
Professional Certificate in Root Cause Analysis for Safety Professionals

Introduction to Root Cause Analysis

****3-sigma limit:**** A control limit that is three standard deviations away from the centerline in a control chart. It represents the upper and lower boundaries for expected variation in a process.

****Acceptance sampling:**** A statistical quality control method where a sample is taken from a batch of products to determine if the batch meets the required quality standards.

****Acid test ratio:**** A financial ratio used to assess a company's short-term liquidity by dividing its quick assets by its current liabilities.

****Activity-based costing (ABC):**** A costing method that allocates overhead costs to products or services based on the activities required to produce them.

****Affinity diagram:**** A tool used in root cause analysis to organize and cluster ideas or data into related groups.

****Agile:**** A project management approach that values flexibility, collaboration, and continuous improvement.

****Alpha error:**** The probability of rejecting a true hypothesis in statistical testing.

**** Alternative hypothesis:**** The hypothesis that is tested against the null hypothesis in statistical testing. It represents the researcher's belief about the population parameter.

****Anova (Analysis of Variance):**** A statistical technique used to compare the means of two or more groups.

****Aroot cause analysis (ARCA):**** A systematic approach to identifying the underlying causes of problems or incidents.

****Balanced scorecard:**** A strategic management tool that measures a company's performance in four perspectives: financial, customer, internal processes, and learning and growth.

****Bar chart:**** A graphical representation of data using bars of equal width to depict the frequency or magnitude of different categories.

****Basic cause:**** A fundamental issue that underlies a problem or incident.

****Bayes' theorem:**** A mathematical formula used to calculate conditional probabilities.

****Benchmarking:**** A process of comparing a company's performance to that of other organizations or

industry best practices.

****Beta error:**** The probability of failing to reject a false hypothesis in statistical testing.

****Brainstorming:**** A creative problem-solving technique that involves generating a large number of ideas in a short amount of time.

****Business process management (BPM):**** A discipline that combines methods, techniques, and tools to discover, model, analyze, measure, improve, optimize, and automate business processes.

****Capability maturity model (CMM):**** A framework for evaluating the maturity of an organization's software development processes.

****Cause-and-effect diagram:**** A visual tool used in root cause analysis to identify the relationships between causes and effects.

****Central limit theorem:**** A statistical principle that states that the distribution of sample means approaches a normal distribution as the sample size increases.

****Change management:**** A structured approach to managing changes to a system, process, or organization.

****Check sheet:**** A simple data collection tool used to record the frequency of events.

****Chi-square distribution:**** A continuous probability distribution used in statistical testing.

****Chi-square test:**** A statistical test used to determine if there is a significant association between two categorical variables.

****Closed-loop corrective action (CLCA):**** A systematic approach to corrective action that includes verification and validation of the solution.

****Cohen's d:**** A statistical measure used to quantify the effect size in a hypothesis test.

****Common cause:**** A factor that contributes to variation in a process that is inherent and expected.

****Confidence level:**** The probability that the true population parameter falls within a certain range of values.

****Confidence interval:**** A range of values that is likely to contain the true population parameter with a certain level of confidence.

****Confirmation bias:**** The tendency to seek out information that confirms pre-existing beliefs and ignore information that contradicts them.

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- **Control chart:**** A graphical tool used to monitor and control a process over time.
- **Control limit:**** A boundary line on a control chart that indicates whether a process is in control or out of control.
- **Correlation:**** A statistical relationship between two variables that measures the degree to which they move together.
- **Correlation coefficient:**** A numerical value that measures the strength and direction of a correlation.
- **Cost of quality (COQ):**** The total cost of poor quality, including prevention, appraisal, and failure costs.
- **Critical to quality (CTQ):**** A characteristic of a product or service that is essential to its quality.
- **Data mining:**** The process of discovering patterns and insights in large datasets.
- **Defect:**** A non-conformance in a product or service that does not meet the required specifications.
- **Defect density:**** The number of defects per unit of measure, such as defects per thousand lines of code.
- **Defect per opportunity (DPO):**** The number of defects per unit of measure, adjusted for the number of opportunities for defects.
- **Defect rate:**** The percentage of units produced that contain one or more defects.
- **Deming cycle (PDCA):**** A continuous improvement model consisting of four stages: Plan, Do, Check, Act.
- **Descriptive statistics:**** Statistical methods used to describe and summarize data.
- **Design of experiments (DOE):**** A statistical method used to optimize processes or products by systematically varying input factors.
- **Detective control:**** A control that identifies and corrects defects after they have occurred.
- **Discriminant analysis:**** A statistical technique used to classify observations into one of two or more categories.
- **Distribution:**** A pattern of variation in a population or sample.
- **Drill-down analysis:**** A process of examining data at increasingly detailed levels.
- **Efficiency:**** The ratio of output to input.
- **Empirical rule:**** A rule of thumb that states that in a normal distribution, 68% of the data falls within one standard deviation of the mean, 95% falls within two standard deviations, and 99.7% falls within three standard deviations.
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- **Event tree analysis (ETA):**** A technique used to analyze the possible outcomes of a sequence of events.
- **Experimental design:**** A plan for conducting an experiment that specifies the input factors, levels, and response variables.
- **Exploratory data analysis (EDA):**** A statistical approach to data analysis that involves visualizing and summarizing data to identify patterns and relationships.
- **Failure mode and effects analysis (FMEA):**** A systematic method for identifying and prioritizing potential failures in a system or process.
- **Failure rate:**** The number of failures per unit of time or per unit of measure.
- **Fault tree analysis (FTA):**** A technique used to analyze the possible causes of a single event.
- **Fishbone diagram:**** A visual tool used in root cause analysis to identify the possible causes of a problem.
- **Five Whys:**** A root cause analysis technique that involves asking "Why?" five times to get to the root cause.
- **Force field analysis:**** A tool used to identify the forces for and against a proposed change.
- **Frequency distribution:**** A table that shows the frequency of each value in a dataset.
- **Functional control:**** A control that prevents defects from occurring in the first place.
- **Gaussian distribution:**** Another name for the normal distribution.
- **Gantt chart:**** A graphical representation of a project schedule.
- **Gemba:**** A Japanese term meaning "the actual place." In root cause analysis, it refers to going to the place where the problem occurred to gather data.
- **Hazard analysis and critical control points (HACCP):**** A systematic approach to identifying and controlling hazards in a food production process.
- **Histogram:**** A graphical representation of data using bars of equal width to depict the frequency of different values.
- **Hypothesis testing:**** A statistical technique used to test a hypothesis about a population parameter.
- **Incident investigation:**** A process of determining the causes of an incident or accident.
- **Inferential statistics:**** Statistical methods used to make inferences about a population based on a sample.
- **Input-process-output (IPO) model:**** A model used to analyze processes by identifying the inputs,
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processes, and outputs.

****Interquartile range (IQR):**** A measure of the spread of a dataset that excludes the top and bottom 25% of values.

****Interval scale:**** A level of measurement that has equal intervals between values but no true zero point.

****Just-in-time (JIT):**** A production system that aims to minimize inventory by producing products only when they are needed.

****Kaizen:**** A Japanese term meaning "continuous improvement."

****Kano model:**** A model used to classify customer requirements into three categories: must-haves, performance factors, and delighters.

****Kurtosis:**** A measure of the peakedness of a distribution.

****Lead time:**** The time