

KHARKIV NATIONAL UNIVERSITY OF RADIOELECTRONICS

Department of Metrology and Technical Expertise

**PROJECT PROGRAM
EDUCATIONAL PRACTICE**

specialty students

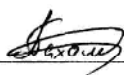
«METROLOGY AND TECHNICAL EXPERTISE»

at JABIL CIRCUIT UKRAINE LLC.

Uzhhorod 2020

DEVELOPED BY

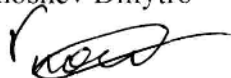
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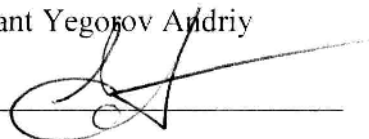
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INTRODUCTION

The draft practice program was developed in the process of studying the discipline «Monitoring and diagnostics of production processes» at the Department of Engineering and Technology. To achieve the goals of the internship, it is planned to implement a methodology for improving DMAIC processes. The main goal for the enterprise is to improve process control.

As part of this goal, the educational goal of the practice will surely be achieved: students getting cafes. MTE abilities, skills and experience in the statistical management of production processes.

1. GENERAL PROVISIONS

The purpose of educational practice: based on the results of statistical studies of a specific production process, formulate a proposal for its improvement.

Scope: in this document the list of tasks which should be realized by students of gr. MTTE-17-1, cafe MTE, KNURE during training practice at the company JABIL CIRCUIT UKRAINE LLC. from February 17 to March 7, 2020 in Uzhgorod. This document can be considered as an addition to the approved program of practice and can be accepted for execution if desired by all interested parties.

2. REGULATORY LINKS

ISO 9000:2015 (ISO 9000:2015, IDT)

ISO 9001:2015 (ISO 9001:2015, IDT)

ISO 13053-1:2016 (ISO 13053-1:2011, IDT)

ISO 13053-2:2016 (ISO 13053-2:2011, IDT)

1. DMAIC.
- 2.

3. RELATIONSHIP OF INTERESTED PARTIES

Trainees should learn and understand safety rules and corporate ethics.

Representatives of the host should determine the responsibility and empower trainees as part of the tasks of the bottom program. For example, the authority to study the documentation for the process, conducting control and monitoring operations.

Also, representatives of the host party should (if possible) ensure the implementation of the program with resources related to the control (measurement) of the necessary production processes.

4 PRACTICE GOALS

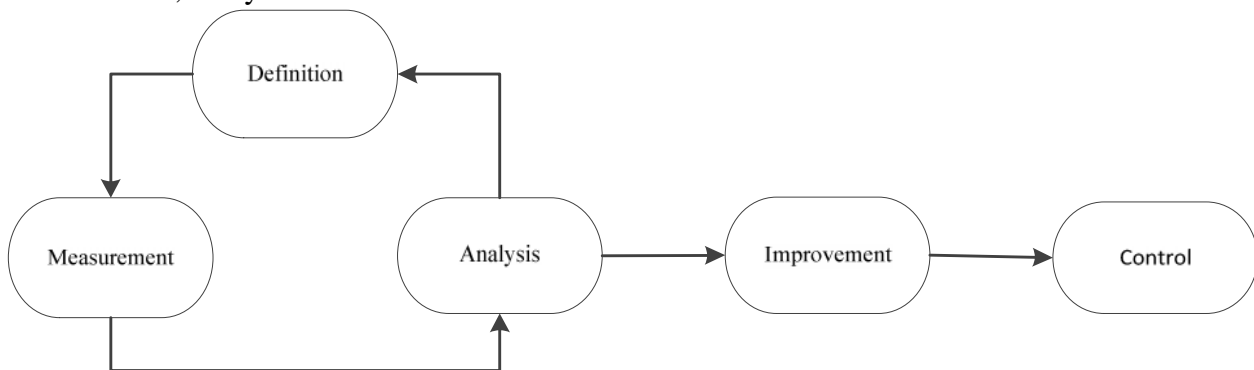
Together with the representative of the enterprise, it is necessary to identify production processes that require improvement and will be investigated. To achieve this goal (process improvement), you need to have an understanding of production and its context.

This can be done by studying the process documentation and familiarizing yourself with company knowledge. The description of the internal and external contexts of the process under study should be sufficient in its entirety to solve the tasks of the program.

The desired result (goal) of the work is to assess the quality of the process, identify the causes of unsatisfactory quality (carry out diagnostics) and make suggestions for improvement.

To achieve this goal, this program implements (to a limited extent) a DMAIC process improvement methodology, elements of statistical process control, and some requirements of the ISO 9001 standard.

Applying the DMAIC methodology, we restrict ourselves to the cycle of «determination, measurement, analysis».



To search for the causes of discrepancies at the appropriate (acceptable) level of detail of the process, it may be necessary to implement this cycle several times.

The owners of the process will implement the correct (acceptable, effective) recommendations on their own.

4.1 Stage of determination

The result of the stage of determination is the description (definition, representation) of the object of the production process that requires improvement. To do this, research is needed – to solve the following problems:

1) Identify the process, define its context, separate it from the rest with suppliers, (limit) and connect it with others (display real relationships by members and other interested parties). Clearly define the scope of research (the boundaries of the object) and the goals that should be achieved at the end of the study (to determine the causes of marriage, the variability of the process, it is «support» etc). To do this, you need to use the documentation for the process and interviews with the process manager.

2) Present the diagram «supplier-source-data process-output data – consumer». Describe the requirements for all elements of the diagram (element parameters). Describe the function that the process implements.

3) Define (list, describe) the target and real if any) process characteristics that are critical for quality (quality indicators).

4) Identify the problems of the process and their scope (number of defects, financial losses, etc.).

5) Perform a preliminary analysis of the data, including risk analysis.

The selected process for the study should not be too «large» «wide». The scope and detail of the description should allow to realize all the tasks set in the program.

4.2 Measurement (control) stage

The purpose of the stage is to collect data on variables (parameters) that affect quality.

Stage results:

1) Data collection plan (determination of the volume of observations, a list of measured characteristics, control by numerical data, data registration forms, types of control charts, etc.).

2) Data of the necessary resources (means of control, measurements).

3) The obtained observation results (data tables).

4) Calculated statistical indicators, if necessary, histograms.

5) Control charts that illustrate trends.

4.3 Analysis stage

The purpose of the stage is to determine the conformity of indicators to their target values, to identify the main causes and sources of deviations, to identify and rank opportunities for improvement.

Data obtained at the measurement stage should be examined in detail using statistical methods.

The data obtained at the measurement (control) stage can change the understanding of the problem and lead to the need to refine the definition of the process. This means repeating the cycle of «definition, measurement, analysis». It may be necessary to deepen the details of an object, or to consider another process, or how processes interact.

Analysis tools: statistical analysis, Shekhart maps, a diagram of cause-effect relationships, analysis of 5 why and others.

The result of the stage depends on the goals set and on the cycle number «determination, measurement, analysis». The results of the stage may include some of the following:

1) Diagram of causal relationships

2) Analysis 5 why

3) Determination of sample size

4) Probability distribution checks

5) Statistical process parameters

6) The values of key process indicators, including reproducibility

7) Hypothesis testing

8) Experiment planning

9) A list of important input and output parameters

10) Loss identification

11) Analysis of the project as a whole and recommendations for improvement, other

12) Criteria and methods (including monitoring, measurements and relevant indicators / indicators of activity) that are necessary to ensure the effectiveness of the functioning of processes and management of process characteristics.

5 PRACTICE REPORT REQUIREMENTS

5.1 Report Design Requirements

- 1) Font Times New Roman, size 12 pt; margins: left, right, top and bottom - 2 cm; line spacing - single;
- 2) The main text: alignment in width; indentation - 1.25 cm;
- 3) The report contains a cover page with signs of identification of the document. There is a place for reviewers and the head of practice.
- 4) Figures and tables are numbered and have names.
- 5) Pagination at bottom left.
- 6) The electronic version of the report is submitted in word 2003 format.
- 7) Format of visio drawings.

5.2 Content Requirements

The content elements that should be reflected in the practice report are listed below. The volume of the report.

- 1) A specific goal should be formulated.
- 2) It is necessary to describe the features of the stages «determination», «measurement», «analysis». This whole body of research. Stages of work include goals, description (definition) of processes, sequence of actions during research, application of methods, techniques, tools, data collection tools, direct data, their graphical and numerical representation. Almost everything that is indicated in sections 4.1, 4.2, 4.3.
- 3) Recommendations should be made to improve the process. The recommendations are aimed at identifying the causes.
- 4) There should be cover and other pages necessary for documents, content, list of used documents and literature.
- 5) It is necessary to draw conclusions that managed to achieve the goal. If the goal is not achieved, analyze the reasons for this.

6 RECOMMENDED LITERATURE

1. Understanding Statistical Process Control / Donald J. Wheeler, David S. Chambers, Published by SPC Press, Inc. (1992).
2. / ; . - 3- . - . : , 2019. - 409 .
3. / . . . : , 2005. - 340 .
4. ISO 13053-2:2016 (ISO 13053-2:2011, IDT) . 2.
5. KPMS . <https://www.kpms.ru/>.