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Supplier Change Management Guidebook

This guidebook is a document about “Change management" for suppliers who have business with (Astemo).
Please refrain from disclosing this information to Tier-N suppliers who do not do business with us.

Supplier Quality Management Department

Quality Management Functional Division

Astemo, Ltd. (AM Region)

Rev 4.0 December/2025

CONFIDENTIAL

Background

Astemo issued a "Supplier Quality Manual," according to which we asked our suppliers to implement change management; however, incidents of serious quality defects have continued to occur due to inadequacies in its implementation.

In order to maintain continuous quality stability, production-related changes and 4M change points must be identified and recorded in 4M. Also, all information must be shared among the production-related divisions, and with this information, necessary actions must be mutually prompted.

This guidebook is to explain change management methods (Change points/4M change points) and includes explanations of example cases. We ask you to disseminate and notify the contents of this book to be utilized at the manufacturing sites and Tier-N sub-suppliers.

In doing so, we hope that suppliers improve their level of change management to prevent future quality defects as well as establish high-quality manufacturing sites.

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1. Importance of change management

1. Importance of change management

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1) Purpose

To prevent the occurrence and outflow of quality defects

For this,

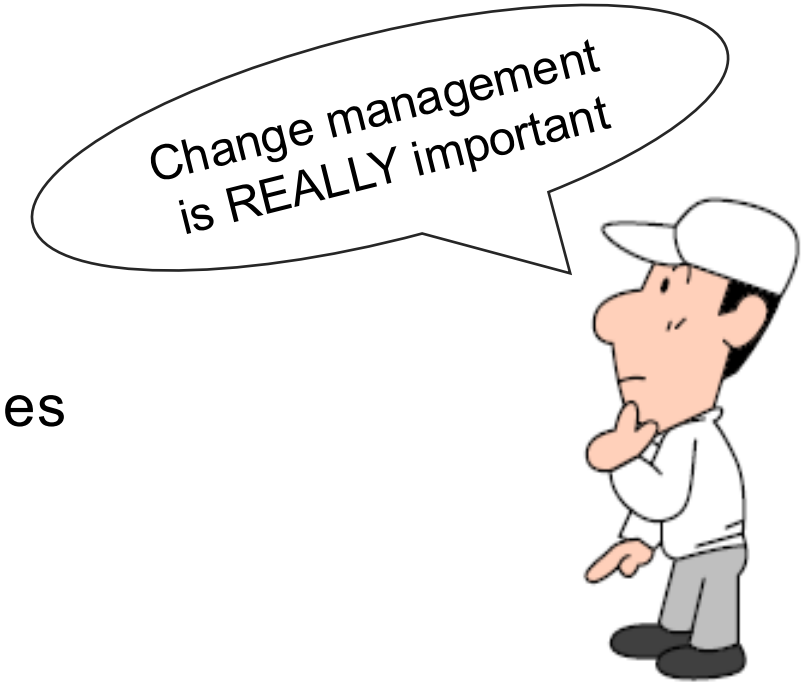
① Record details of the 4M change, actions that were taken in response, and checked items, etc.

↓

② Share the recorded information with relevant parties

↓

③ Mutually prompt necessary actions based on the recorded information



1. Importance of change management

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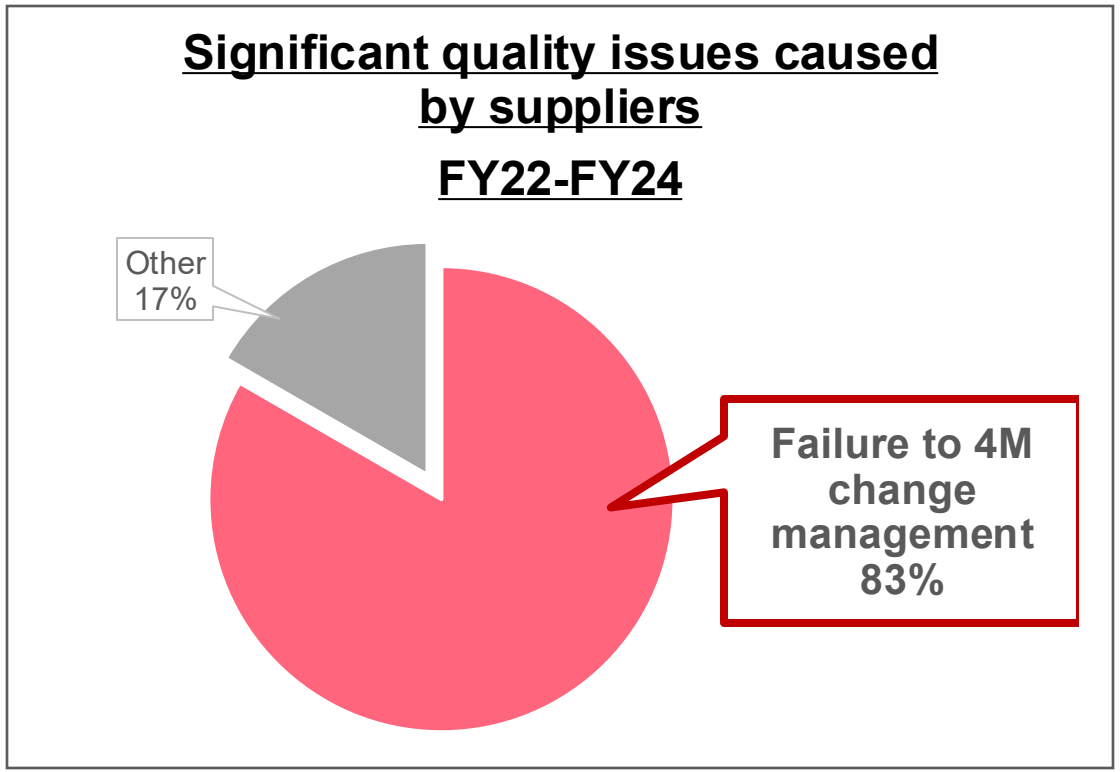
1) Purpose and current situation

83% of significant quality issue are caused by the “Failure to 4M change management”



Major issues on supplier’s 4M change management process:

- ✓ Silent change
  (material / process change without notification to Astemo)
- ✓ Poor standardization for non-routine jobs
  (Maintenance / Process setting change)
- ✓ Insufficient risk assessment prior to change and poor verification after change
- ✓ 4M change points were not recorded
  (Failure to identify the scope of the defects caused increased damage)

1. Importance of change management

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2) Definition of change management

Change point : Planned changes

Design changes, changes in manufacturing/work methods, change of suppliers' contractors, etc.
Application and approval must be made to Astemo.

4M change point : 4M (Man, Machine, Material, Method) alterations and changes that may occur in daily production of products

① Urgent changes due to unexpected reasons
② Unexpected changes that occur as time proceeds
③ Secondary effects due to indirect alterations/changes, etc.

1. Importance of change management

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3) Definition of 4M

What is 4M? ・・・ The four factors that influence manufacturing quality, essential for on-site product quality management.

- Man
  Elements related to people (workers) involved in manufacturing on site.
- Machine
  Elements related to machine tools and equipment used in the manufacture of products.
- Material
  Elements related to the materials used in the manufacture of products.
- Method
  Elements related to the method and conditions under which the product is manufactured.

1. Importance of change management

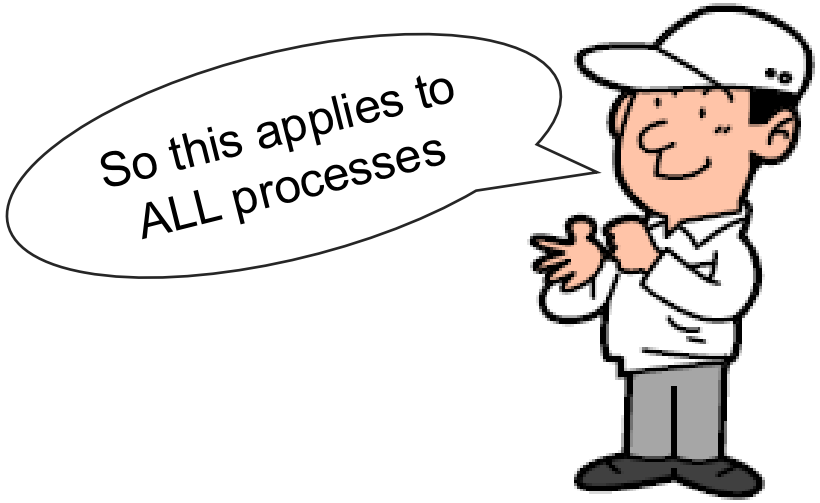
4) Scope and target

＜Scope＞

All processes necessary to manufacture products. This includes manufacturing processes for finished products, and parts/materials produced and managed by suppliers, secondary and subsequent suppliers, etc.

Key points!

- Changes of transportation, packing, and storage, etc., are included
- Changes of secondary materials are included such as the processing oil, or rustproof oil
- Changes within specifications/standard values are included
- Rework and repair are included

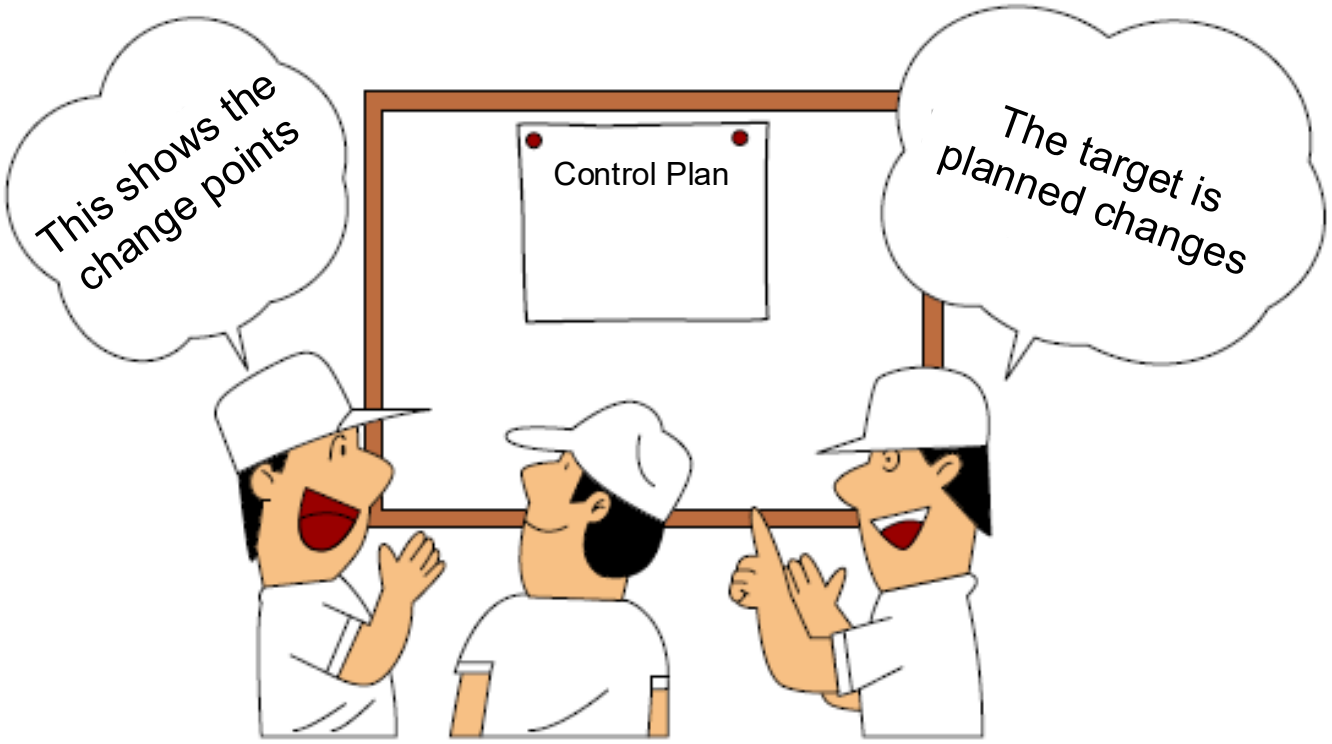


2. Change point management

2. Change point management

1) Summary

The supplier shall control the change of design, the manufacture method, the working method and/or supplier's subcontractors' changes.



2. Change point management

2) Target

The target shall be the design changes and manufacturing changes below.
For changes in Tier 2, 3 and subsequent suppliers, the supplier shall obtain the change information and submit an application to Astemo.
If there is uncertainty as to whether an application is necessary, the supplier shall contact the responsible quality assurance department of Astemo.

Why ?

➡ To set appropriate quality evaluation items and prevent quality defects caused by changes.

In addition, the non-application may lead to the quality compliance issue.

2. Change point management

2) Target

(1) Design changes

(a) Changes in drawings of ordered parts (parts and embedded software in parts) including trial products and changes in delivery (procurement) specifications, etc.

(b) Changes pertaining to important characteristics (special characteristics, special processes, etc.) specified by Astemo or the supplier.

(2) Manufacturing changes

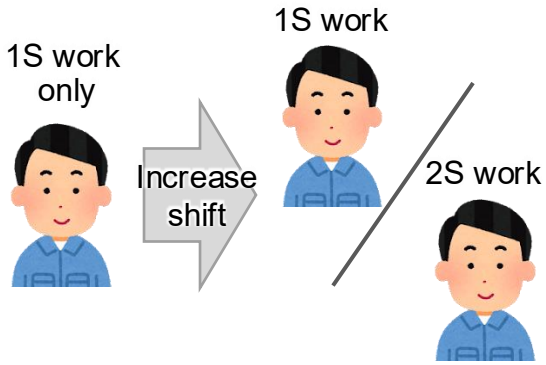
Table 12.1 When specific examples of changes and 4M change points are true.

＊1：Refer to

2. Change point management

2) Target ~ Example and risks of change points ~

Man: Change in worker assignment



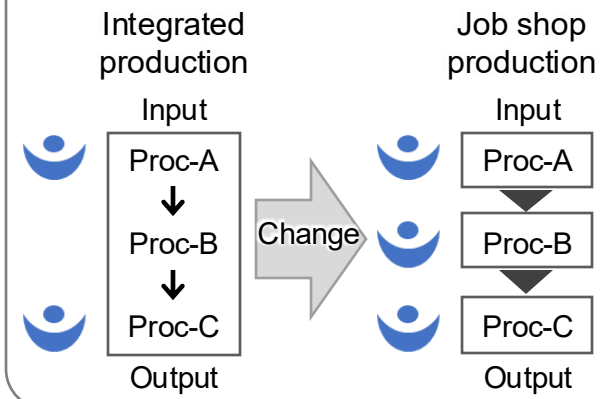
Risk

Defect occurrence and outflow due to unskilled workers

Action

Worker education, production trials, work observation

Machine: Process layout changing



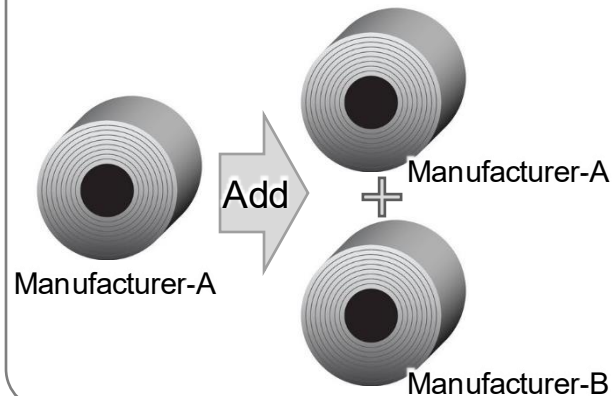
Risk

Process skip or appearance defect due to the product transportation method changing

Action

Revise and update the work instructions, and training
Process audit after layout change

Material: Manufacturer addition (dual sourcing)



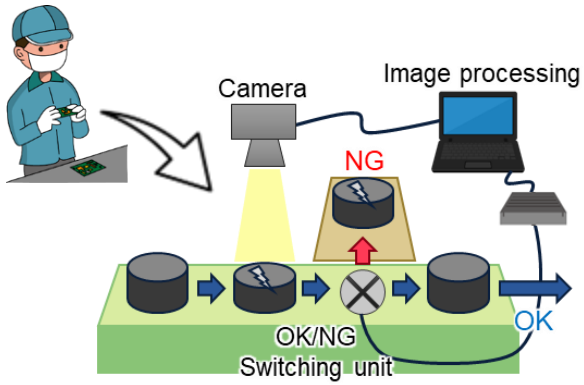
Risk

Impact for product quality and quality variations due to changes in material properties,

Action

Quality validation and comparison of additional materials (materials, products)

Method: Appearance inspection automation



Risk

Outflow of quality characteristics NG product due to changes in inspection accuracy

Action

Measurement System Analysis
Comparison of the inspection accuracy before and after change

2. Change point management

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Table 12.1 Concrete examples of Change Points and 4M Change Points (1/3)

Area	Object of Change	Item	Example (All items listed below are subject to 4M change management)	Application to Astemo ○: Applicable ＊: Applicable if change affects the quality －: Not applicable
Change Point & 4M Change Point	Man	Worker Inspector	Workers/inspectors outside of authorized limit (new worker etc.)	＊○
			Workers/inspectors within the authorized limit	－
			Long absence from workplace, vacation, assistance from other groups, additional personnel, rotation, shifts etc. (Include workers who hadn't worked for a long time)	－
			Worker placement such as change from 1 shift to 2 shifts	＊○
			Operator of a critical process which is designated as a process requiring IPP control whenever operator change is made	－
	Machine	Machine/Equipment (incl. supplied or loaned) Attachment devices: parts feeders, conveyance equipment (conveyors, shooters, etc.)	New, additional, renewal, modified *Subject to design change application if design changes are included.	○
			Layout and location for line and equipment, movement within or out of the plant	○
			Manufacturing / inspection equipment conditions, parameters (excl. daily adjustment)	○
			Unplanned maintenance/repair	－
			Planned maintenance/repair	－
			Suspending and restarting the production line	－
			Process changes such as equipment abnormalities	－
		Molds (Metal processing, casting, resin molds) (incl. supplied or leased)	New, additional, renewal, modified *Subject to design change application if design changes are included.	○
			Unplanned maintenance/repair	－
			Planned maintenance/repair	－
		Jigs and tools (incl. for inspection) (incl. supplied or leased)	New, additional, renewal, modified *Subject to design change application if design changes are included.	○
			Unplanned maintenance/repair	－
			Planned maintenance/repair	－

2. Change point management

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Table 12.1 Concrete examples of Change Points and 4M Change Points (2/3)

Area	Object of Change	Item	Example (All items listed below are subject to 4M change management)	Application to Astemo ○: Applicable ∗: Applicable if change affects the quality –: Not applicable
Change Point & 4M Change Point	Machine	Measurement tools for inspection (incl. supplied or leased)	New, additional, renewal, modified dedicated/general purpose measurement equipment/gage/master (incl. calibration) *Subject to design change application if design changes are included.	○
			Planned maintenance/repair	–
	Material	Material	An occurrence of a difference of some kind (material supplier, structure, composition, ingredients, grade, dimensions) from the original purchase. To change the material, apply according to Design specification change request form	○
		Secondary material Packaging material	Hydraulic oil, processing oil, test liquid, cleaning agent, flux, solder, mold release agent, abrasive, lubricant, compounding agent, additive agent, rustproof oil, paint, adhesives, solvent, atmospheric gas, welding shielding gas/monitor, packing material, etc. includes change of material ingredients change not related to a specification change	∗○
	Method	Production	(1) Processing standards for welding, surface treatment, heat treatment, assembly, conditions for cutting, plating, buffing, coating, casting, forging, brazing etc., and molding conditions for rubber and synthetic resin. (2) Consolidate, abolish or change in process sequence, layout, change from temporary to (incl. trial) to a permanent process or vice versa (3) Transportation between processes	○
		Inspection	Control contents and standards (conditions, standards, programs, analysis machines, measurement position/methods, sampling conditions, limit sample etc.) related to in-process inspection and delivery inspection. Screening conditions, static electricity control, trimming conditions set value	○
		Transportation	Delivery, packaging (packing methods, packing containers, packing materials), delivery, etc. (workplace for packaging, labeling, etc.)	○
		Storage	Storage method, storage environment (Including products, WIP, components, raw materials, indirect materials)	○
		Program	Software input to parts	○
		Other	Electronic component static electricity countermeasures, contamination / foreign matter control	○

2. Change point management

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Table 12.1 Concrete examples of Change Points and 4M Change Points (3/3)

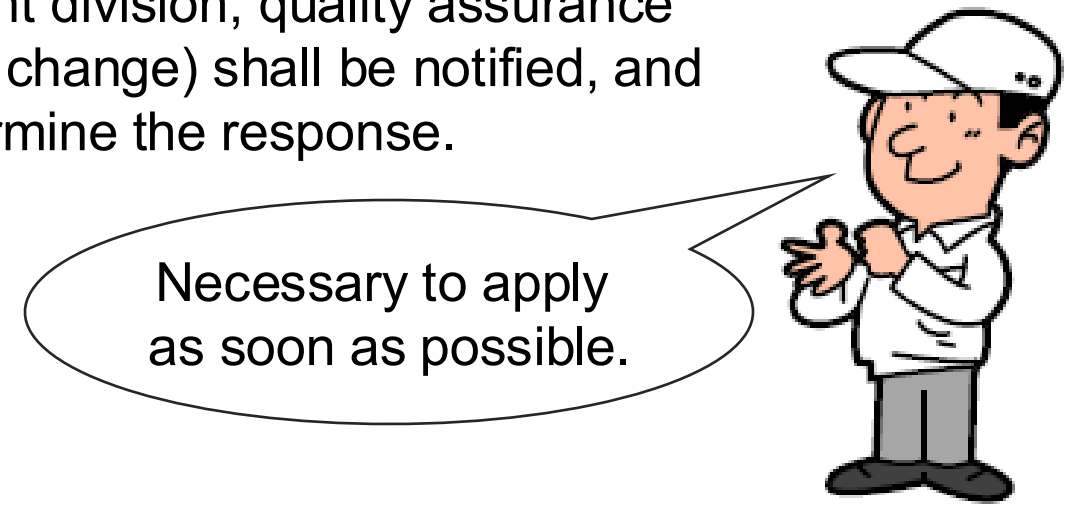
Area	Object of Change	Item	Example (All items listed below are subject to 4M change management)	Application to Astemo ○: Applicable ＊: Applicable if change affects the quality －: Not applicable
Other	Other		(1) When implementing quality improvements based on defect countermeasures and market quality information (2) When manufacturing and delivery are restarted after being stopped for 12 months or more (3) Change from supplied material to self-procured material and vice versa. “Supplied materials (goods)” are materials and parts supplied by Astemo and a part or all of this is used to manufacture products (parts). Material (goods) purchased from customers is "paid supplied materials (goods)”. Materials provided free of charge is "free supplied material (goods)". “Self-procured” material is the parts/materials that the supplier manufactures in-house or procures on their own. (4) Change in in-house/outsourced manufacturing (5) Change of capital structure (joint venture with other companies, spin-offs, change of investing company etc.)	○
			(6) Temporary changes in conditions, setting etc. of equipment for trial tests and evaluation that the Production Engineering Div. conducts (7) Urgent, provisional and permanent manufacturing quality measures due to a sudden increase in production (8) Follow-up on operation delays (9) Findings and changes etc. where whether it affect quality or not cannot be determined	＊○
	Tier 2, 3 and subsequent suppliers		(1) Change from supplied material to self-procured material and vice versa. (incl. suppliers such as trading company, Tier 2, 3 suppliers and thereafter). (2) Change of Tier 2, 3 and subsequent suppliers (including trading companies, suppliers of subsidiary materials) (3) Addition of Tier 2,3 suppliers and thereafter due to dual orders. Note: Change of manufacturing location such as site or factory in the same company shall be treated as a change of supplier. (4) Change in in-house/outsourced manufacturing (5) Change of capital structure (joint venture with other companies, spin-offs, change of investing company etc.)	○

2. Change point management

3) Application Method

(1) When the implementation plan of change is determined, in consideration of the examination period of Astemo, the supplier shall submit an application of change with the forms below to Astemo's Procurement Div **6 months prior to** the start of production of the parts at the very latest.

(2) The supplier shall, at the beginning of the period or any change at any time, apply for changes to us and customers as soon as possible, taking into account the approval period, **as a supplier's responsibility.**
In case of urgent changes, Astemo's procurement division, quality assurance division, and design division (if there is a design change) shall be notified, and discussions on the change shall be held to determine the response.

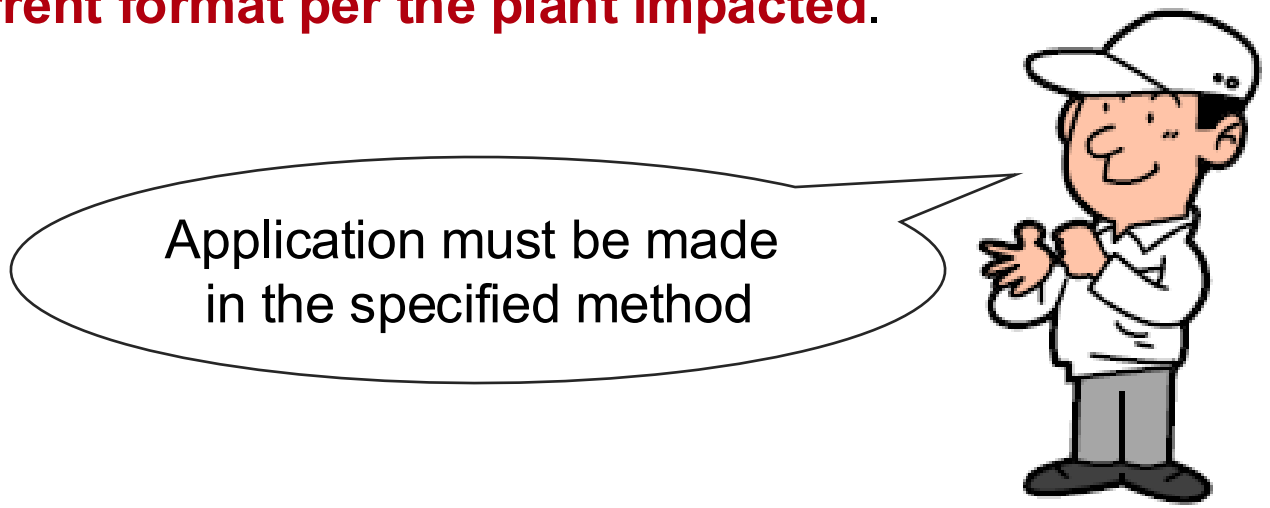


2. Change point management

3) Application Method

(3) The supplier shall submit "Application Plan of Change" to the Astemo's Procurement Div at the beginning of the term, even if the changes are scheduled to be implemented after 6 months or later.
In addition, even if there is no intention to change, the supplier shall submit " Application Plan of Change" with the comment "no plans to change."

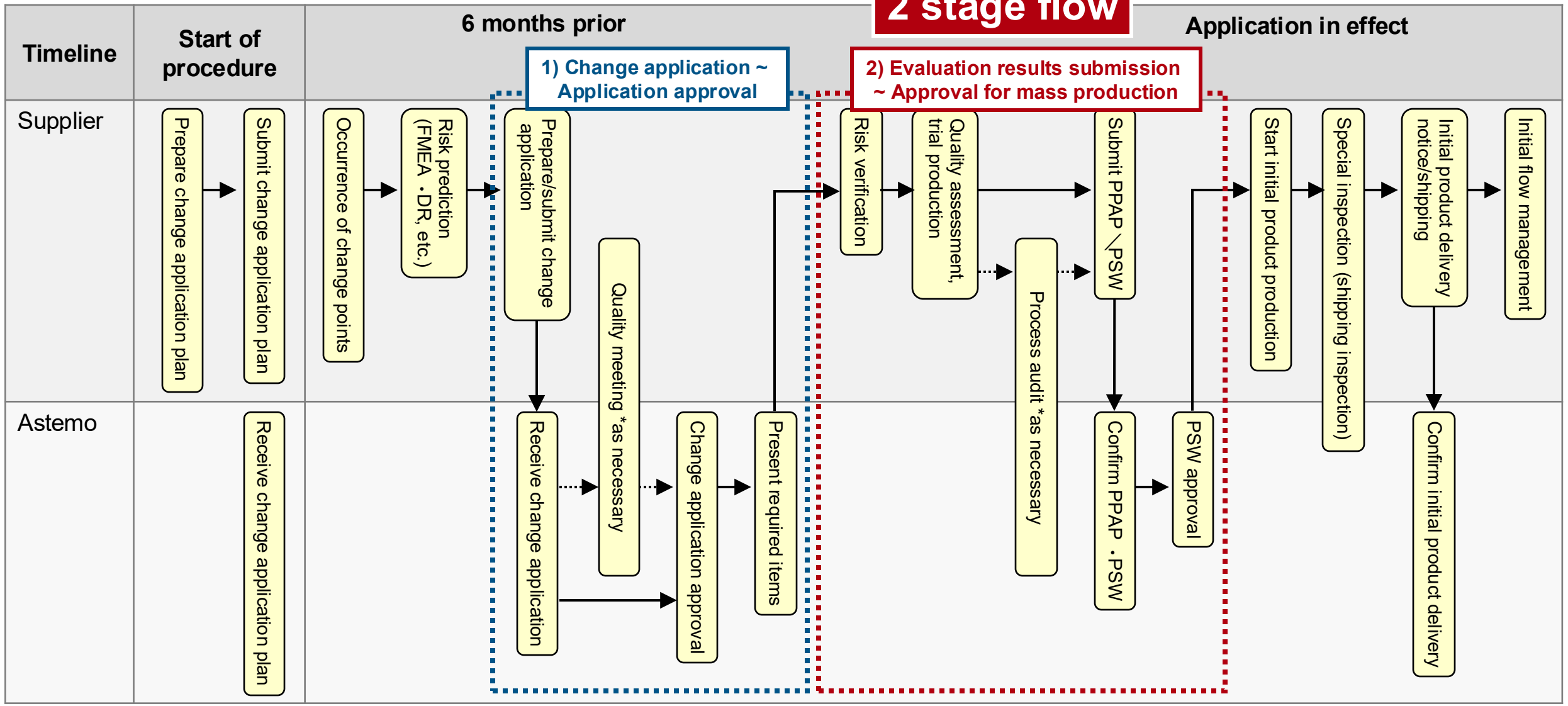
(4) The supplier shall apply for change to Astemo Procurement Div. through **SupplyON** in order to perform a quick and proper change notice. If the supplier is unable to use SupplyON, they shall apply with **the current format per the plant impacted**.



＊1：Refer to Astemo's Global Supplier Quality Manual

2. Change point management

3) Application Method ~ Processing procedure~



2. Change point management

3) Application Method ~ Submit detailed information about change point ~

When supplier submits the change application to Astemo, please include detailed information about the change point.

<Detailed information to be submitted (example)>

- Reasons and details of the changes (before and after comparisons, etc.)
- Risk verification results in supplier
- Quality evaluation items and plans at supplier etc.

Why ?

➡ To carry out change point management more smoothly.

(Reduction of man-hours for information check)

To ensure quality evaluation of change point and to prevent quality defects.

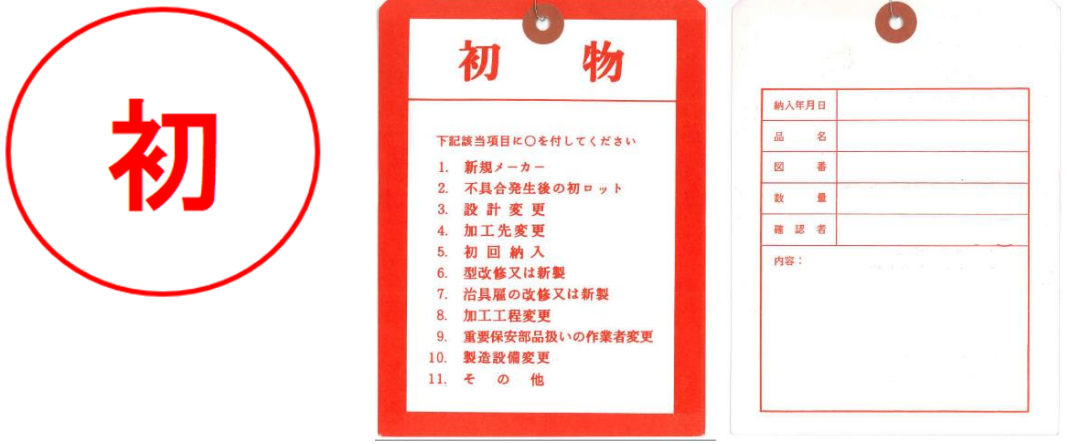
2. Change point management

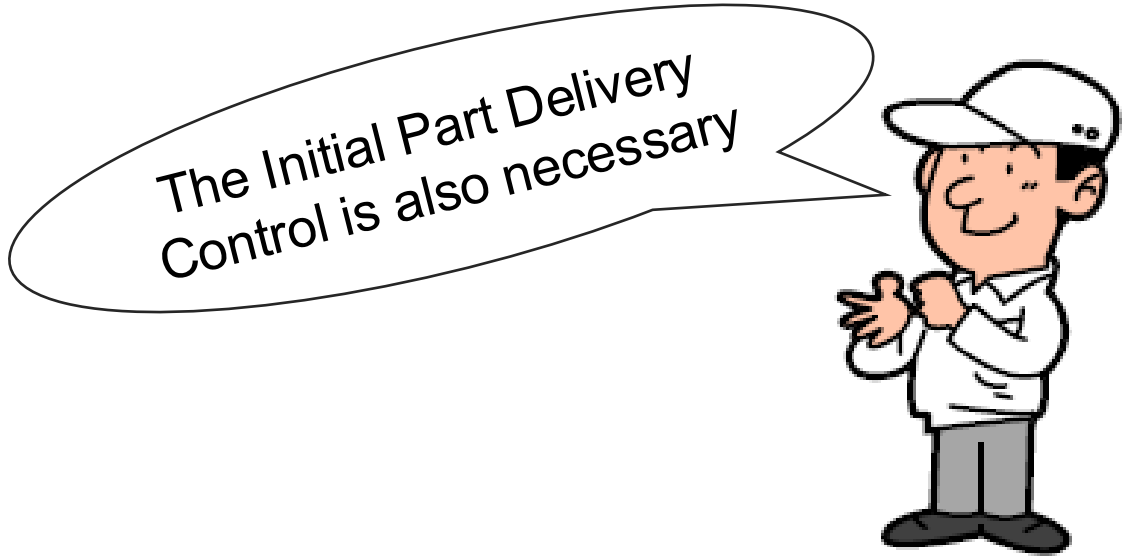
Blue characters：Revised points at SQM Revision 6.2

4) Implementation of Change

After confirming our decision on whether or not to start the change, the supplier will start the change work based on the schedule submitted at the time of the change application and perform the necessary procedures indicated in Section “**9. Production Part Approval Process**" and Section “**10 Initial Part Delivery Control**”.

<Example of Identification Display of Initial Parts –
Contact the plant(s) affected for proper ID>





＊1：Refer to Astemo’s Global Supplier Quality Manual

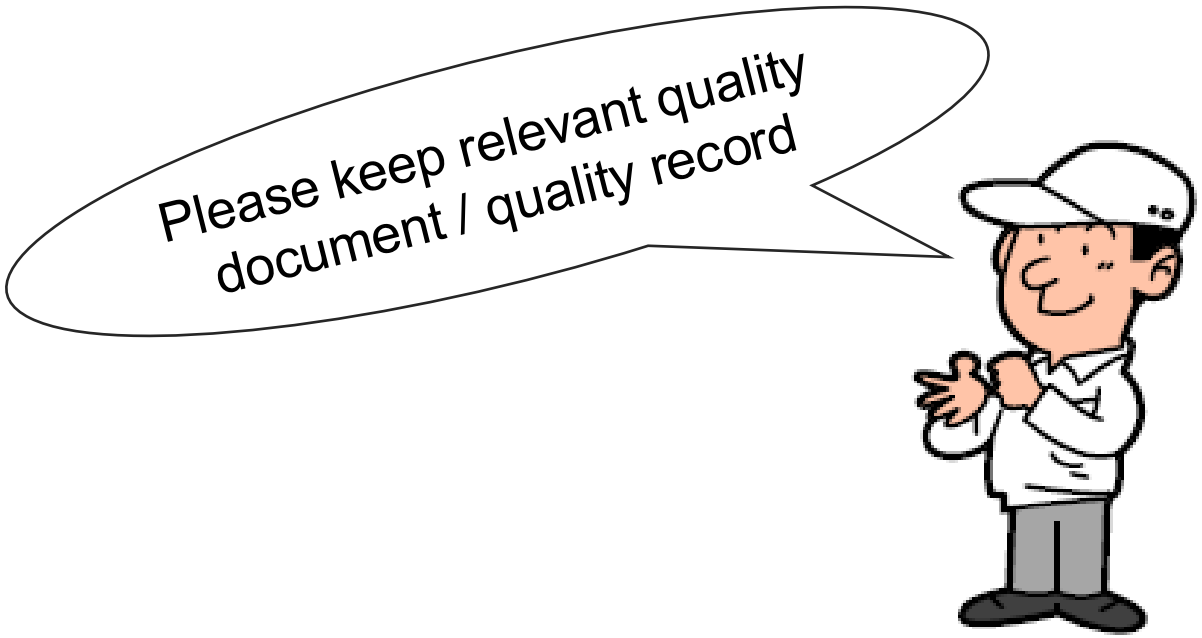
2. Change point management

5) Record Control

Refer to " Table 4.1 Quality Record Preservation Period [*1] " in "4. Quality Document / Quality Record Control [*1] ".
The supplier shall retain and manage records of all changes regardless of whether they are reported to Astemo.

<Covered Quality Document / Quality Record>

- Process change etc. application
- PPAP documents
- Parts validation test results
- Manufacturing condition validation results
- Operator training records　　etc.



＊1：Refer to Astemo's Global Supplier Quality Manual

2. Change point management

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6) Key management point -1

Roles and check items of the divisions relevant to the change points, e.g., the manufacturing and quality divisions, should be clarified in advance, and **conduct the risk assessment for changes**.
Also, the confirmed results of the required check items must be given **the final evaluation and judgement** by the quality manager.

Why ?

➡ There is a risk of the quality check being insufficient as the staff in charge will be conducting the check based on individual experience and intuition,

resulting in a quality defect due to the change point!

2. Change point management

6) Key management point -2

Progress management (plan/actual) should be conducted so that the progress status of the change point management can be confirmed.
(From customer application to approval and initial product delivery results, etc.)

Why ?

➡ There is a risk of inadequate schedule management before the change application, leading to application with insufficient quality confirmation and production stoppage.

Example) Change point progress management ledger

yyyy/mm ****年 **月度	Dept. name：Q.A. Sec. 部門名： 品質保証課

Circle one that applies Enter Submission date.
どちらかを○で囲む（ ／ ）は提出日程記.

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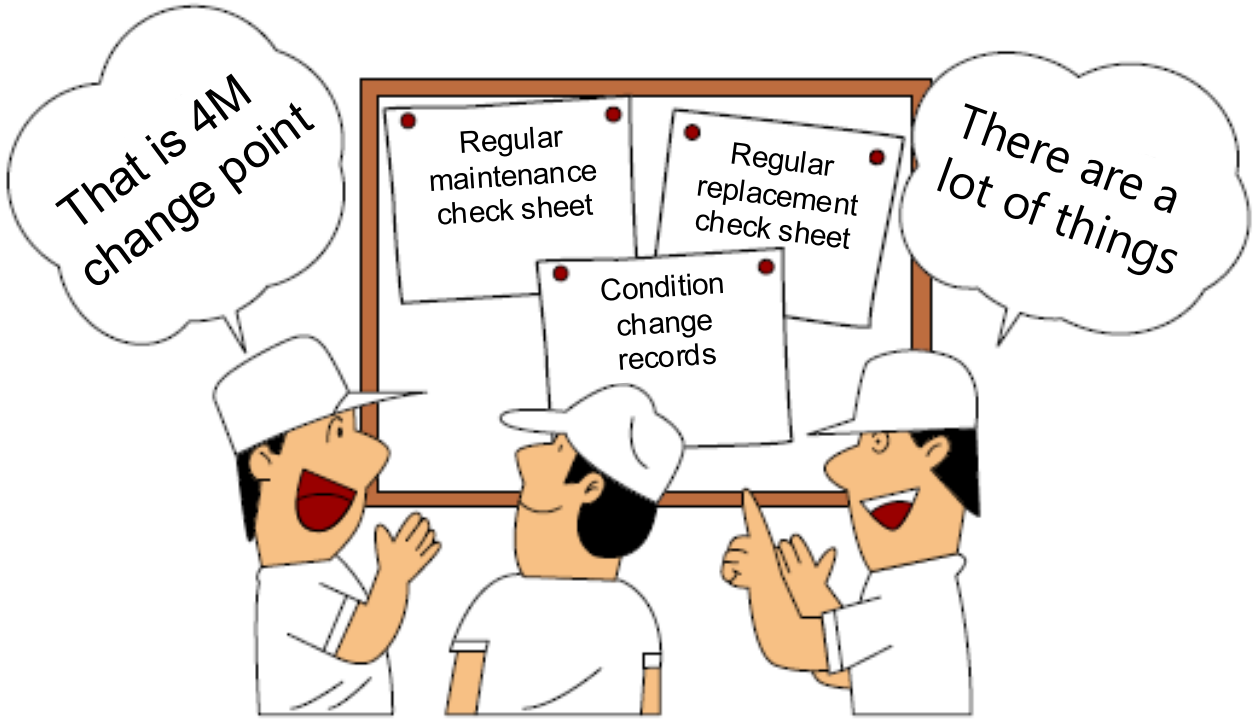
Initial planning meeting date of implementation 初物計画打合せ実施日 / Quality Meeting Date Implemented 品質打合せ実施日	Control № 管理No. / Acceptance date 受付日	Issuing department 発生部門 (Line name ﾗｲﾝ名 / Process name 工程名 / Supplier name サプライヤー名)	Model 機種	Part No. 品番 / Part name 品名	IPP classification № 初物区分No.	IPP description 初物内容 (Change point 変更点 / Design change № 設変No. / Countermeasure description 対策内容)	Advance report 事前報告 Need/No Need 要否	Yes/No Judgment 要否判断 Need/No Need 要否	Advance submission to customer 顧客への事前提出 Need/No Need 要否	Approval to start of production (SOP) 量産移行可否 / A rank Quality responsible Dept. Judgment result Aランク 品質担当 判定結果	Application timing 適用時期 Manufacturing date(Lot №) 加工日(ロットNo.)	Application timing Ship date 払出し日	Control PIC 管理担当
2018/10/2 2019/1/16	G109-Q.A.-011 G109-品証-011 1/15	Assembly line A Caulking process 組立Aライン 加締め工程	***	*****-***-** ○○○ASSY	6	Caulking machine renewal (caulking proposal is the same as the existing machine) 加締め機更新（加締め方案は既存と同様）	Need/要 (1/15) No Need 不要	Need/要 (1/24) No Need 不要	submission to customer 顧客提出 (1/24)	Pass / Fail 合格 ・ 不合格 Approval day 承認日 (2/16)	2/17 (B-17)	2/17	○○

3. 4M change point management

3. 4M change point management

1) Summary

The supplier shall record 4M change points that could happen in daily operations for product manufacturing and utilize the record for preventive activities of quality issues. When there are quality defects, the supplier shall control risks including narrowing down the scope of target and 4M change point control shall be implemented.



3. 4M change point management

2) Definition of 4M Change Points

4M change points refer to all changes including intentional changes in specification of parts, changes in proposed manufacturing methods that are planned, unintentional or intentional, and other unintentional changes such as power outages.
All items of “Table 12.1 Concrete examples of change points and 4M change points*1” are subject to 4M change point management.

Why ?

➡ Quality defects are most often caused by some sort of change point.

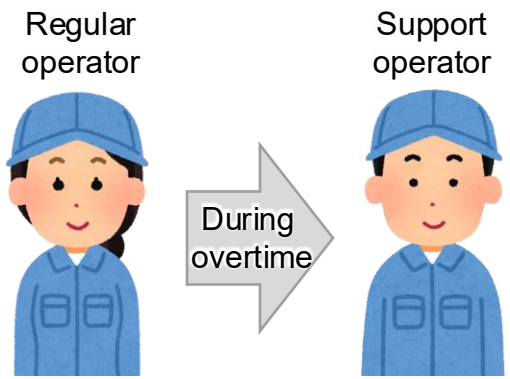
If 4M change point management is not implemented, identification of the cause and scope of quality defects will become difficult upon occurrence.

＊1：Refer to Astemo’s Global Supplier Quality Manual

3. 4M change point management

2) Definition of 4M change points ~ Example and risks of 4M change points ~

Man: Support operator



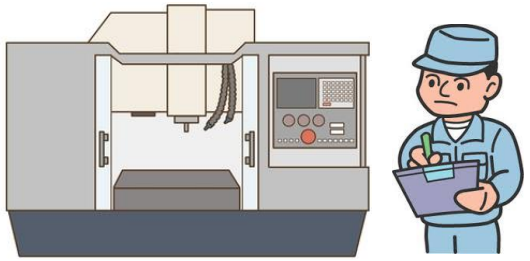
Risk

Occurrence and outflow of defects due to inexperience or lack of understanding of rules

Action

Operator training, skill management, work observation

Machine: Regular maintenance of equipment



Risk

Changes in equipment accuracy due to maintenance errors during regular maintenance

Action

Quality checks and comparisons before and after the regular maintenance

Material: Manufacturing lot # changing

Change manufacturing lot # of component parts

Risk

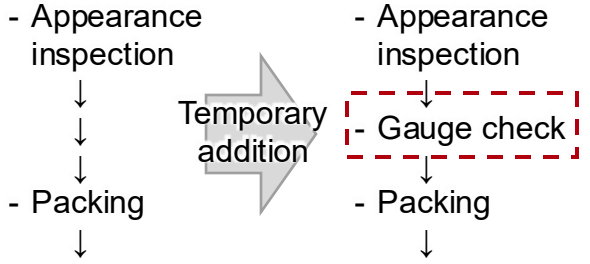
Impact on product quality by quality variations between manufacturing lots

Action

Implementation of lot traceability management
Quality check after lot change

Method: Temporary inspection process addition

Add temporary inspection process due to quality defect



Risk

Inspection errors or secondary defects due to lack of proficiency

Action

Standardizing temporary inspection methods and training inspector, work observation

3. 4M change point management

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3) 4M Change Point Control

For products and parts that have undergone 4M change, make the following confirmation:

(1) The Manufacturing Div. should keep **records** of all change points and quality confirmation results.
(2) The Quality Assurance Div. (third party) should carry out quality confirmation 100% and **record** it.

(3) The records of 4M change point control shall be made based on “Table 13.1[*1]“ with the recommended report form. In cases where the supplier has their own operational rules, the rules may be permitted upon consultation with Astemo’ Quality Assurance Div. (or Production Technology Div.).

Why ?

➡ When a quality problem occurs, to identify the scope (manufacturing lot, etc.) and cause of the product based on records.

＊1：Refer to Astemo’s Global Supplier Quality Manual

3. 4M change point management

Table 13.1 Record of 4M Change Points

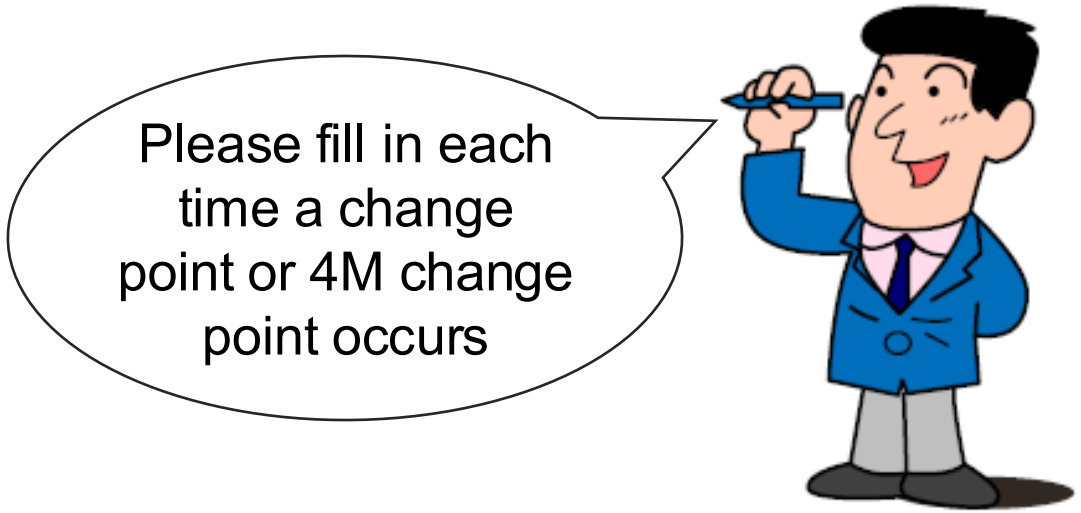
No	Item	Content	
1	Production line name, production line number, division name, group name, date of creation, and shift category	Enter the relevant production line name, line number, division name, group name, date of creation, and shift category. The shift category shall be indicated by circling the applicable option. Form A can be altered according to shift style (ex. day/night, early/late/night, etc.)	Enter the name of the team leader or someone designated by the team leader.
2	4M category	Enter the applicable 4M category.	
3	Contents of 4M change point	Enter the process name and details of the change.	
4	Contents of actions and countermeasures	Enter the actions implemented for the change and the countermeasures implemented as necessary.	
5	Verification items and methods after the implementation of actions and countermeasures and the results	Enter the quality verification items and methods that were implemented after the actions and countermeasures with the results. Put a signature or stamp for approval if any comments are made.	
6	The person in charge of verification	The Quality Assurance Div. (the person in charge of quality assurance of the production line concerned) shall verify No. 2, 3, 4, and 5 and put a signature or stamp for approval.	
7	Comments	The manager or assistant manager of the related division and the Manufacturing Div. shall verify and put a signature or stamp for approval. Comments shall be entered if necessary.	

＜Example of how to fill in＞

① Written by
The team leader or the person assigned by the team leader

② Filling frequency
Each time a change point or 4M change point occurs

③ Posting Location
Near the manufacturing process (in place)



3. 4M change point management

3) 4M Change Point Control ~ Control example ~

Item No.	5.12	Rev.	5.1
		Form No.	5.12-1

Form A

4M Change Point Control Sheet

Production line name : Machining　Production line No. : #○　Group name : M/C ○ Dept.

Date entered : yyyy/mm/dd　(Shift category : Day, Night)　Team name : Team-A

Manager	Assistant Manager	Team leader	Entered by
○○	△△	◇◇	□□

(Note).4M change point shall be described clearly with 5W1H (when, at where, by who, for what and how)

4M classification					Contents of 4M change point		Contents of actions/countermeasures	Verification items and methods and results after the actions and countermeasures	Person made verification	Comments	(Sign)
Man	Equipment Jig/tool	Method	Material	Prod.eng. Test,etc	Process name	Contents					
	E				Welding	Power outage due to lightning	Discard work-in-process products. Check the appearance of the welded product and the tensile strength after restoration.	Discarded work-in-process products. (** pcs) Results of appearance confirmation and tensile strength check were okay	▽▽	Be sure to discard work-in-process products.	○○
B					Inspection	Qualified inspector B worked because inspector A had a sudden paid leave.	Conduct work observations 200% inspection	Work observation results, no problems No NG occurs even if the inspection is 200% inspection.	▽▽	check carefully when supporters are worked.	○○

4M Classification Table

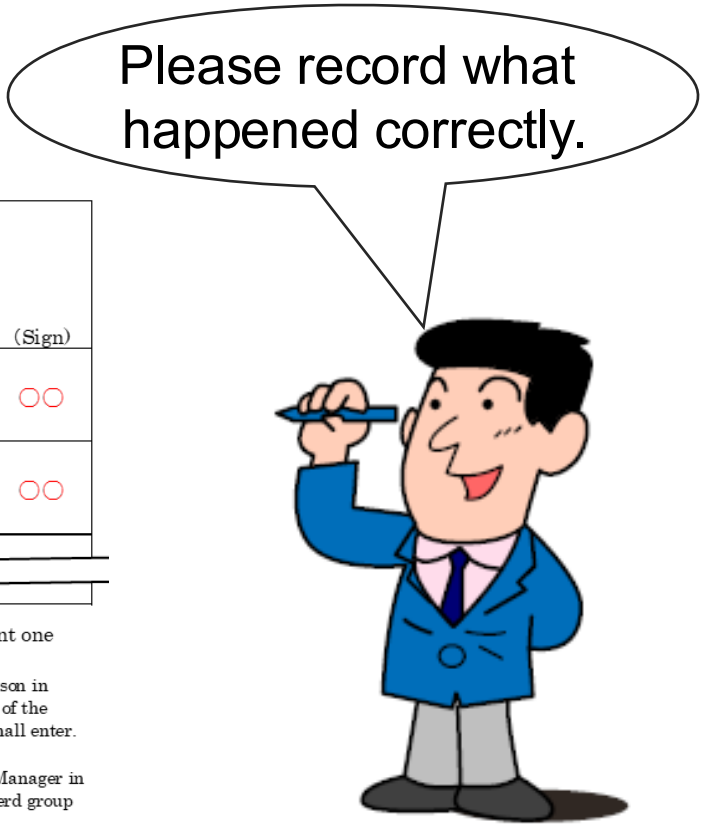
Select the symbol character from the light table and enter it above.

Man	A: New comer　B: Supporter　C: Other
Machine	D: Equipment remodeling/move　E: Repair/adjustment/change of frequent stop of equipment　F: Conditioning/renewal of jig & tool/mold　G: Other
Method	H: Working procedure/process sequence process conditions/equipment conditions　I: Packaging/display　J: Design change/new product　K: Other
Material	L: Quality variation of part/product　M: Maker change, the first lot product after manufacturing change　N: Design change/new setting up　P: Other
Prod.eng. Test,etc	Q: Equipment　R: Cutting tool/jig　S: Working method　T: Material

Shift category: Encircle the relevant one

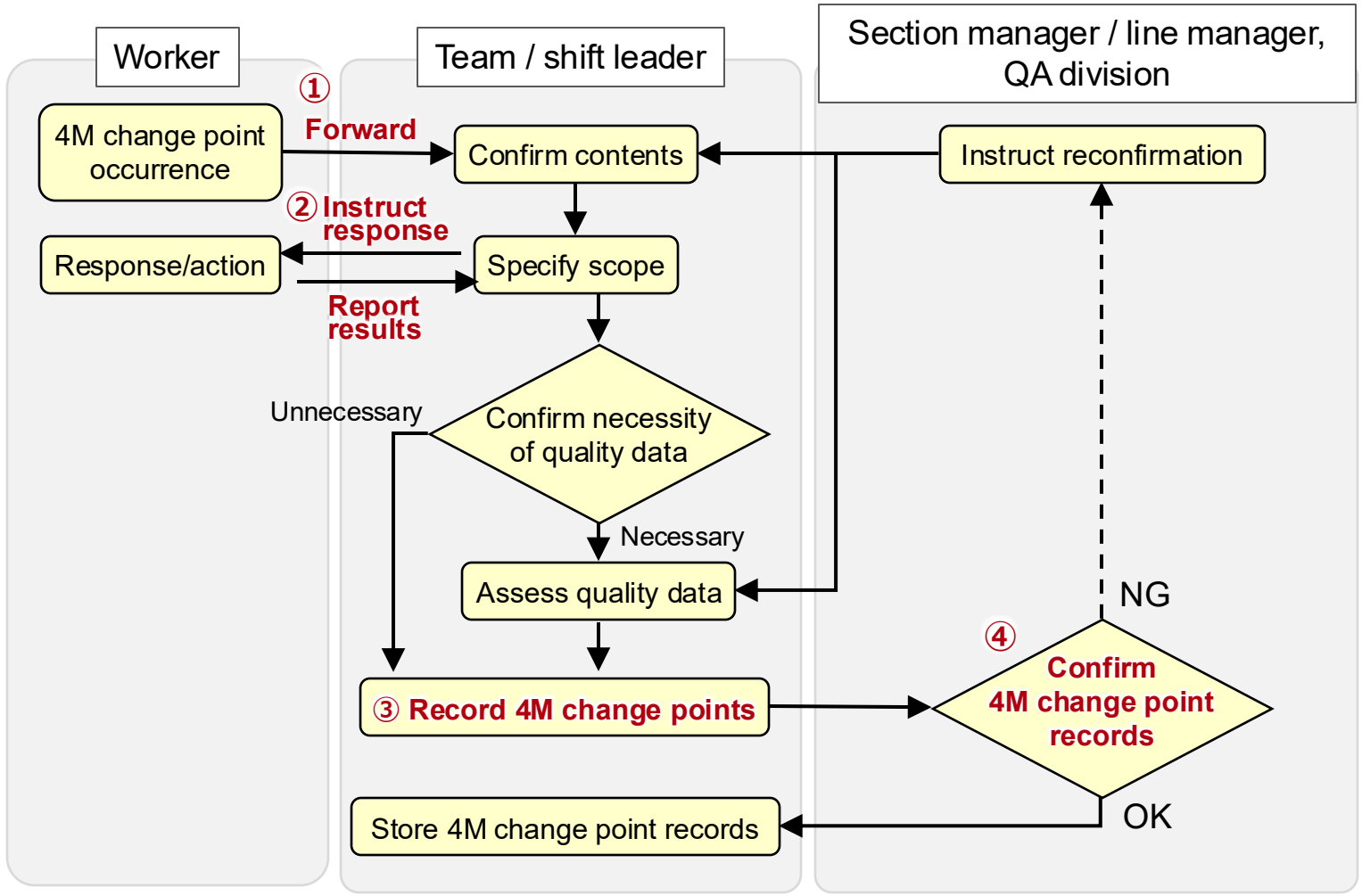
Verifying person: Quality Assurance Gr. (person in charge of quality assurance of the production line concerned)shall enter.

Comments: The Manager or Assistant Manager in Manufacturing Group/relaterd group shall enter.



3. 4M change point management

3) Management of 4M change points ~ Operation flow ~



Key points!

① Workers should not make decisions on their own but forward the contents to team / shift leader.

② Team/shift leaders check the contents and instruct how to respond to the situation.

③ Team/shift leaders record the 4M change points that occurred.

④ The section manager/line manager of the manufacturing division and the quality assurance division checks the 4M change point records.

3. 4M change point management

Astemo
Mobility Beyond

4) Application to Astemo

(1) Issues that may affect quality shall be reported to Astemo' Procurement Div. and Quality Assurance Div., and applications shall be made according to Astemo' instructions

<Examples : 4M change points that need to be applied for>

- When using alternative equipment that produces similar products due to equipment trouble.
- When changing the process sequence or work order due to the increase in the number of production,

etc.

Key points!

- Before shipping the target products, the application and approval are necessary in the same way as the change point management.

3. 4M change point management

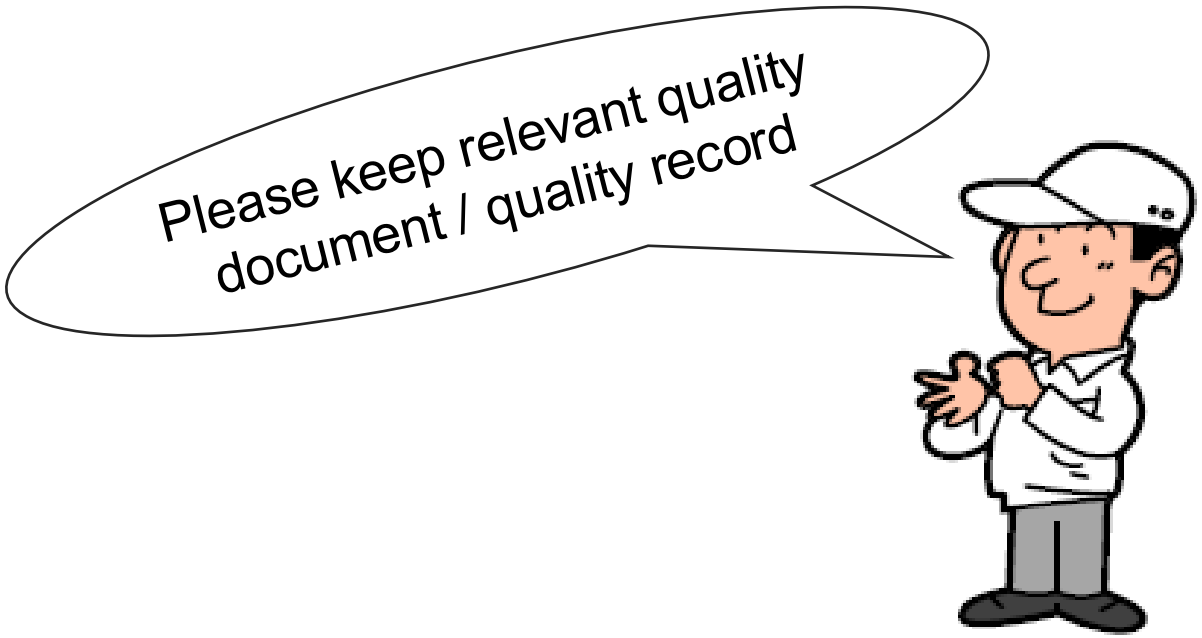
5) Record Control

(1) Refer to "Table 4.1 Quality Record Preservation Period [*1] " in "4. Quality Document / Quality Record Control [*1] ".

(2) The supplier shall retain and manage records of all changes regardless of whether they are reported to Astemo.

<Covered Quality Document / Quality Record>

- 4M change points records
- Daily work reports
- Quality check data
- Equipment maintenance records
- Tool / Jig replacement records　　etc.



＊1：Refer to Astemo's Global Supplier Quality Manual

4. Change management at the manufacturing site

4. Change management at the manufacturing site

1) Purpose

Many changes / 4M changes occur at the manufacturing site. Change management at the manufacturing site is an essential requirement and must be properly understood and performed.

In order to implement
robust change management
at the manufacturing site・・・

Key point ①

Recording and visualization

Key point ②

Sharing and disseminating information to workers

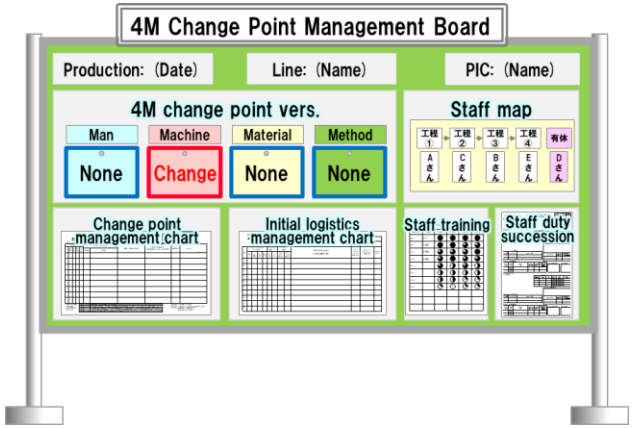
4. Change management at the manufacturing site

Astemo
Mobility Beyond

2) Recording and visualization

Please be sure to record the change points / 4M change points **“every day”**.
(If there are no change points/4M change points, please record as "None")
In addition, it should be **“visualized”** according to each processes, so that all personnel at the plant can easily see the occurrence status.

Reference:
- Using “4M change point management sheet”
- Utilizing “4M change point management board”
- Centralized management of the 4M change point in IT utilization etc.



Why?

➡ Because memory alone will be ambiguous, and retroactive confirmation will not be possible correctly.

And, to share information with all relevant personnel within the plant to prevent oversights in responding to change points and 4M change points.

4. Change management at the manufacturing site

Astemo
Mobility Beyond

3) Sharing and disseminating information to workers

Information concerning 4M changes of the previous day and the change point plan for the day should be shared and disseminated among workers at morning meetings, etc. Also, establish responsive actions and follow up on progress.

・4M change point contents/response results of the previous day (or previous shift)
・Contents of duties to be taken over from the previous day (or previous shift)
・Change point plan for the day (trial product production plan)　etc.

Why?

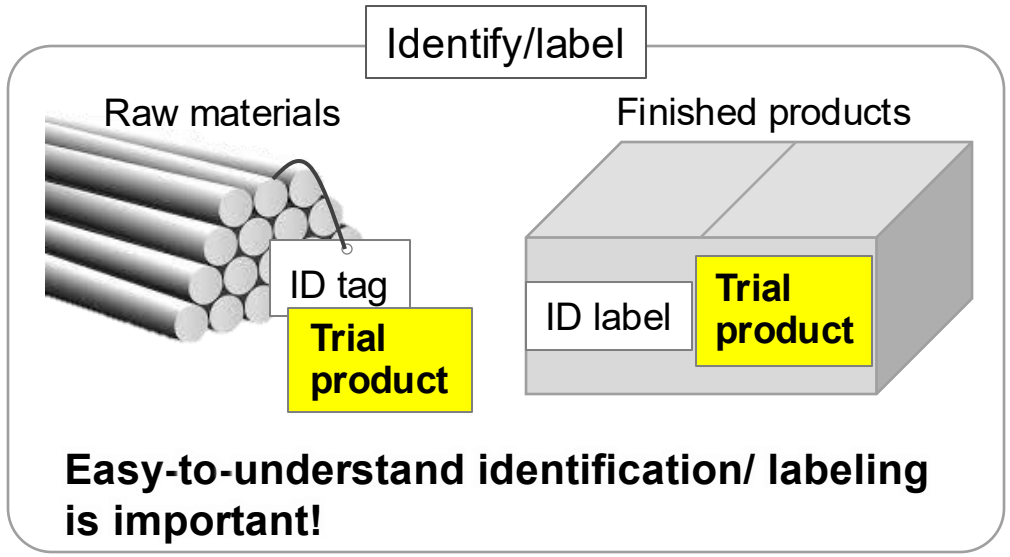
➡ Sharing with workers will enable preparation for changes and appropriate response to 4M change points, which will in effect lead to prevention of quality defects due to insufficient management/response.

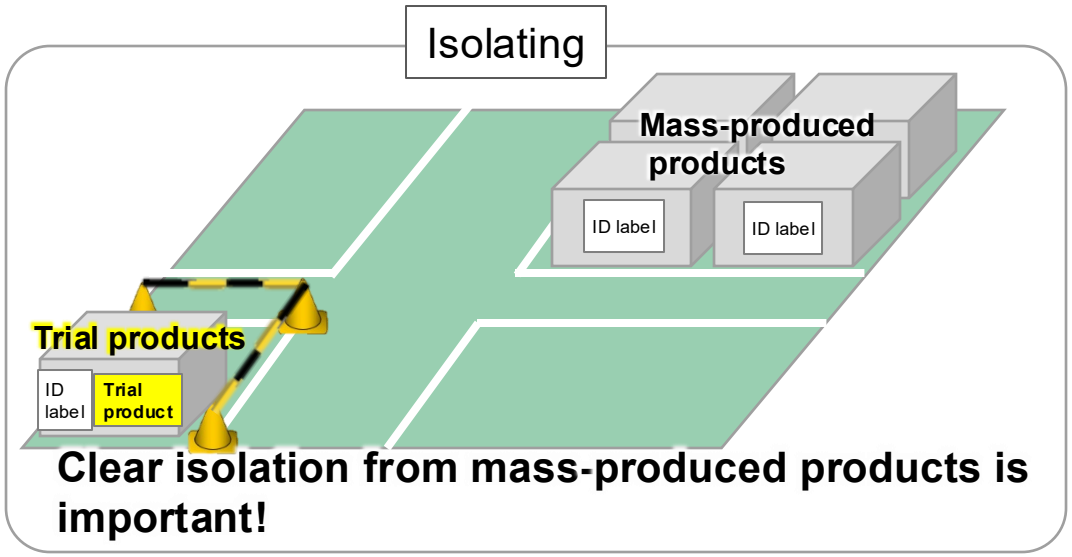
4. Change management at the manufacturing site

Astemo
Mobility Beyond

4) Management of trial products①　～Management of trial materials～

Trial products (raw materials/work-in-progress/finished products), not to be used as mass-produced products, **must be identified/labeled and isolated** so as not to be mixed with mass-produced products.





Why?

➡ In the event trial products are mixed with mass-produced products, all parts/products of the target scope must be subject to countermeasures (retrieval), which will have significant impact on production and quality.

4. Change management at the manufacturing site

Astemo
Mobility Beyond

4) Management of trial products② ～Product management during trial production～

Please clearly set and operate decisions and rules for production/flow of trial products and their return after trial production.

①Mass-production products must isolate when trial products are in production

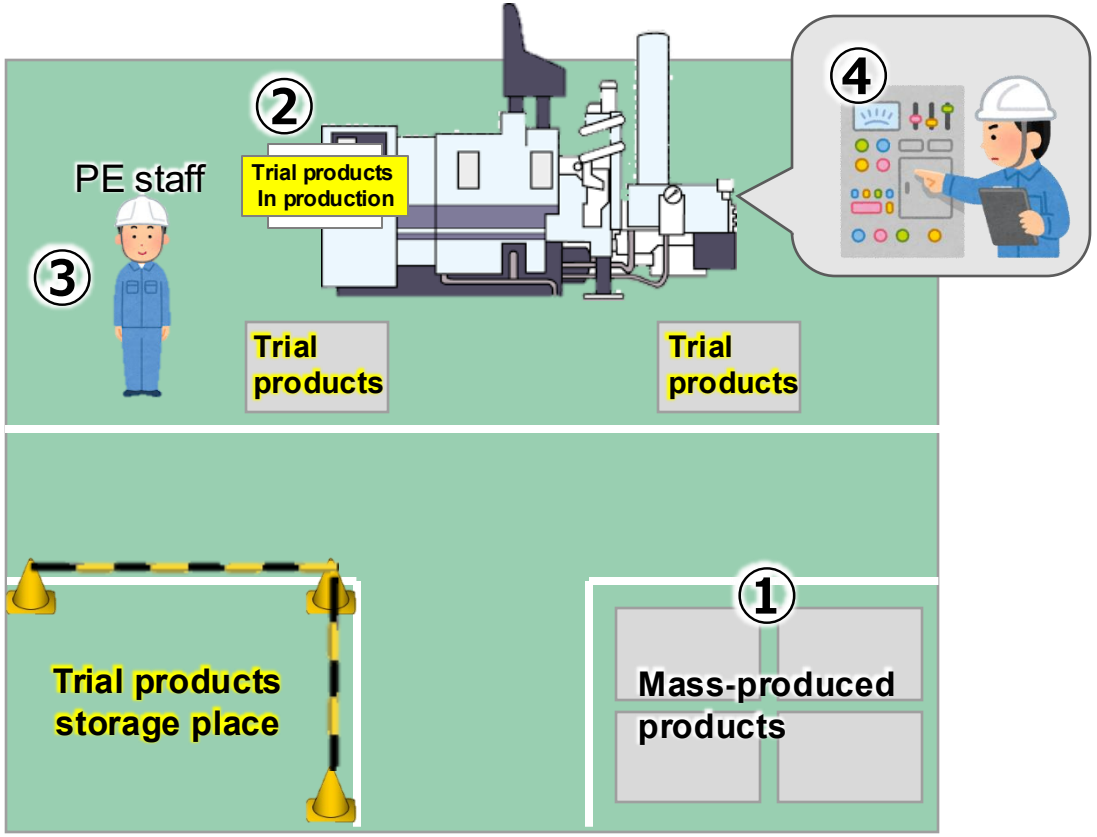
②Indicators must display that trial products are in production

③Trial production is to be conducted by the production engineering staff

④Check the return of settings after trial production etc.

Why?

➡ Since many changes occur during trial production, it is important to prevent products from mixing into those of mass-production by setting strict rules and arrangements.



5. Non-routine work standardization

5. Non-routine work standardization

1) What is “Non-routine work”?

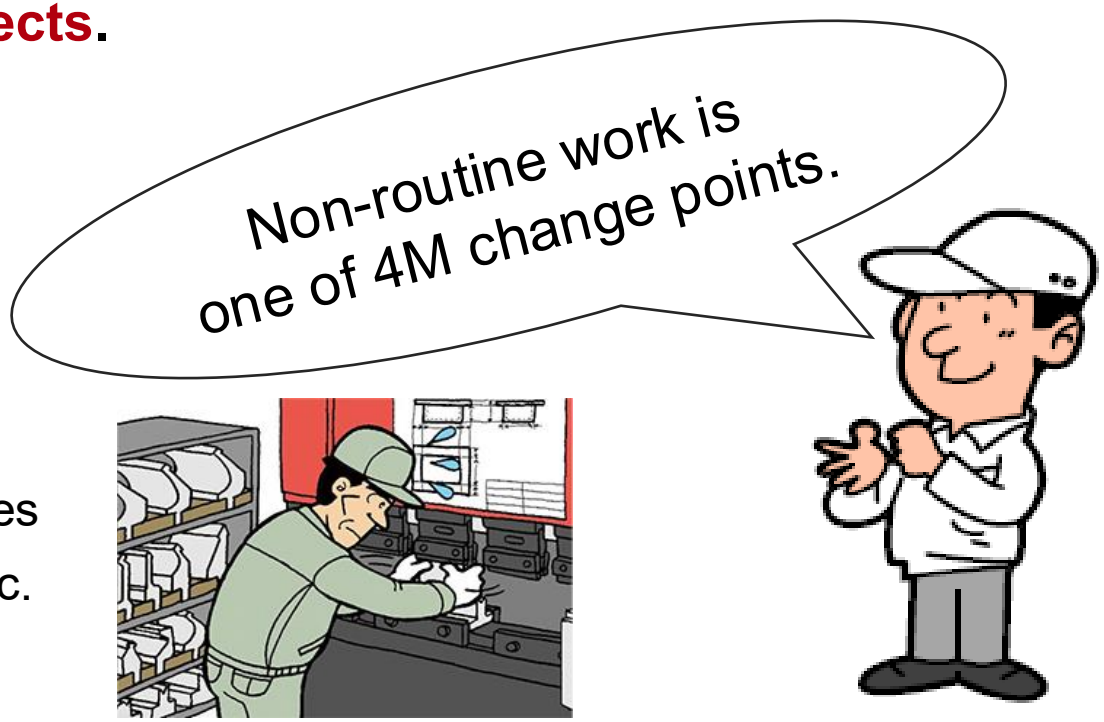
It is a work that is rarely repeated and continuous on a daily basis, and refers to maintenance and inspection work and trouble action work.

Unlike normal work (routine work), non-routine work is less frequent but has a wide variety of work items, and the person performing the work is unfamiliar with the work, **resulting in a higher frequency of quality defects**.

<Example of Non-routine work>

- Production setup due to change of production plan (Change of die, Jigs, equipment settings etc.)
- Regular maintenance
- Improvement works
- Action for the quality problems or equipment troubles

etc.



5. Non-routine work standardization

Astemo
Mobility Beyond

2) Examples of production and quality impacts by Non-routine work

Examples of the impact on production and quality caused by Non-routine works include the following cases.

Case-1: Production setup error

Because the production setup method was not standardized,,,

- ✓ **Put the wrong part together**
- ✓ **Broke the equipment**
- ✓ **Failed to detect defective products correctly**

Case-2: Product handling error

Because the treatment method for equipment troubles was not standardized,,,

- ✓ **The occurrence history was not recorded**
- ✓ **Mixed defect parts**
- ✓ **It took a lot of time to resume production**

Case-3: Interim inspection error

Because the interim inspection method for quality defect was not standardized,,,

- ✓ **The correct inspection tool was not used and the NG product could not be detected**
- ✓ **Flow of the suspect product without inspection**

There is many the impact on production and quality caused by various Non-routine work...

5. Non-routine work standardization

Astemo
Mobility Beyond

3) Non-routine work standardization and quality check

Please take the following measures to prevent quality defects due to non-routine work.

① Standardize the non-routine work

Standardize the production setup methods and routine maintenance to be able to do the same thing all the time.

Why?

➡ By standardizing, everyone can always do the same work, and work errors can be prevented.

② Record work history and quality check

Record the work history and conduct quality check after non-routine work to confirm that there are no problems.

Why?

➡ To check the retroactive confirmation of work contents.
And to confirm the accuracy of the work content and to prevent quality defects.

6. Sub-supplier management

6. Sub-supplier management

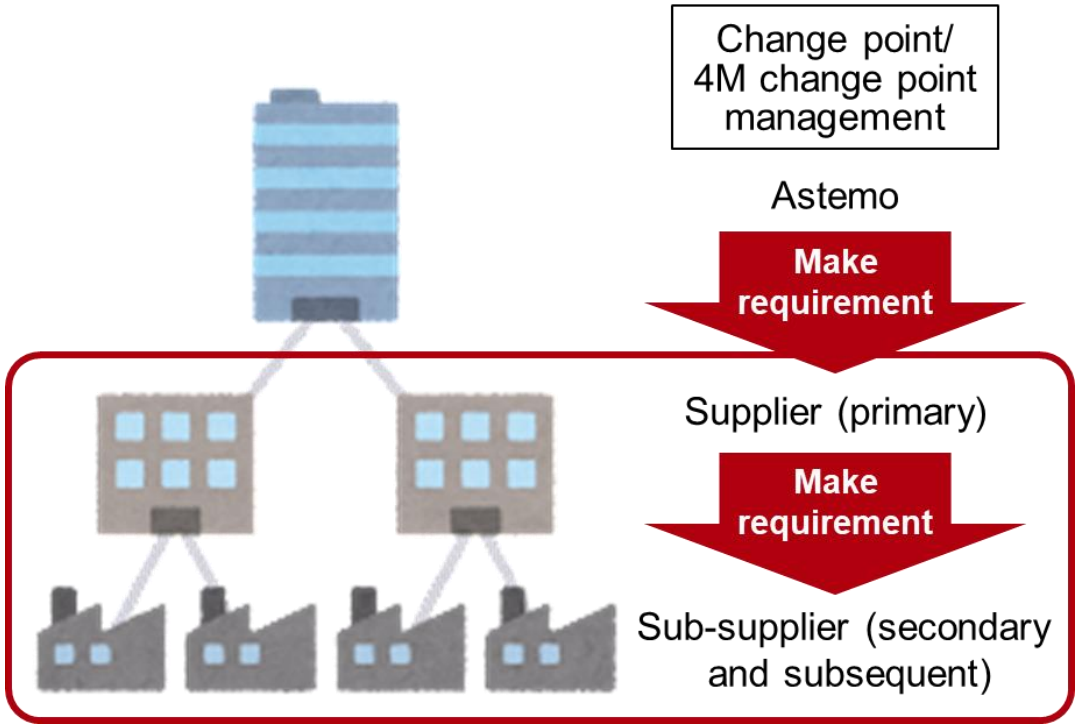
Astemo
Mobility Beyond

1) Requirement of change management to sub-supplier

Suppliers shall cascade the change management requirements (Change point / 4M change point management) requested by Astemo to their sub-suppliers and ensure that those sub-suppliers comply with Astemo's change management requirements.

In addition, please be sure to submit any change points to Astemo.

- Change point/4M change point management (including application to customer)
- On-site change management
- Initial product delivery management etc.



Why?

➡ Astemo's change management requirements are included in sub-suppliers.

To prevent quality defects due to inadequate change management at sub-suppliers.

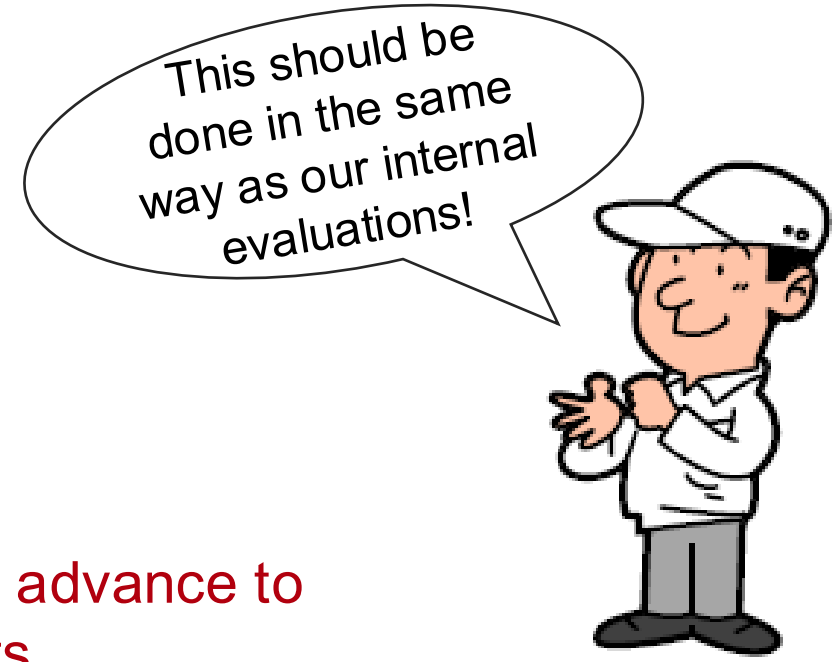
6. Sub-supplier management

2) Pre-change evaluation and process audits

When changing sub-supplier processes that affect product quality, a quality evaluation must be made before the application of the change point to assess that the change application will not be a problem. Also, conduct process audits as necessary and evaluate whether there are any problems in on-site management.

Evaluation items:

- Layout inspection ※comparison before and after change
- Process capacity verification ※comparison before and after change
- Preparation status of standards, etc.



Why?

➡ To assess validity/effectiveness of change points in advance to prevent quality defects brought on by change points.

7. Example cases of change management failure

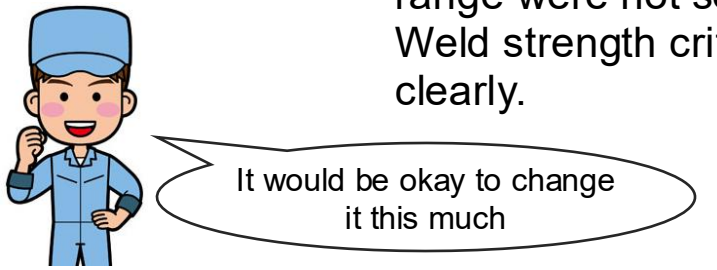
7. Example cases of change management failure

Machine
Change point

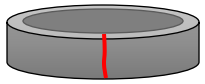
Case-1 : Setting of manufacturing condition ranges

Failure example : Weld peeling due to excessive condition adjustment

- ■ Failure : Insufficient weld strength (Peeling)
- ■ Cause (change) : Changing welding conditions (welding current)
- ■ Reason for change : Material lot change
- ■ What was lacking : Welding current target and control range were not set.
  Weld strength criteria were not set clearly.



Weld peeling



Key points of change point management

PE : Identification and setting of manufacturing conditions (Target value, control ranges)

PE : PFMEA verification

QA : Validation of inspection methods and criteria

Sales/QA : Delivery after application/approval by customer

Request to all

When setting manufacturing conditions, please set an appropriate control ranges to prevent excessive adjustments.
In addition, please verify the validity of inspection methods and criteria to ensure reliable quality.

7. Example cases of change management failure

Astemo
Mobility Beyond

Case-2 : Tool management during equipment transferring

Machine
Change point

Failure example : Machining defects due to poor tool management

- ■ Failure : Thread machining defect due to tapping tool breakage
- ■ Cause (change) : Tool life was not managed because tool counter was reset
- ■ Reason for change : Equipment transferring (in-house → outsourcing)
- ■ What was lacking : No tool management procedure during equipment transfer

Didn‘t manage the tools during equipment transfer

Tool breakage due to life

Key points of change point management

PE : Standardization of tool management during equipment transferring
P-FMEA verification

PE/MFG : Installation of tool breakage poka-yoke

QA : Validation of the screw inspection methods

Sales/QA : Delivery after application/approval by customer

Replace tool with a new one

tool breakage poka-yoke is okay !

Request to all

Please standardize tool management methods and confirmation items when transferring equipment to prevent management omissions.
In addition, please check whether the tool breakage poka-yoke is installed and is functioning properly.

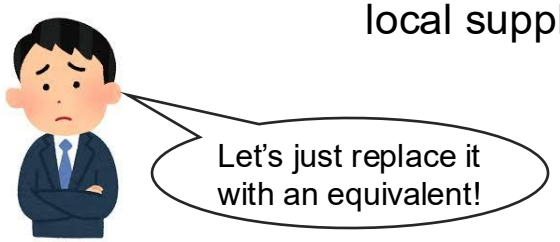
7. Example cases of change management failure

Material
Change point

Case-3 : Change of raw material manufacturer

Failure example : Insufficient verification of localized raw materials

- ■ Failure : Breakage due to lack of strength
- ■ Cause (change) : Substitution with locally procured equivalent
- ■ Reason for change : Shift to procure materials local
- ■ What was lacking : Process audits and material tests were not performed for local suppliers



Key points of change point management

Proc : Share information with relevant divisions

DE : Confirm specifications and conduct material tests

QA : Conduct process audit for local suppliers

QA : Check difference in machine characteristics before and after change
* including confirmation of strength and durability

Sales/QA : Delivery after application/approval from the customer

Strength endurance test

Request to all

Equivalent materials may differ in material composition from what is specified. When changing material manufacturers, please conduct material testing and obtain approval by Astemo.

7. Example cases of change management failure

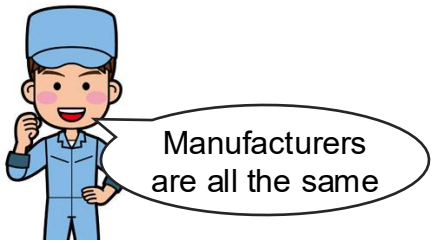
Astemo
Mobility Beyond

Case-4 : Change of sub-supplier

Method
Change point

Failure example : Failure due to change of heat treatment manufacturer

- ■ Failure : Failure in heat treatment hardness
- ■ Cause (change) : Change of heat treatment manufacturer (Tier2)
- ■ Reason for change : Insufficient production capacity of current Tier2 supplier
- ■ What was lacking : Evaluation was not conducted for the manufacturer and no check was made for the quality of heat treatment before and after the change



Key points of change point management

Proc/QA : Conduct a survey of supplier before selection

QA : Conduct process audit of supplier

QA : Check difference in product heat treatment quality before and after the change
* including strength and durability

Sales/QA : Delivery after application/approval from the customer

Request to all

Some Tier-N suppliers are unable to meet the required quality level and guarantee satisfactory quality. When changing Tier-N suppliers, please survey Tier-N supplier's capability and confirm that quality assurance can be provided.

7. Example cases of change management failure

Astemo
Mobility Beyond

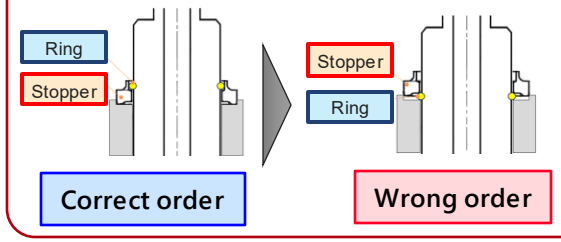
Case-5 : Returned worker after a long absence

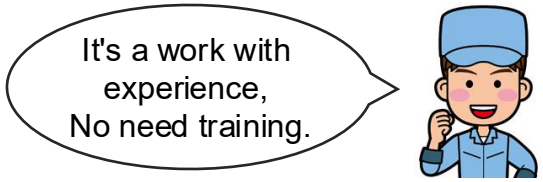
Man

4M Change point

Failure example : Assembly defects by returned worker after a long absence

- ■ Failure : Wrong order of assembling parts
- ■ Cause (change) : Returned worker after a long absence was in charge
- ■ Reason for change : Regular worker took vacation.
- ■ What was lacking? : There was a lack of worker training and work confirmation because he/she was a veteran operator.



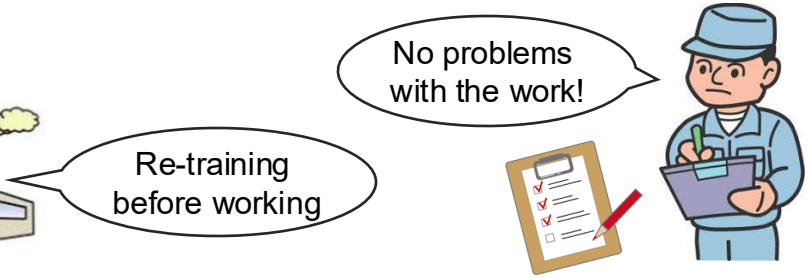


Key points of change point management

MFG : Create the work instructions
Training and work observation for returned worker after a long absence

MFG : Record of correction results

QA : Set definition of “Returned worker after a long absence”



Request to all

Even if the returned worker after a long absence has work experience, it is very dangerous to work without any training. Please be sure to conduct worker training and work observation to confirm the certainty of the work before working.

7. Example cases of change management failure

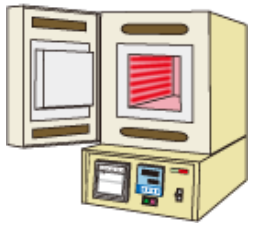
Astemo
Mobility Beyond

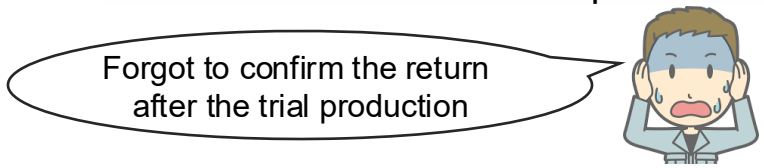
Case-6 : Forgetting to restore the manufacturing conditions after trial production

Machine
4M Change point

Failure example : Dimensional defect caused by failure to return the manufacturing conditions

- ■ Failure : Heat treatment accuracy NG
- ■ Cause (change) : Forgetting to restore the conditions after the trial production
- ■ Reason for change : Changed the manufacturing conditions for the trial production
- ■ What was lacking? : There was no rule to confirm to restore the manufacturing conditions after the trial production



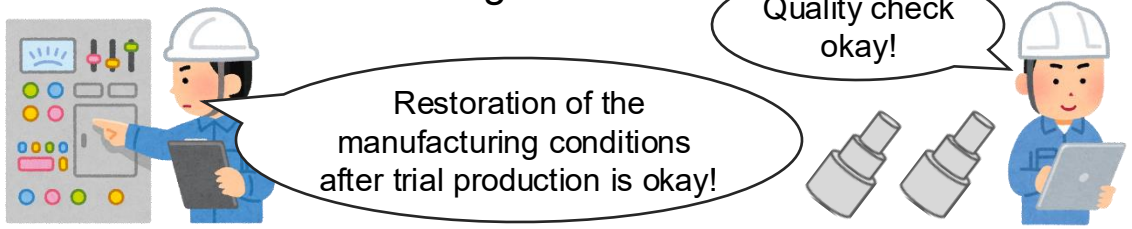


Key points of change point management

PE : Standardization and recording of check items trial production and condition restoration

PE/MFG : Recording the history of condition changes

MFG/QA : First product inspection after restoration of manufacturing conditions



Request to all

Failure to restore manufacturing conditions can lead to a large number of defects.
Please standardize the check items for trial production and condition restoration and ensure that manufacturing conditions are properly restore to prevent quality defects.

7. Example cases of change management failure

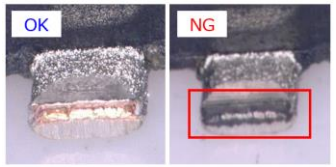
Astemo
Mobility Beyond

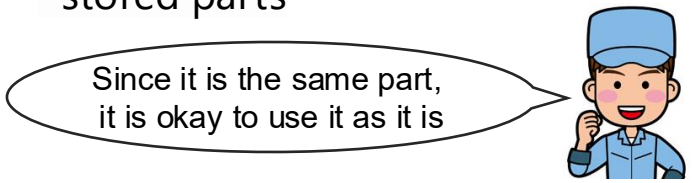
Case-7 : Insufficient quality inspection of long-stored parts

Material
4M Change point

Failure example : Soldering defect with long-stored parts

- ■ Failure : Soldering defect (Fillet NG)
- ■ Cause (change) : Inspection not performed on long-stored items (Corrosion of terminals)
- ■ Reason for change : Obtained and used the long-stored parts from another site to keep productions
- ■ What was lacking? : No incoming inspections for long-stored parts





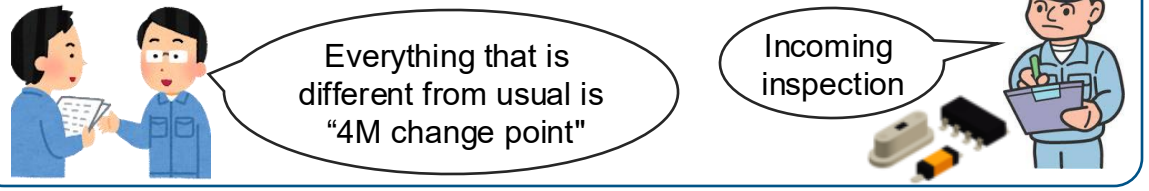
Key points of change point management

Related Dept : Recognizing the use of long-stored parts as “4M change point" and establishing a special management method

MFG : Recording usage history

MFG/QA : Establishment of handling procedure for quality defects

QA : Incoming inspection for long-stored parts



Request to all

All differences from normal production activities are “4M changing point”, and the use of long-stored parts is also one of the 4M change point. Please verify and respond to risks, such as setting up special management methods for the use of long-stored parts.

7. Example cases of change management failure

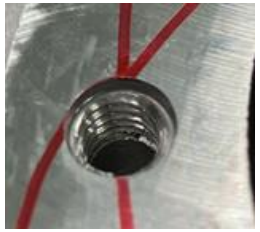
Astemo
Mobility Beyond

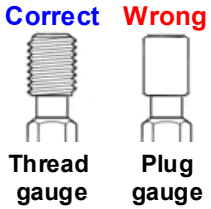
Case-8 : Non-standardization of temporary inspection methods

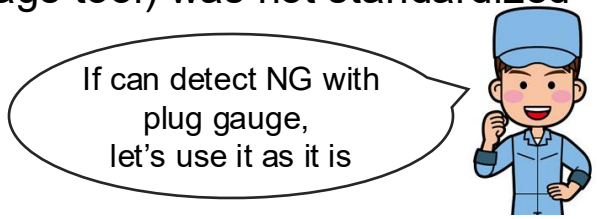
Method
4M Change point

Failure example : Outflow of NG products due to improper use of inspection tools

- ■ Failure : Outflow of thread machining defects
- ■ Cause (change) : Using a pin-gauge for thread accuracy inspection
- ■ Reason for change : Temporary inspection after finding of thread machining defects
- ■ What was lacking? : The temporary inspection method (usage tool) was not standardized







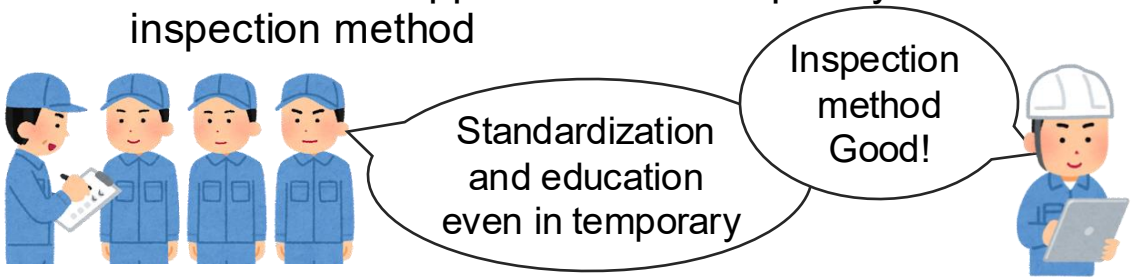
Key points of change point management

MFG/QA : Standardizing the temporary inspection methods

MFG : Education of temporary inspection methods

MFG : Recording of temporary inspection results

QA : Validation and approval of the temporary inspection method



Request to all

Even for temporary inspections such as screening for non-conforming products, it is necessary to standardize inspection methods and educate workers. In addition, please to ensure that the validation and approval of the temporary inspection method by QA Dept member.


Astemo
Mobility Beyond