# Procedure / Verfahrensanweisung
## Supplier Corrective Action

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## Content

In this procedure, the following verbal forms are used:

- “shall” indicates a requirement;
- “should” indicates a recommendation;
- “may” indicates a permission;
- “can” indicates a possibility or capability;

Content of this document modified compared to the last valid and released version is marked in blue/italic.

*This is an example for changed content.*

# 1 Purpose and Scope

This procedure describes the way of communication and customer ´s requirements on supplier to solve supplier related defects / nonconformities, to revert to conformity of delivered products as well as preventing the re-occurrence of these defects / nonconformities by eliminating the root cause.
Customer will issue a SCAR to the supplier requesting a documented CAPA process to get the defect / nonconformity solved. Supplier shall follow the requirements in this procedure. This procedure is valid for the whole SMA group as well as all suppliers supplying products to companies of SMA group.

This procedure is administrated by SMA ´s Global Supplier Quality Manager.

# 2 Terms and Abbreviations

| | |
|---|---|
| **8D** | **8 D**isciplines; problem solving method |
| **Audit** | Systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled |
| **CAPA** | **C**orrective **A**ction **P**reventive **A**ction; process to solve a nonconformity |
| **CAR** | **C**orrective **A**ction **R**eport; Report from supplier towards customer to respond on a SCAR with the result of supplier ´s CAPA process with root cause, containment action, corrective action and preventive action |
| **Corrective action** | Action to eliminate the cause of a detected nonconformity or defect or other undesirable situation |
| **Customer** | For the purpose of this procedure “customer” is SMA group |
| **Defect** | Non-fulfillment of a requirement related to an intended or specified use |
| **Nonconformity** | Non-fulfillment of a requirement |
| **Objective evidence** | Data supporting the existence or verity of something |
| **Preventive action** | Action to eliminate the cause of a potential nonconformity or defect or other undesirable potential situation |
| **Product** | For the purpose of this procedure a “product” covers products and services supplied to SMA group |
| **Repair** | Action on a nonconforming or defective product to make it acceptable for the intended use |
| **Rework** | Action on a nonconforming product to make it conform to the requirements |
| **SCAR** | **S**upplier **C**orrective **A**ction **R**equest; formula issued from customer to start a CAPA process at supplier according to method requested |
| **Supplier** | For the purpose of this procedure “supplier” is supplier of SMA Group |
| **Sub-Supplier** | For the purpose of this procedure “sub-supplier” is the whole supply chain of supplier |
| **Validation** | Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled |
| **Verification** | Confirmation, through the provision of objective evidence that specified |

requirements have been fulfilled

# 3 Obliged documents

These documents are available on customer ´s supplier portal via Internet:

GSQ – 001 8D Report Template

GSQ – 002 Corrective Action Report Template

QSQ – 003 Supplier Corrective Action Request Template

GSQ – 004 This document (Supplier Corrective Action Procedure)

GSQ – 005 Identification label certified products after complaint

# 4 Links

RAPEX Guideline http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32010D0015

SMA Supplier Portal http://www.sma.de/en/partners/supplier.html

# 5 SCAR

## 5.1 Raising a SCAR

Customer will request a Supplier Corrective Action with customer ´s format GSQ – 003 – SCAR Template. The requested method (CAR or 8D) shall be followed from supplier (and is described in sections 6 “CAR” and 7 “8D”. Timelines from customer (section 5.3 Timelines to be met) needs to be respected from supplier.
All reports and written information need to be sent to customer Supplier Quality contact given in the issued SCAR.

## 5.2 Decision matrix for raising a SCAR

A SCAR will be raised according to “occurrence” of the issue and “effect on customer” (including end-customers) according to the matrix below. The matrix is a guideline. Independent from the matrix customer has the possibility to raise a SCAR in case of a necessary reason seen, e.g. but not limited to re-occurrence of a defect/nonconformity, probability of systematic or methodic errors, probability of high risks, etc.

| | |
|---|---|
| Care | **regularly no SCAR** will be requested, SCAR with CAR can be requested |
| Caution | **SCAR request,** method to be used is CAR, an 8D can be requested |
| Alert<br>Stop | **SCAR request,** method to be used is 8D |

| Decision Matrix | | Customer effect | | | | |
|---|---|---|---|---|---|---|
| | | **Marginal** | **Low** | **Moderate** | **High** | **Very High** |
| **Occurrence** | **Very Likely** | Caution | Alert | Alert | Stop | Stop |
| | **Likely** | Caution | Caution | Alert | Alert | Stop |
| | **Possible** | Care | Caution | Caution | Alert | Alert |
| | **Unlikely** | Care | Care | Caution | Caution | Alert |
| | **Very Unlikely** | Care | Care | Care | Caution | Caution |

**Customer effect**

| | |
|---|---|
| Marginal | No effect on customer and / or following production process |
| Low | Minor effect on customer (no effect in production, only visual / haptic influence) and / or minor effect on following processes. Rework needed (workload < 15 min); no effect on end-customer |
| Moderate | Major effect on customer. Major effect on following processes. Rework needed to correct the defect (workload > 15 min); no effect on end-customer |
| High | Critical effect on customer, causes an unexpected product or system maintenance and / or stops production for more than half a shift, problem can impact end-customer |
| Very High | Safety critical effect, causes an unexpected breakdown of product or system or hazard to life of persons and / or stops production for more than half a shift, problem impacts end-customer |

**Occurrence (dedicated to same failure pattern)**

| | |
|---|---|
| Very Unlikely | First time event (single piece failure) |
| Unlikely | Occurs the second time within 6 months (single piece failure occurred in min. twice within this timeframe) |
| Possible | Occurs the second time within 1 month (single piece failure occurred in min. twice within this timeframe) |
| Likely | Occurs the second time within 2 weeks (single piece failure occurred in min. twice within this timeframe) |

| | |
|---|---|
| Very Likely | > 5 defects / nonconformities within 1 month (systematic failure, more than 5 defects / nonconformities) |

**Important!**
**In case that the identified failure pattern indicates hazard to persons (danger to life and health, injury of persons) 8D method to solve the defect / nonconformity is mandatory independent from the decision matrix! In addition to the 8D report a RAPEX risk assessment according to "Guidelines for the management of the Community Rapid Information System RAPEX", PART IV APPENDICES, chapter 5 or a risk assessment according to a similar method is obligatory to evaluate the risk emanating from the defect / nonconformity. The risk assessment shall be sent together with the 1st level 8D Report within 1 working day after SCAR was requested.**

## 5.3 Timelines to be met

Supplier shall respond to a *CAR or 8D* (required content: reference to customers SCAR and defined containment action(s)) within *next business* day after the SCAR was issued to supplier.

The final CAR or 8D shall be sent to customer no longer than 1 month after the SCAR was issued to supplier *if customer has not defined a different timeframe.*

In case of 8D supplier shall send *an update* of the 8D report to customer *by request or if the 8D content has significantly changed*.

Supplier shall inform customer´s supplier quality department immediately if the defined timelines could not be met due to complexity of the problem. Extended timelines need to be confirmed from customer.

Customer´s supplier quality department will track the results and timelines to get suppliers defect / non-conformity solved and to prevent reoccurrence of the defect / nonconformity issued within the SCAR.

In case of serious matters customer´s quality department will request phone calls or meetings on a regular basis to follow-up the actions. A customer audit at supplier site to verify the sustainable solution can be performed from customer.

## 5.4 Closure of SCAR

The supplier corrective action is closed once customer approved the documents and confirmed the closure of the SCAR to supplier.

# 6 CAR

## 6.1 General description and requirements

If customer requests a CAR the supplier is free to use suitable CAPA methods at his own choice useful to solve the described issue in the SCAR. Supplier needs to report back the result of the CAPA process in a timely manner using customers CAR format (GSQ – 002 Corrective Action Report Template) or a format of his own with at minimum the same content of customers CAR format (at least: reference to customers SCAR, root cause, containment action(s), corrective action(s), preventive measure(s) and date of effective implementation).

## 6.2 Containment actions

Supplier shall identify solutions to temporary contain the issue that no more defect / non-conform products reaching the customer. Containment actions could be e.g. a 100% outgoing check or in

process check, sorting at customer site, rework, repair, etc.
Products shipped to customer during containment action phase (corrective action isn´t implemented yet) needs to be marked clearly outside of packaging boxes with label “GSQ-005 Identification label certified products after complaint”. The containment action (short term solution) should be quick, easy to implement and worth the effort. Communicate the containment action with a 1st level CAR to customer. Date of effective implementation needs to be written down in the CAR. A delimitation of affected product lots, serial numbers, deliveries or similar shall be given.

## 6.3 Root Cause

The root cause needs to be discovered to later on identify and implement effective corrective and preventive actions. Supplier shall write in detail which root cause caused the defect / nonconformity. Suitable methods shall be used to identify the root cause (refer to 8D method). Date of identification of root cause needs to be written down in the CAR.

## 6.4 Corrective actions

At a first glance, actions like training of people, to sensitize employees, etc. will never solve a root cause. Therefore, those actions are no suitable corrective actions and won´t be accepted from customer as a valid counter measure. A corrective action needs solve the identified root cause(s) and prevent the re-occurrence of the described issue in the future. Define and implement suitable corrective actions. An objective evidence about the effectiveness shall be given in the CAR as well as date of implementation.

## 6.5 Preventive actions

Define and implement suitable preventive actions for other (similar) products, processes, etc. may have the same weakness or be potentially affected. Date of effective implementation needs to be written down in the CAR.

# 7 8D

## 7.1 Requirements

If customer requests an 8D the supplier is requested to follow 8D method described in this section to solve the described issue in the SCAR. Supplier shall report back the result of the 8D process in a timely manner using customers 8D report format or an 8D format of his own with at minimum the same content of customers 8D format (at least: all 8D fields with responsibilities and date of definition / implementation).

## 7.2 General description

The 8D method is a problem solving process for product and process issues. It is structured into 8 steps (the D´s) with emphasis on a team. The basic steps are: Build a team, describe the issue, define containment actions, identify root cause, define and implement corrective actions as well as preventive actions and finally congratulate and reward the team. To use the 8D method, address each of the disciplines listed below, in order. Do not skip steps, even when time is limited. The method is effective only when every step is followed and performed.

8D is shortcut for Eight Disciplines, they are:

D1 Establish / Build the team

D2 Define / Describe the issue or problem

D3 Define and implement a containment action

D4 Identify and verify the root cause

D5 Define and verify corrective actions

D6 Implement and validate corrective actions

D7 Identify and implement preventative measures

D8 Congratulate the team

## 7.3 Discipline 1: Establish / build the team

Before a team is assembled to address the issue to, the approach needs to be planned. This means spending time and thinking about who will be on the team and why (who is needed with which abilities and/or skills), what is the time frame and what resources are needed to address and solve the issue in a timely manner.

Install a team that has skills needed to solve the addressed issue and has the time to commit on the problem solving process. A diverse team is more likely to find a solution than a team of people with the same outlook however, if outlooks are too diverse, people can spend too much time disagreeing that nothing gets done.

Create a team charter that outlines the team´s goal and identifies each person´s role.

## 7.4 Discipline 2: Define / describe the issue or problem

Describe the issue or problem in detail. Specify the „who“, „what“, „when“, „where“, „how“ as well as „how many“ and use techniques like the Problem-Definition process to ensure that you´re focusing on the right problem. Basis for the problem description is the SCAR issued from customer. The problem description in the 8D report shall not be a copy from customer´s SCAR formula, describe the problem on your own and add the additional information on hand from supplier point of view.

## 7.5 Discipline 3: Containment actions

Once the problem is understood, supplier shall identify solutions to temporary contain the issue that no more defect / non-conform products reaching the customer. Containment actions could be e.g. a 100% outgoing check or in process check, sorting at customer site, rework, repair, etc. Harness the knowledge of everyone on the team, involve additional persons if necessary. To ensure that each person ´s ideas are heard, consider using brainstorming techniques.
Once the team has identified possible temporary fixes address issues such as implementation time and relevancy. Products shipped to customer during containment action phase (corrective action isn ´t implemented yet) needs to be marked clearly outside of packaging boxes with label "GSQ-005 Identification label certified products after complaint". The containment action (short term solution) should be quick, easy to implement and worth the effort. Communicate the actual status with a 1st level 8D report to customer. A delimitation of affected product lots, serial numbers, deliveries or similar shall be given.

## 7.6 Discipline 4: Identify and verify root cause

In this step the root cause needs to be discovered to later on identify and implement effective corrective and preventive actions. To discover the root cause during the 8D method a cause and effect analysis (also known as Ishikawa diagram or Fishbone diagram) shall be performed. This tool is useful because it helps uncover many possible causes and it can highlight other problems that might not been visible yet. To drill down to the root cause a 5 Why analysis shall be performed. Both information – the Fishbone diagram and the 5 Why analysis – shall be written down in section D4 of the 8D report and all discovered root causes.

## 7.7 Discipline 5: Define and verify corrective actions

At a first glance, actions like training of people, to sensitize employees, etc. will never solve a root cause. Therefore, those actions are no suitable corrective actions and won ´t be accepted from customer as a valid counter measure. A corrective action needs to solve the identified root cause(s) and prevent the re-occurrence of the described issue in the future. In this step the corrective actions are defined and verified by using e.g. a FMEA to spot additional problems by implementing the defined corrective actions, performing an impact analysis to ensure not causing additional problems with the permanent solution. Within the 8D report objective evidence shall be given that the permanent corrective action will solve the problem sustainably and no side effects will cause new issues.

## 7.8 Discipline 6: Implement and validate corrective actions

Once the corrective action is defined and verified, implement the corrective action in daily business. Monitor the new solution / change for an appropriate period of time to make sure that the solution is working correctly and make sure that there are no unexpected side effects coming up (validation).

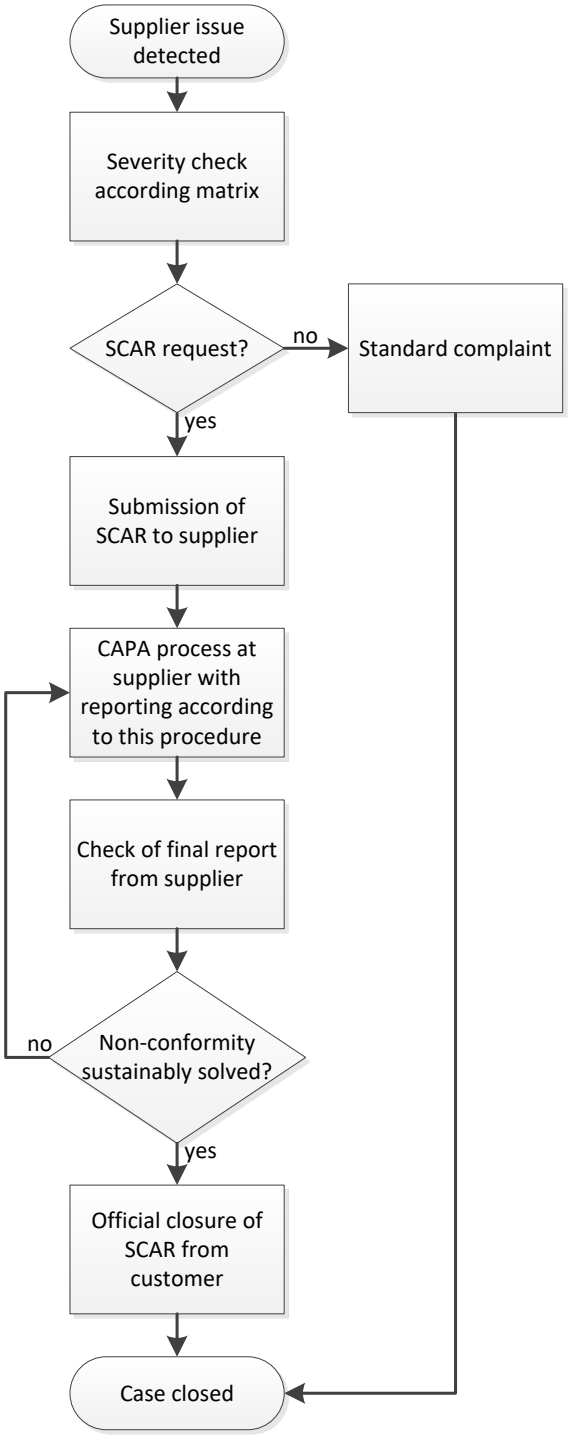
## 7.9 Discipline 7: Identify and implement preventive measures

During this step it shall be checked whether other (similar) products, processes, etc. may have the same weakness or be potentially affected. Check, if the new solution(s) may fit to other products or processes to prevent a similar problem at other points. Once identified transfer the solution to those points, too. Paying respect to risks described in discipline 5 and 6.

## 7.10 Discipline 8: Congratulate the team

Last step in the 8D process is to celebrate and reward the team ´s success and closing the 8D. Thank everyone involved, and be specific about how each person ´s hard work made a difference. Before the team disbands, conduct a post-implementation review to analyze whether the found solution is working as expected, and to improve the way that problems in the future will be solved as well as conduct a Lessons Learned. The lessons learned shall be written in the 8D report within D8.

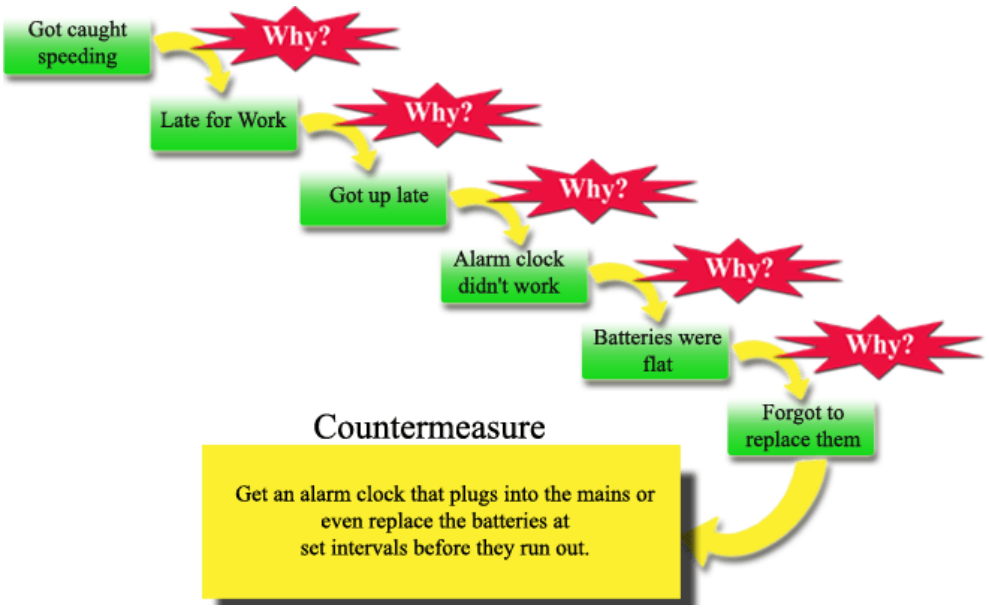
# 8 Flow Chart SCAR



# 9 Method descriptions

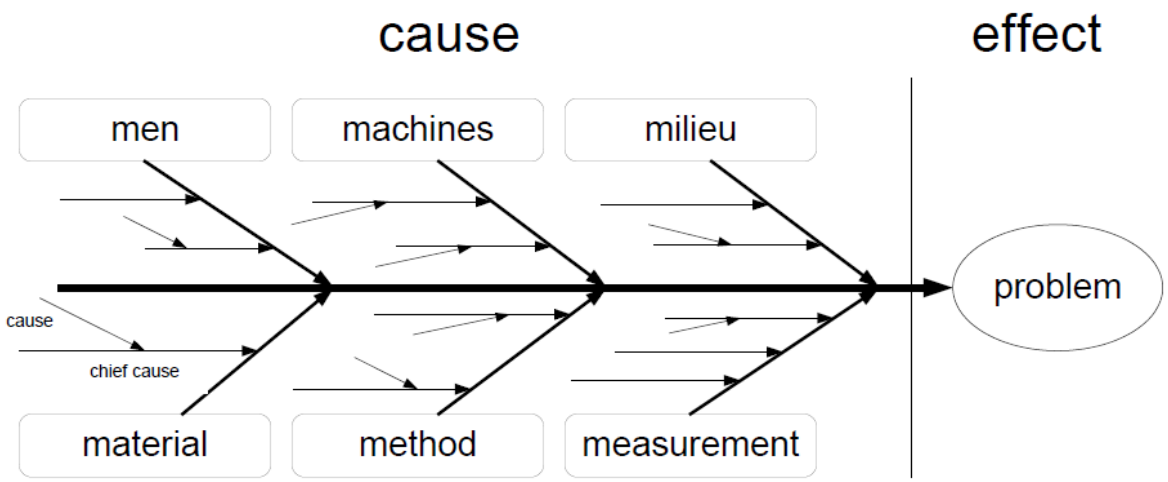
## 9.1 5 Why

The 5 Why method is a question technique for cause analysis. It stands for: asking the question “Why?” at least 5 times to find the root cause of the problem. After the first “Why” the following refers to the answer before. You achieve as you get deeper into the problem and the root cause is identified.




## 9.2 Ishikawa / Fishbone / Cause & effect diagram

Starting point is a horizontal arrow. At its end stand the problem / issue to be considered. The main influencing values (6M) material, method, measurement, men, milieu (surroundings, workplace, etc.), machines adjoin to the arrow. The 6M could be extended to 8M with Money and Management. Possible causes are attributed to a main influencing value. An arrow means: contribute to that…. The effect of that causes are attribute to a cause leads a fine ramification of the diagram. Afterwards the possible causes are weighted according their importance and influence to the issue. The cause(s) with the highest probability will be determined.




## 9.3 Brainstorming

Brainstorming is a group process that involves the spontaneous contribution of ideas from all attendees of the group. This is one of the most widely used decision making strategies. This tool is used to by teams to identify results to a given question. Brainstorming has a tendency to produce old and familiar ideas so it is important that the moderator of the group encourages creative thinking.

Best approach to brainstorming combines individual and group brainstorming. Group brainstorming needs formal rules for it to work smoothly. Where possible, participants in the brainstorming process should come from as a wide range of disciplines as possible. This brings a broad range of experience to the session and helps to make it more creative. Don ´t make the group too big – as with other types of teamwork, groups of between 5 to 7 people are most effective.