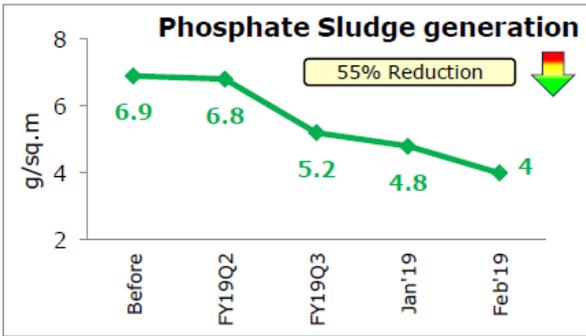


IAQ QUALITY SUSTAINABILITY AWARD 2020 - ONE-PAGE SUMMARY

The One-Page Summary should be filled in and submitted as Appendix 1 to your Application. It will also be published on the IAQ Quality Sustainability Award Homepage; <http://iaqaward.com>. The length of this document must not exceed 1 page.

Project and contact details		
The name of the quality sustainability project (max. 100 characters) Phosphate Sludge (hazardous waste) generation reduction in Cab pre-treatment line		
Contact Person Rajesh Kumar	Telephone 9994580078	Email Rajesh.Kumar@ashokleyland.com
Organisation(s), country, where the project-members are working, including Web-page links Ashok Leyland Ltd. (India)		
Project description		
<p>Essence of the project and Problem statement: As per state regulation, the authorized limit for paint sludge generation is 300 MT/annum & phosphate sludge generation is 24MT/annum. Paint sludge generation is well within the authorized limit but phosphate sludge generation (Hazardous Waste) is a concern as it is nearing the authorized limit. Going forward, there's a risk involved as the production volumes are predicted to be higher by 20% which may further lead increase in waste. Project objective is to reduce Mean Phosphate sludge generation from 6.92 g/sq.m to 4 g/sq.m.</p> <p>Methodology: Six Sigma DMAIC methodology is used to solve the problem.</p> <p>Observation and Analysis : Nine probable causes are identified for high phosphate sludge generation. Detailed cause validation reveals that moisture content present in Phosphate sludge is very high (61% of sludge weight).</p> <p>Improve (Finding, Implementing the solutions with resource used): To address this issue of high moisture content in Phosphate sludge, drying bed is installed, and drying process is continued. As a result, Mean Phosphate sludge generation reduced from 6.92 g/sq.m to 5.22 g/sq.m. But even with improved performance, annual sludge disposal will stand at 26 MT against Govt. regulation of 24 MT. To further reduce the Sludge, team searched out for new generation Pre-treatment Chemicals. From our research, best and most suitable is 'compact & fine phosphate coating chemical'. After implementation, Mean Phosphate sludge generation is reduced to 4 g/sq.m. As part of risk analysis, we checked if there's any adverse impact on Consequential metric (Phosphate coating weight). Phosphate coating weight process is stable and capable as Ppk is 1.83.</p> <p>Some results and Effects: Mean Phosphate sludge generation reduced from 6.92 g/sq.m to 4 g/sq.m; Phosphate coating weight process is stable and capable as Ppk is 1.83.; Phosphating process time reduced from 90 sec to 60 sec. Productivity improved by 12% ; DM water requirement reduced from 180 KL to 120 KL per annum ; Financial benefit of INR 5.25 Million. ;Reduction of carbon footprint.</p> <p>Resources used: Expenditure of INR 0.1 Million for Phosphate sludge drying bed construction.</p> <p>Locking & Cloning the Improvements: Operation controls procedures are changed, and training has been given to all associated members. Detailed case study is shared and communicated to all plants of Ashok Leyland.</p> <p>Tools used in the project: Variable MSA (GRR study), Pugh matrix, Test of Hypothesis (2 sample t-test), Process capability studies, Variable Control charts, Risk analysis.</p>		

Project leverage potential	Picture/Image describing the project												
<p>There's a possibility of replicating the project to another plant of Ashok Leyland which is under progress now.</p> <p>This project could easily be replicated to other organizations globally wherever Phosphate Sludge is being generated and there's a significant potential to reduce it. It can be done with minimal investment. Scope includes:</p> <ul style="list-style-type: none"> Auto OEMs & Railways where pre-treatment phosphating process happens. Consumer Durable & Home Appliance businesses where powder coating is required 	 <p>The graph shows phosphate sludge generation in g/sq.m over five periods: Before (6.9), FY19Q2 (6.8), FY19Q3 (5.2), Jan'19 (4.8), and Feb'19 (4). A callout box indicates a 55% reduction from the 'Before' state to the 'Feb'19' state.</p> <table border="1"> <caption>Phosphate Sludge generation (g/sq.m)</caption> <thead> <tr> <th>Period</th> <th>Generation (g/sq.m)</th> </tr> </thead> <tbody> <tr> <td>Before</td> <td>6.9</td> </tr> <tr> <td>FY19Q2</td> <td>6.8</td> </tr> <tr> <td>FY19Q3</td> <td>5.2</td> </tr> <tr> <td>Jan'19</td> <td>4.8</td> </tr> <tr> <td>Feb'19</td> <td>4</td> </tr> </tbody> </table>	Period	Generation (g/sq.m)	Before	6.9	FY19Q2	6.8	FY19Q3	5.2	Jan'19	4.8	Feb'19	4
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