

Millstone Power Station

Troubleshooting Training Evaluation



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Summary

Paragraph 1

Begin this section with a brief discussion of the issue history. The first paragraph will include a reference to the WANO AFI (Area For Improvement) and the PAPII (Performance Analysis, Performance Improvement Instrument) which was performed as a direct result of the AFI's Corrective Action. (Copy of PAPII to be attached as an Appendix) Also in this paragraph include the Terminal Objective for the course from the lesson plan. (Lesson Plan to be attached as well)

Terminal Objective

Upon completion of the training learners will be able to explain the Simple Troubleshooting Process and use that knowledge to participate as a member of simple and complex troubleshooting teams

Paragraph 2 & 3

The purpose of the report is to validate the effectiveness of Troubleshooting Training based on closing the performance gaps observed in station troubleshooting. (i.e. rework, ineffective corrective actions) Major steps:

1. Direct Observation of Troubleshooting Team's effectiveness
2. Analysis of troubleshooting efforts during previous 6 months versus those 3 months after completion of training
3. Analysis of Equipment Reliability Key Performance Indicators

Paragraph 4

Summation of Evaluation Findings

Description of Program

Describe the Engineering Department Demographics. Include history of an aging workforce and the loss of experience. Cite statistics of department turnover (10 percent in the last 4 years, 20 percent projected in the next 5 years for a total of 1/3 of the department being replaced in a 10 year time frame.

Describe the initial and continuing training programs to provide context, including the decision of the Curriculum Review Committee to increase the duration of the class from 3 hours to 10.

Program Objectives

The objectives of the program are designed to step each learner through the troubleshooting process while at the same time reinforcing station Human Performance Standards. One important distinction should be noted. The purpose of the program is not to create technicians, that is to say, field personnel. While engineers may be present in the field, they will not be physically performing the work.

1. Given a list of plant conditions, generate a troubleshooting problem statement.
2. Given plant diagrams, identify monitoring points to be used for the system elaboration portion of the Six Step Troubleshooting process.
3. Analyze plant diagrams to develop a troubleshooting plan
4. State how the good decision making model applies to plant troubleshooting.
5. Identify Red Flag and Green Flag behaviors within the troubleshooting process.
6. State the purpose of the following plant test equipment:
 - Multimeter
 - Megger
 - Astromed
7. Analyze plant diagrams to determine the correct values of parameters at a given test point.
8. Explain the importance of failure analysis in the troubleshooting process.

Program Components

Briefly describe the following components from the lesson:

Power Point Presentation

Student Handouts (Narrative, Red Flag/Green Flag Behaviors, MA-AA-103, Conduct of Troubleshooting procedure, Decision Making Model)

Student Exercises (Both in body exercises and student evaluation)

Evaluation Method

EO1 – Create a grading scale based on the content of the problem statement

EO2 – Review Troubleshooting Plans created before and after training. Compare plans to P&ID drawings to create a percentage based system. (i.e. if there are 10 monitoring points available in the system and the team only identified 8 of them, this is a result of 80%)

EO3 – Review Troubleshooting Plans created before and after training. Analyze plans for redundant and omitted readings. Is the plan following a logical progression or is the team “Easter Egging” (taking readings just to take readings)

EO4 & 5 – Evaluate based on direct observation of Troubleshooting Teams. Are team members holding each other accountable to demonstrate good decision making and green flag behaviors?

EO6 & 7– Review Troubleshooting Plans created before and after training. Is the proper equipment being called out in the Troubleshooting Plan? Is the correct scale being specified? Are expected values listed? Are they correct? This will be a percentage based on the readings that are being taken.

EO3 – Review Troubleshooting Work Orders created before and after training. Review the number of post-job critiques. Is a failure analysis included in the Work Order?

Participants

Paragraph 1

Include a description of the Engineering Department and how Troubleshooting teams are assembled.

Paragraph 2

Include a description of the Operations/Maintenance/Engineering interface during the troubleshooting process.

Procedures

Include a detailed description of the processes used.

Data Sources

Include a blank troubleshooting plan as an appendix. Make sure to describe what 4.0 looks like.

Use the job observation sheet to evaluate troubleshooting teams. Include a copy as an appendix

Results

First paragraph should be the bottom line result. Are the things we are fixing staying fixed. I need to discuss Equipment Reliability KPIs with the Engineering DCAC. This is a hard data point for the overall effectiveness of the training.

Data can be displayed on a double bar graph for the appropriate Enabling Objective. The X axis will be the objective and the Y axis will be a percentage. Ensure a sample size for each objective is included in the text.

Discussion

To be written based on evaluation.

Appendices

Program: Engineering Troubleshooting Training

Summative Evaluation

Evaluator: Jim Doran

Evaluation Question	Activities to Observe	Data Source	Population Sample Design	Data Collection	Responsibility	Data Analysis	Audience
Has Troubleshooting Training improved team performance at Millstone such that it has obtained the goal of zero recurring failures of repaired equipment?	10 Hour Troubleshooting Course	Equipment Reliability KPIs	Random Engineering Personnel	Post Training	Engineering DCAC	Evaluator	Director, Site Operations Director Site Engineering Manager, Nuclear Training
Does the Engineering Department create detailed problem statements based on the facts presented?	Identify the Problem Class Exercise	Troubleshooting Plans	Random Engineering Personnel	Post Training	Evaluator	Evaluator	Director Site Engineering Manager, Nuclear Training
Can Engineering Department personnel use plant drawings to identify in-plant monitoring points to be used to gather initial troubleshooting evidence?	P & ID Print Exercise	Troubleshooting Plans	Random Engineering Personnel	Pre Training / Post Training	Evaluator	Evaluator	Director Site Engineering Manager, Nuclear Training
Do Troubleshooting Plans reflect a thorough analysis of plant drawings and present the least amount of risk possible to the plant?	Evaluated Troubleshooting Exercise	Troubleshooting Plans	Random Engineering Personnel	Pre Training / Post Training	Evaluator	Evaluator	Director, Site Operations Director Site Engineering Manager, Nuclear Training
Are Troubleshooting Teams modeling site standards with regards to decision making and red/green flag behaviors?	Discussion of Decision Model and Red/Green Flag Behaviors	Direct Observation of Troubleshooting Teams	Random Engineering Personnel	Post Training	Evaluator	Evaluator	Director, Site Operations Director Site Engineering Manager, Nuclear Training
Is the correct test equipment being used to monitor plant parameters and are the appropriate scales being selected?	M & TE Discussion and Demonstration	Troubleshooting Plans	Random Engineering Personnel	Pre Training / Post Training	Evaluator	Evaluator	Director Site Engineering Manager, Nuclear Training
Do Engineers use the correct expected values when developing a troubleshooting plan?	Evaluated Troubleshooting Exercise	Troubleshooting Plans	Random Engineering Personnel	Pre Training / Post Training	Evaluator	Evaluator	Director Site Engineering Manager, Nuclear Training
Are Troubleshooting Teams performing thorough Post Job Critiques and do Work Orders include the appropriate failure analysis?	Failure Analysis Discussion	Troubleshooting Work Orders	Random Engineering Personnel	Post Training	Evaluator	Evaluator	Director, Site Operations Director Site Engineering Manager, Nuclear Training

Website Extra Credit.

<http://evaluationtoolbox.net.au/>

Evaluationtoolbox.net from Australia is a one stop shop for evaluators. Experience evaluators and novices alike can benefit from the information presented by the website. It offers tools for planning and conducting evaluations as well templates and models for presenting evaluation results. Additionally, it presents a number of case studies and sample evaluations covering a wide variety of subjects. The site is easy to navigate and available in a number of different languages. Pacific Research and Evaluation Associates (PREA), a firm specializing in project design, project evaluation, training and facilitation maintains the website which was created under the Victorian Local Sustainability Accord, a state funded project of Victoria, Australia.

HOTS Assignment

Busytown, Montana has a single elementary school, K-5 with a student population of 150. Recently Fallguy McJug, a local resident, won the Lucky Ball Lottery and donated \$10,000 to the school district for the purchase of technology products.

Busytown Fact:

87% of all residents have computer/Hi-Speed internet access

Busytown Elementary Facts:

School Wired for Hi-Speed Internet: Yes

Wi-Fi Available: No

Classrooms with computers: 1 Pentium 5/Windows 95 computer in the fifth grade classroom

Links to Available Products

[Smartboard](#)

[Laptop](#)

[Desktop](#)

[Tablet](#)

[Chromebook](#)

Given the information above, develop a formative evaluation plan to determine how to spend Fallguy's generous gift.