industry experts to assess the skills. Throughout this entire project, the author developed conceptual, technical, and interpersonal skills.