

**Title:** Quality improvement of Foundry Operation in Nigeria using Six Sigma Technique.

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**Abstract:** In this paper Six Sigma DMAIC analysis was applied in an aluminium mill in order to identify sources and causes of waste with the intention of providing veritable solutions. The foundry section was the segment under scrutiny. Re-work or defects in this firm was found to be on the average of about 37.05% of total production for the twenty-three months under study (January 2009- December 2010). Defect reduction was therefore chosen as the Critical-to-Quality (CTQ) factor. The sigma level of 1.87 in the firm indicated the existence of opportunities for improvement. Analysis was carried out using SPSS, SPC for Excel to perform regression analysis, process capability analysis, generate descriptive statistics, histograms and run charts. The results of these analyses identified three major defects and some of their behaviours. Based on the analysis, solutions were proffered in the Improve and Control phases of this project. Implementation of the proffered solutions resulted in noticeable improvement and led to the firm operating with near- perfect processes thus proving the applicability of Six Sigma.