THE PROBLEM SOLVING
8D methodology
Training plan

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Introduction

In any business firm or other organizations appear some problems, sometimes they are easy to remove and sometimes it seems that the solution is not possible.

When problems occurred, run the proper action to eliminate the problem. However, often it turns out that the same problem appears again and usually in the most difficult moments - shipments to the customer.

If the problem appeared again it indicates that the real cause is not resolved but only "heal" the problem temporarily, and his crux "cause" is not resolved.

Sometimes the reason is defined the cause of the problem incorrect, and sometimes a lack of consequence in implementing such corrective action to prevent the same problem again appeared.
Introduction

To ensure a systematic and orderly way of solution to the problems, and their easy recorded is recommended widely known in the automobile market.

THE PROBLEM SOLVING
8D

Advantages:

1. Easy and logically method, clearly shows Next steps of problem solution.

2. The method is known and used by all companies from the automotive industry.

3. Often this is a required method of documenting the correction action for the customer.

4. An excellent way of reporting nonconformance’s to suppliers and their corrective actions.
8D History

8D methodology despite what is generally thought has not been created by Ford but by the U.S. Department of Defense (DoD) in 1974. The standard, which described 8D was named:

„MIL-STD 1520 Corrective Action and Disposition System for Nonconforming Material”

Standard was officially abolished in 1995, but the 8D methodology has been propagated by Ford on automotive industry and is well known to many companies in the electronics industry.
8D idea

The basic idea of 8D is correctly identified **the cause of the problem**, and applied such actions **to prevent recurrence of the problem**.

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<th>Step</th>
<th>Description</th>
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<td><strong>PROBLEM</strong></td>
<td>The problem is detected by for example staff / quality control / customer</td>
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<td>1D ESTABLISHING THE TEAM</td>
<td>Establish the team (from 2 to 10 persons) from different departments and choose team’s leader</td>
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<td>2D PROBLEM DESCRIPTION</td>
<td>Exactly describe the problem in order to understand what went badly</td>
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<td>3D CONTAINMENT ACTION</td>
<td>Stop the process, for example, introducing 100% inspection, retest, return from the customer</td>
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<td>4D ROOT CAUSE</td>
<td>Establish the actual cause of the problem and why it wasn’t detected previously</td>
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<td>5D CORRECTIVE ACTION</td>
<td>Establish and introduce proper corrective actions</td>
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<td>6D VALIDATE CORRECTIVE A.</td>
<td>Validate whether corrective actions are efficiently, problem is monitored</td>
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<td>7D PREVENT RECURRENCE</td>
<td>Determine and introduce „structural“ action to Prevent reoccurrence</td>
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<td>8D VERIFY AND CONGRATULATE TEAM</td>
<td>Verify introduced action in 7D and close the action, dissolution the team</td>
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1D ESTABLISHING THE TEAM

First step is establish the team consists of few persons, that will be responsibility for realized particular step of 8D. Quantity of team and their making-up depends of complexion of the problem and taken decision.

The team should fulfil the following steps:

• Have a good knowledge of the product and processes.

• Multidisciplinary – that’s mean person with different department:
  • Engineers (designers)
  • Technologists (production)
  • Rework operator, production staffs (often have the biggest experience)
  • Quality Engineers
  • Buyers
  • Others

• Have adequate capability to introduce proper solution of the problem.

• The team should have a Leader, who supervises and closes 8D.
2D Problem description

This is the stage where you need to most accurately describe the problem. Properly problem description is the starting point to further step of analysis and proper understanding of the nature of the problem for the Team as well as people from outside.

It’s recommend that description of the problem include:

• Properly described the problem. Not restricted to laconic statements.
• Place problem detected.
• Scale of problem, eg. % of reject or qty of pcs / range deviations beyond the tolerance etc.

It’s very important that problem was „measurable” that is how many % or ppm or in another unit of measure.
Later this allows to properly assess whether corrective actions are implemented efficiently or not.
3D Containment action

This is the stage where are taken right containment action to prevent escalation of the problem (further making defects) or at the worst delivering not conforming products to the customer.

Example of action:

• Stoppage of production / shipment
• Segregation goods on OK / NOK
• Additional visual control
• Informing the Customer about the problem (for verification of the goods at the Custom.)
• Informing operators about the problem

Check if similar products or processes, there is a similar risk (if yes - should be implemented the containment action)
4D Root Cause

To really eliminate the problem should be identify the real cause of the problem "root cause". This is not a simple issue. This is why it is important the Team’s work to look at the problem with few sites. Often the real causes of many problems are deep in the management of the company.

The production process often throws up the cause of the problem on "operator error". It is a mistake. The reasons are much deeper:

• Lack of properly tools.

• Lack of training or training aren’t efficient.

• Overtime work in hurry (effect of wrong decisions of the management).

• The production process is not suitable for quality requirements.

• The others.
Define the cause of the problem using **5-WHY methodology (WHY 5 times)**

**Cause:** A lot of short circuit on connector’s legs on PCB (after wave soldering)

1-WHY: Why problem occurred?
To less flux putting on pcbca surfcase (that was the root cause of short circuits).

2-WHY: Why problem occurred?
Wave soldering machine adjustment (flux amount) incorrect set up.

3-WHY: Why problem occurred?
Operator / Technologist didn’t know how process improvement.

4-WHY: Why problem occurred?
Operator / Technoloist training is inncorect (no efficiently ).

5-WHY: Why problem occurred?
No standard training material and no trainer to assure high level of Operators / Technologists knowledge.
4D Root Cause

If we identify the cause of the problem correctly then "eliminate" the root cause allows to really solve the problem and often many others

- LIFTED COMPONENTS
- SHORT CIRCUIT
- NO SOLDER JOINT
- STRESS
- SOLDER CONTAMINATION
- WASTE OF TIME
- CUSTOMER DISSATISFACTION

CAUSE:
NO TRAINING MATERIALS AND TRAINER FOR TRAINED WAVE SOLDERING OPERATOR AND PROCESS ENGINEER
5D Corrective action

The Team determine which actions should be introduced in the short period of time to ensure that the process / product is controlled.

Examples:

- Introducing additional control in process
- Introducing additional other process (eg. component reworked, test corrected)
- Rework defective units found inside
- Rework units returned from Customer
- Inform the Supplier about defective part delivered and their Exchange, etc.
6D Validate corrective action

Please verify that the corrective actions taken are efficiently. It should be based on "real data" from the process. Action should not be estimated on the basis of only the same opinion of the persons interested

Examples:

• Less reject % (ppm) in process.

• Test / control results shows improvement.

• Engineering’s measurements (dimension, units appearance) are correct (according to tolerance, specification).

• Other proofs shows on Introducing corrective action.

• Supplier delivers goods of better quality.
7D Prevent recurrence

Next step is to determine what action should be taken to prevent recurrence of the problem. Here we define the action system to replace the actions defined in 5D.

Examples:

- Modified or make proper jig (tooling).
- Changing the process parameters in order to prevent defects.
- Changing process / tools by Supplier which make parts.
- Changing procedures (organization change).
- Changing documentation / specification (if was incorrect).
- Preparing systematic and full training for staff.
8D Verify and congratulate Team

The last step is verified that the introduced actions in 7D are effective. It is recommended that verification be made by comparing the scale of the problem (as described in 2D) with results from next deliveries of material or results from rejecting of next batches.

The verification must be based on that measurable data.

**Leader of the Team is made verification**

During the verification it is worth to draw conclusions as the Team worked, what the individual members have learned and what are the conclusions for future - what can be improved on problem solving, etc.
Thank you for your attention