Design Document: Troubleshooting Skills in Semiconductor Manufacturing

Business Purpose	X Company is committed to fulfill a service contract to its customer, Y Company. The service contract stipulates that X Company must ensure uptime of semiconductor equipment is greater than 93% to avoid financial penalties. The purpose of this training is to improve troubleshooting skills of Field Service Engineers (FSEs) to meet or exceed the uptime goal of 93%. This training prepares FSEs in the semiconductor industry to troubleshoot complex manufacturing problems. Successful front-line troubleshooting ultimately leads to reduced equipment downtime, minimized escalations to advanced support, and positive effects on the bottom line.
Target Audience	Junior FSEs with little to no troubleshooting experience, geographically distributed across different countries/times zones
Training Time	20 minutes
Training Recommendation	1 training module developed in Articulate Rise • Self-paced and responsive on different devices • Ease of use for geographically disbursed audience • Agile for content updates • Job aids for quick reference

Deliverables	• 1 Rise course, including:
	  • Scenario-based learning woven throughout module
	  • Interactive troubleshooting process flowchart developed in Articulate Storyline
	  • Elearning Assessment
	  o Knowledge checks
	  o Final Quiz
	  • 2 downloadable Job Aids
	  o Troubleshooting Process Flow Chart PDF
	  o Action Plan Considerations Infographic PDF

Learning Objectives	After this training, FSEs will be able to: • Outline the steps of the troubleshooting process. • Identify the elements of a detailed problem statement. • Explain how to develop an action plan. • Describe the components of a post-mortem.

Training Outline	• Course Introduction
	  o Learning Objectives
	• Overview of Troubleshooting Process
	  o Troubleshooting Process Flow Chart
	  ▪ Create and/or confirm the problem statement.

- Create a problem statement.
  - Confirm the initial problem statement, if one is already written.
  - May need to rewrite the problem statement after gathering more information during the investigation phase.
- Confirm the tool conditions.
  - Confirm the tool conditions:
  - What is the abnormality?
  - When, where, and for how long has the problem occurred?
  - What is the impact?
  - What is the urgency?
- Analyze applicable data.
  - Analyze:
  - Current knowledge of the problem
  - Physical observation
  - Any relevant data logs.
- Determine the model.
  - Determine which model(s) are involved in the issue to create the action plan.
- Create the action plan(s).
  - Write the action plans(s), based on the models previously identified.
- Execute the action plan(s).
  - Implement or execute the action plan.
  - Now you get to try to fix the problem!
- Confirm the action plan(s) results.
  - Confirm whether the action plan resolved the issue by direct observation and analyzing the data again.
- If needed, develop new action plans.
  - Was the criteria met? Inform the appropriate parties of the results.
  - If the criteria was not met, create and/or implement new action plans.
- Write a post-mortem.

- Knowledge Check
- Phase 1: Investigation
  - Scenario: Investigating a Tool Issue
  - Scenario: Confirming the Problem Statement and the Tool Conditions
  - Analyze Applicable Data
  - Knowledge Check
- Phase 2: Action Plan
  - Scenario: Determining the Model
  - Action Plan Considerations
  - Scenario: Executing the Action Plan and Confirming the Action Plan Results
  - Knowledge Check
- Phase 3: Post-Mortem
  - Elements of a Post-Mortem
  - Scenario: Writing a Post-Mortem
  - Knowledge Check
- Assessment:
  - 5 graded questions of varied type, each assessing a different learning objective
    - (LO1: Outline the steps of the troubleshooting process.) Match the step number with its corresponding step in the troubleshooting process.
    - (LO2: Identify the elements of a detailed problem statement.) Choose the best response(s) to the question. There may be more than one correct response. What are some elements of a detailed problem statement?
    - (LO2: Identify the elements of a detailed problem statement.) Which of the following questions are necessary to answer to create an accurate, detailed problem statement? Select all that apply.
    - (LO3: Explain how to develop an action plan.) Select the best answer to the question. What must be determined before developing an action plan?
    - (LO4: Describe the components of a post-mortem.) What are the main components of a post-mortem? Choose the best answer.
  - Allows unlimited attempts

	• Summary Through examining the phases and steps of the troubleshooting flow chart and experiencing a real-life troubleshooting scenario, you can now apply the troubleshooting skills you have learned to solve complex tool issues in the fab. • Course Completion: congratulations
Assessment Plan	• Ungraded knowledge checks with feedback after each main topic • Graded final quiz with feedback after quiz o Questions of varied type aligned with learning objectives o Must score 80% or better to pass; unlimited attempts