Integrating Six-sigma Technique with Failure Mode and Effects Analysis to Determine Product Defects.

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- **Abstract:** The present study aims to improve the quality level of electrical distribution transformers using integration between Six-Sigma technique, failure mode, and effects analysis (FMEA) method. The present study was conducted in Diyala State Company for Electrical Industries, Distribution Transformers Factory. The hexagonal diffraction technique was applied using the five-stage (DMAIC) methodology (definition, measurement, analysis, optimization, and control). The number of monthly defects and their types were determined to identify and define the problem in the process of production of distribution transformers. The number of defects per color opportunity (DPMO) was measured, and the result was (25737) defects per million opportunities for defects to appear. The diffraction level (Sigma Level) was measured, and the result was that The production process operates within the diffraction level of (3.55). The (FMEA) method was used in the analysis stage for the purpose of finding the weight of each defect to determine which of the defects has the highest value of (RPN) and its impact on the quality level of the process. As for the improvement stage (Improvement, recommendations, proposals, and solutions were developed for the management of the plant for the purpose of improving the production process. The proposed improvement recommendations were applied and moved to the fifth stage (Control). An evaluation of the improvement process was carried out after its application and the number of defects per million opportunities (DPMO) was measured, and the result was (9982) defects per million opportunities to appear. The diffraction level (Sigma Level) is (3.89). This means that the quality level of the production process has improved by (9%). This is a good achievement at industrial organizations.

- **Keywords:** Six-Sigma technique, Hexagonal diffraction technique, DPMO, Industrial organizations