ABSTRACT

This thesis attempts to enhance performance of a foundry. Performance of foundry is measured by factors like quality improvement, productivity improvement, optimum utilization of resources and timely delivery. In this research work, the process of an iron foundry has been studied and performance enhancement suggested using advanced techniques such as Design of Experiments and Genetic Algorithm.

Selection of suitable casting process requires a sound understanding of interactions between casting design constraints, required product properties, technical limitations of casting methods, available tooling, and overall cost determining factors. It is necessary to improve quality of cast product without increase in price of product. Attention to quality assurance could reduce wasteful rework. Such quality production would result in foundry’s performance enhancement.

Besides achieving results through process improvements to minimize defects, a study that could identify optimum methods of manufacturing ensuring required quality, minimization of non-conformities, cost reduction, improved utilization of machinery and timely delivery, would therefore, be of immense importance to manufacturer of castings, leading to overall performance enhancement.

In this concern, this thesis presents the attempts made to enhance performance of an iron foundry through

(i) Process factor optimization,

(ii) Furnace productivity optimization and

(iii) Resource utilization optimization.