

## Leading measurement systems analysis (MSA) activities

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### Overview

This standard covers the competences required for leading measurement systems analysis (MSA) activities. It involves approving an appropriate measurement system on which to carry out the analysis, and obtaining and approving all the necessary data in order to carry out the measurement systems analysis. You will be expected to lead the application of the principles and processes of measurement system analysis, which will include such things as directing the completion of a calibration study on a gauge, leading a gauge linearity study, leading either an attribute or a variable gauge repeatability and reproducibility study, directing a metrology study on a measurement system which includes either a variable or attribute gauge repeatability and reproducibility study.

You will be required to lead the carrying out of the analysis using the appropriate techniques, and to confirm the recording of the results of the analysis in the appropriate format. From this information, you will need to confirm the percentage gauge repeatability and reproducibility of the measurement system under study, and to lead the production of a detail report suggesting ways in which the measurement system might be improved.

Your responsibilities will require you to comply with organisational policy and procedures for the activities undertaken, and to report any problems with the activities that you cannot solve, or that are outside your responsibility, to the relevant authority. You will need to ensure that all the necessary documentation is completed accurately and legibly. You will be expected to take full responsibility for your own actions within the activity, and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will provide a good understanding of measurement systems analysis, and will provide an informed approach to the techniques and procedures used. You will need to understand the principles and application of MSA, in adequate depth to provide a sound basis for carrying out the activities to the required criteria.

Applying and advising on safe working practices will be a key issue throughout.

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### Performance criteria

#### You must be able to:

1. work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. approve the selection of an appropriate measurement system on which to carry out the analysis
3. obtain and approve all the necessary data in order to carry out the measurement systems analysis
4. lead the carrying out of the analysis, using the appropriate techniques
5. verify the results of the analysis are recorded in the appropriate format
6. agree the percentage gauge repeatability and reproducibility of the measurement system under study, and approve ways of improving the measurement system
7. lead the production of a measurement systems analysis report, detailing ways of improving the measurement system under study

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## Knowledge and understanding

## You need to know and understand:

1. how to work safely at all times, complying with health and safety and other relevant regulations, directives and guidelines
2. how to plan the resources and time needed to carry out the agreed activity
3. why we should study our measurement systems
4. how to select a measurement system for analysis
5. the possible sources of measurement systems variation
6. the use of measurement systems analysis, and how it can be used in a six sigma improvement project
7. how to conduct a variable and a attribute repeatability and reproducibility study
8. the terminology used in measurement system analysis
9. how to conduct a measurement systems analysis study
10. how to calculate gauge repeatability and reproducibility
11. how to calculate gauge precision and tolerance
12. industry rules for repeatability and reproducibility results
13. the extent of your own authority within the project, and to whom you should report in the event of problems that you cannot resolve

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## Scope/range related to performance criteria

1. Lead the activities within your area of responsibility to include **all** of the following:

1. set out and communicate the purpose of the improvement activities
2. involve the team in planning how the improvement activity will be achieved
3. ensure each team member has individual objectives and understands how these objectives contribute to the overall improvement objective
4. provide advice and support the team to achieve both team and individual improvement objectives
5. motivate the team to present their own improvement ideas
6. encourage the team and/or individuals to take the lead where appropriate
7. agree the implementation of the improvement ideas
8. negotiate any physical and/or financial resources required to implement the improvement activity (where appropriate)
9. monitor the progress of improvement activities
10. deal with any organisational problems identified during the improvement activity

2. Lead the carrying out of a measurement system analysis, which includes **three** from the following:

1. completing a calibration study on a gauge
2. conducting a gauge linearity study
3. completing either an attribute or a variable gauge repeatability and reproducibility study
4. conducting a metrology study on a measurement system which includes either a variable or attribute gauge repeatability and reproducibility study

3. Agree the type of measurement system variation, to include **two** of the following:

1. bias
2. linearity
3. stability
4. accuracy
5. repeatability
6. reproducibility



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