AN ABSTRACT OF THE THESIS OF

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Title: Quality Capability Self-Diagnosis: A Multicriteria Evaluation Approach

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Quality Capability Self-diagnosis is a convenient and economical way to assess the performance of an operating quality system, as well as a basis for initiating necessary corrective actions essential to quality improvement and preparation for certification. This paper describes the research leading to the development of a cost-effective and systematic methodology for performing quality capability self-diagnosis. ISO 9000 series standards and the methods used to implement multicriteria system evaluation are employed to provide a sound basis for the development of this quality capability self-diagnosis scheme (QCSDS).

The QCSDS has been developed to assist manufacturers in the conduct of quality assurance audits using internal personnel. The methodological structure of QCSDS is presented in two major parts: a regular model and a refined model. The regular model includes: (1) development of quality

system auditing criteria, (2) selection of a suitable checklist developed from ISO 9000 series requirements, (3) development of importance weights for applicable criteria, (4) performance measurement, (5) quality system rating, (6) analysis of quality auditing results, and (7) suggestions for improvement. The refined model is developed to strengthen capability of the model and its reliability for confirming the effectiveness of an operating quality system using quality cost analysis, utility theory and regression analysis.

A decision support system (QCSDDSS) based on the Quattro Pro spreadsheet is incorporated to facilitate the application of QCSDS. The QCSDDSS development is based on the regular model using ISO 9002 to provide both tabular and graphical displays for performance demonstration and improvement analysis.