

31th January 2019

## Improper Inspections, etc., in the Group

Prompted by improper inspections, such as some unmeasured inspection items in specific voluntary inspections that came to light in the Group company Sumitomo (S.H.I) Construction Machinery Sales Co., Ltd., and others (see the enclosed reference document "Disclosed Improper Actions"), on the 14th September 2018 we announced internally that we were carrying out a comprehensive survey of quality management inspections in all the company's business divisions and all group companies within Japan. As a result of these inspections it was found that improper inspections, etc., were being carried out regarding products and services in the company (Plastic Machinery Division) and in three consolidated subsidiary companies (Sumitomo Heavy Industries Material Handling Systems Co., Ltd., Sumitomo Heavy Industries Gearbox Co., Ltd., and Sumitomo Heavy Industries Power Transmission & Controls Sales Co., Ltd.), so we are continuing to check the situation while providing explanations to our customers. We report that at the present time the following facts have been established and we are dealing with the situation now and in the future as described below.

We deeply apologize for the great inconvenience caused to our customers and all those affected.

We are working to further strengthen quality management and compliance throughout the whole Group to prevent a recurrence, as well as thoroughly investigating the causes, in order to ensure that this situation will not occur again in the future.

### 1. Overview of improper inspections, etc., identified in the Group

The following is an overview of the improper inspections, etc., in the Group that were identified in the comprehensive survey of quality management inspections.

#### (1) Implementation of inspections by unqualified personnel, etc. (periodic inspections of moving walkways)

The following improper inspections were carried out in the case of periodic inspections on moving walkways implemented by Sumitomo Heavy Industries Material Handling Systems on their own products.

- Implementation of periodic inspections by unqualified personnel
- Qualified personnel who did not carry out the inspection signed the periodic inspection reports with their own name as the person that carried out the inspection
- Details were entered in the periodic inspection reports that differed from the actual inspection results

#### (2) Entering inspection data in inspection reports, etc., that was different from that agreed with the customer (large reducers and sealing press machines)

(i) Inspection data that differed from the prescribed inspection conditions was entered into inspection reports

In pre-shipment inspections of large reducers manufactured and sold by Sumitomo Heavy Industries Gearbox Co., Ltd., inspection data for some inspection items that differed from the conditions at the time of commissioning agreed with the customer was entered into the inspection report, and submitted to the customer.

(ii) Values within the customer's specification range were entered into inspection reports even though the inspection had not been implemented

In pre-shipment inspections of sealing press machines manufactured and sold by the company's Plastic Machinery Division, for some inspection items fixed values within the specification range agreed with the customer were entered into inspection reports even though the inspection had not been implemented, and submitted to the customer.

(iii) Inspection measurement values were replaced with different values that were within the customer's specification range and entered into the inspection report

In pre-shipment inspections of sealed presses manufactured and sold by the company's Plastic Machinery Division, for some inspection items fixed measurement values within the specification range agreed with the customer were replaced with other values within the specification range and entered into inspection reports, and submitted to the customer.

(3) Actual measurement values were replaced with values within the company standard values and entered into the inspection reports (overhaul of reducers)

In the overhaul of reducers carried out by Sumitomo Heavy Industries Power Transmission & Controls Sales Co., Ltd., for some inspection items measured values that were outside the company's standard values were replaced with values within the company's standard values and entered into the inspection reports. In addition measurement values within the company standard values were replaced with other values within the company's standard values and entered into the inspection reports, and submitted to the customer.

## 2. Status of Confirmation of Safety and Product Performance

At the present time there have been no identified occurrences of faults caused by the improper inspections, etc., in the company and the three consolidated subsidiaries

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### (1) Traveling Walkways

Inspections have been carried out by qualified personnel at all the facilities with the affected equipment, 4 equipment. at 3 companies, and it has been confirmed that the safety of the users has being ensured.

(i) Regarding the periodic inspections carried out by unqualified personnel on the two equipment at one company, it was confirmed that the recent periodic inspections were carried out by appropriately qualified personnel.

(ii) In addition to the implementation of periodic inspections by unqualified personnel, regarding the false entries in reports for two equipment at two companies, the most recent periodic inspection was by unqualified personnel, so the inspection was appropriately performed again by qualified personnel, and the customer appropriately dealt with.

## (2) Large Reducers

Regarding these products, as a result of an analysis based on the records of other related quality control items, it was judged that the quality standards agreed with the customer were satisfied.

## (3) Sealing Press machines

(i) Regarding the items for which inspection was not implemented, as a result of inspections of the relevant products shipped after this incident came to light, it was inferred that the products were sufficiently within the specification range. However in cooperation with the customer confirmation of the individual product performance is in progress.

(ii) Regarding the inspection items for which values differing from the measured values were entered into the inspection reports, the measured values have all been checked, and it has been confirmed that they are all within the specification range agreed with the customer.

## (4) Reducers

(i) Regarding reducers used for equipment such as ski lifts, etc., a safety evaluation has been carried out by the customer and it was confirmed that there is no problem.

(ii) Regarding reducers used in equipment such as belt conveyors, etc., confirmation of product performance is proceeding promptly.

Note that after overhaul, reducers are assembled again into the end-users' equipment and commissioning tests are carried out, and operation is started after confirmation of performance. Also, as a result of daily inspections and periodic inspections, etc., carried out by the end-users, it has been confirmed that there has been no problem.

## 3. Policy Regarding Future Measures

In the fact-finding and safety verifications carried out within the Group to date, no non-conformities that would give rise to doubts about the safety of our products have been confirmed. However, having provided explanations to our customers and obtained their understanding, we are proceeding with further measures such as verification of safety, etc. If any concerns regarding safety are identified, they will be promptly and appropriately dealt with.

Also, although fact-finding is proceeding within the company, on 15th January 2019 a Special Investigation Committee was established with an external director as Chairperson, and this Committee will carry out an investigation to identify the history and causes, and to provide advice on measures to prevent recurrence. Based on the results of this investigation by the Special Investigation Committee, the company will implement measures to further strengthen quality control and compliance within the Group and to prevent a recurrence of such incidents in order to restore confidence. Also, after these measures have been determined they will be made public.

## 4. Effect on Business Results

The incidents that have already been made public have not affected business results.

Also, when the effects on business results of the incidents that have now been disclosed have become apparent, there will be a further separate public announcement.

## 5. Status of Measures within the Company

The status of measures within the company's Plastic Machinery Division is as follows.

### (1) History

During the comprehensive survey of quality management inspections in the whole company, a survey was carried out of one year's test reports of pre-shipment inspections of sealing press machines. As a result of this survey it was found that in the spreadsheet software programs used for preparation of the test reports, there were inspection items that had not been implemented and there were values that differed from the actual measurement results, so it was concluded that these were improper inspections.

### (2) Details of the Incidents

#### (i) Overview of the improper inspections, etc.

Among the pre-shipment inspections of sealing press machines, it was found that there were cases where some inspection items had not been carried out, but nonetheless fixed results within the specification range agreed with the customer had been entered onto the test reports and submitted to the customer. In addition there were cases where the actual measurement values from the inspection were replaced with different values within the specification range, entered into the inspection report, and submitted to the customer. The number of customers that were affected by these improper inspections was 4, and the total number of improper inspections was 214.

#### (ii) Cause of Occurrence

- Those responsible produced a program that output values different from the values calculated from the input inspection data on the spreadsheet software for preparation of the test reports, and they used this program.
- Those responsible had not discussions with the customer regarding specification changes, carelessly thinking that there was no problem to omit inspection items in terms of product function or performance.
- Those responsible made the arbitrary judgment that because the measured values were within the specified range, there was no problem to enter constant values within the specified range onto the test reports.
- The Quality Assurance Department were unaware of the fact that those responsible had replaced the spreadsheet software program, so they checked whether or not the data in the test reports were outside specification, but they did not carry out a check with the measured values. Therefore they were unable to detect that there had been improper inspections.

#### (iii) Status of Confirmation of Product Performance

At present there have been no occurrences of faults in products caused by these incidents.

Regarding the items for which inspection had not been carried out, from the inspection results on the relevant products shipped after these incidents came to light, it has been inferred that they were sufficiently within the specification range, but in cooperation with the

customers confirmation of the performance of the individual products is in progress. Also for the inspection items for which values that differed from the measured values were entered in the test reports, all the measured values have been checked, and it has been confirmed that they are within the specification range agreed with the customer.

(iv) Annual Number Shipped and Annual Revenue of Products in Question

Annual number shipped: 267                      Annual revenue: About ¥1.2 billion (FY 2017)

### (3) Current Status of Measures

Apologies and explanations have been given to the four customers affected, and discussions are being carried out with them individually regarding future measures.

At present inspections are being carried out on all the items based on the specifications agreed with customers, and, modification of the spreadsheet software programs have been completed so that the inspection data is correctly entered into the test reports.

### (4) Policy Regarding Future Measures

Rules have been established regarding the procedures for preparation and changes of test reports, and retraining is being implemented to ensure thorough compliance of those involved, as well as implementation of work control methods relating to review and approval.

We are putting our total efforts to prevent a recurrence and to recover trust so that such incidents do not occur again.

Also, today the three subsidiaries are making public announcements regarding the status of their measures, and for details refer to the attached documents 1 to 3.

End

[Reference] Summary of Incidents at Each Company

1. Sumitomo Heavy Industries, Ltd. (Plastic Machinery Division)

Relevant product or service	Sealing press machines
Main uses	Part of automatic molding devices within semiconductor assembly processes
Survey period	1st November 2017 to 31st October 2018
No. improper inspections, etc.	214
No. customers affected	4

2. Sumitomo Heavy Industries Material Handling Systems Co., Ltd.

Relevant product or service	Periodic inspection of moving walkways
Main uses	Movement of pedestrians
Survey period	1st April 2013 to 30th November 2018
No. improper inspections, etc.	4
No. customers affected	3

3. Sumitomo Heavy Industries Gearbox Co., Ltd.

Relevant product or service	Large reducers
Main uses	Electrical power generation equipment, compressors, etc.
Survey period	1st October 2017 to 30th September 2018
No. improper inspections, etc.	41
No. customers affected	7

4. Sumitomo Heavy Industries Power Transmission & Controls Sales Co., Ltd.

Relevant product or service	Overhaul of reducers
Main uses	Drive devices for ski lifts, etc., belt conveyors for industrial use, etc.
Survey period	1st October 2017 to 30th September 2018
No. improper inspections, etc.	29
No. customers affected	15

Improper Inspections, etc. in the Company

It has come to light that improper inspections such as inspections carried out by unqualified personnel, etc., have been carried out during the periodic inspection of moving walkway equipment implemented by our company (President: Tatsuya Endo, Capital: ¥480 million), and the following is a report on the status of our measures to deal with these problems.

We deeply apologize for the great inconvenience caused to all of those affected by these incidents. The company is putting its efforts into strengthening the quality control systems in order to prevent a recurrence of such events in the future.

1. History

In the comprehensive quality control survey conducted by the Sumitomo Heavy Industries Group, a survey was conducted of our company for one year, and subsequently the survey was conducted for a further year in FY 2013. As a result of these surveys it was found that improper inspections have been carried out, such as the implementation of inspection by unqualified personnel in the periodic inspections of moving walkways, etc.

2. Details of the Incidents

(1) Overview of improper inspections, etc.

For some of the owners of moving walkway equipment, the Building Standard Act imposes an obligation to carry out periodic inspections annually by personnel that have received a certificate of qualification as an inspector of elevators, escalators, etc. (hereafter, "qualified personnel"), and to submit the periodic inspection report to the designated competent authority. However in the periodic inspections carried out by us based on a commission from the owners of the equipment, it was found that the following improper inspections had been carried out. These improper inspections applied to 4 equipment at 3 companies.

(i) Implementation of periodic inspection by unqualified personnel

The periodic inspections were not carried out by our company's staff members that were qualified, but were carried out by a cooperating company consisting of unqualified personnel only.

(ii) Entering the name of a different inspector on the periodic inspection reports

When the inspections were carried out by unqualified personnel, a qualified person from our company who had not carried out the inspection signed their own name to the periodic inspection report as the inspector.

(iii) Entering the name of a different inspector and different inspection results on the periodic inspection reports

When inspections were carried out by unqualified inspectors, there were cases in which in addition to entering the name of a different inspector, inspection results that differed from the actual inspection results were also entered into the periodic inspection reports.

## (2) Cause of occurrence

(i) As a result of entrusting the work of periodic inspection of moving walkways to each of the responsible personnel and cooperating companies, the manager did not understand the actual situation regarding the plan for deployment of the staff and carrying out the work, including the qualified personnel and the cooperating company. Also, there was no mechanism or system whereby the manager would check and approve the contents of the report submitted to the customer or the periodic inspection report submitted to government.

(ii) The personnel responsible incorrectly interpreted that even if they did not carry out the actual inspection themselves, provided that qualified personnel checked the inspection results then the inspection would be valid, so there was no thorough compliance.

## (3) Status of checking of safety

Inspections have been carried out as described below by qualified personnel at all the 4 equipment at 3 companies where the improper inspections have been carried out, and it was confirmed that safety of the users was ensured.

(i) In the case of the 2 facilities at 1 company where periodic inspection was carried out by unqualified personnel, it has been confirmed that the most recent periodic inspection has been carried out by properly qualified personnel.

(ii) In addition to implementation of periodic inspections by unqualified personnel, in the case of 2 facilities at 2 companies where there was wrong information entered on the reports, the most recent periodic inspections had been carried out by unqualified personnel, so reinspection was appropriately carried out by qualified personnel and the reports were submitted again, so appropriate measures were taken for the customer.

## (4) Annual revenue for the relevant services

Sales of moving walkways were terminated in June 2008, and thereafter maintenance and servicing has been carried out only for equipment already installed.

Annual revenue from maintenance and servicing: About ¥300 million (FY 2017)

## 3. Policy Regarding Future Measures

The customers for whom the improper inspections were carried out have been given apologies and reports. In addition as measures to prevent a recurrence, education on the relevant laws and regulations and on compliance has been provided, control of qualified personnel is being thoroughly implemented, and review of the series of processes from planning, implementation, records, reporting, etc., has been carried out. These measures to prevent recurrence are being implemented with our total commitment, in order to restore confidence in the company.



Sumitomo Heavy Industries Gearbox Co., Ltd.

Improper Inspections, etc. in the Company

It has come to light that in our company (President: Tatsuro Araki, capital: ¥840 million) improper inspections, etc., have been carried out for some of the inspection items in the pre-shipment inspections for large reducers, and the following is the status of our response to deal with these incidents.

We deeply apologize for the great inconvenience caused to all those affected by these incidents. The company is strengthening its quality control system in order to prevent an occurrence of such incidents in the future.

1. History

In the comprehensive quality control survey conducted by the Sumitomo Heavy Industries Group, as a result of a survey carried out in our company for one year, it came to light that there were some differences between the in-house "inspection records" that contained the measurement results of pre-shipment inspections of large reducers, and the values in the "inspection reports" submitted to customers, so there were improper inspections.

2. Details of the Incidents

(1) Overview of the improper inspections, etc.

There were cases in which bearing temperature data that was not measured was entered into the inspection results document during in-house commissioning, and, measured values of noise that were outside the in-house standard values were replaced with values within the in-house standard range and entered into the inspection results report, and submitted to the customers. The number of customers affected by these improper inspections, etc., was 7, and the number of improper inspections, etc., was 41.

(2) Cause of occurrence

Regarding non-compliance with the conditions of bearing temperature during in-house commissioning, there were times when it was not possible to secure the commissioning time agreed with the customer, or the approved commissioning time agreed with the customer was mistaken.

Regarding the falsified noise values, in cases where it was not possible to insulate the surrounding noise it was not possible to correctly measure the data, so values within the in-house standard range of values were wrongly entered.

In past quality audits, the inspection records and the inspection reports were not checked, so it was not possible to detect the mismatch of the values.

(3) Status of checking of product performance

At present there have been no product faults, etc., that have been caused by these incidents.

Regarding non-compliance with the conditions of bearing temperature during in-house commissioning trials, analysis has been carried out based on other related quality control item records, and it is been found that the results satisfy the quality criteria specified by the customer.

Also, the occurrence of noise associated with product performance can cause abnormal results in other measurement values (temperature or vibration), but such faults have not been detected.

(4) Annual number of shipments and annual revenue for the affected products

Annual number of shipments: 504    Annual revenue: About ¥1.5 billion (FY 2017)

### 3. Current Status of Measures

Explanation of the situation to the 7 customers to whom the affected products have been delivered has been completed.

When we have been asked to go to the end-user and provide an explanation, we have dealt with it successively and obtained their understanding.

### 4. Policy Regarding Future Measures

(1) We will introduce automatic recording equipment so that measurement data is automatically recorded, thereby eliminating the scope for improper inspections, etc.

(2) The whole company is involved in urgent measures to improve our work quality, in order to recover the trust of our customers.

### Improper Inspections, etc. in the Company

It has come to light that improper inspections have been carried out in connection with some of the inspection items in reducer overhaul carried out by the Service Department in our company (President: Norio Okada, Capital: ¥400 million), and the following is the status of our actions to deal with these.

We deeply apologize for the great inconvenience caused to those that have been affected by these incidents. We are working to strengthen our work quality in order to prevent a recurrence of such events in the future.

#### 1. History

In the comprehensive quality control inspection carried out by the Sumitomo Heavy Industries Group, a survey was carried out for one year in our company, and as a result it came to light that some of the values on the "Checklist" that contains the measured values during reducer overhaul and the values on the "Inspection Report" submitted to the customer were different, so improper inspections were carried out.

Note that overhaul is carried out in order to maintain the function of the equipment and to extend its life, and the content of the work carried out by our company included dismantling, inspection, replacement of parts, etc., on reducers.

#### 2. Details of the incidents

##### (1) Overview of the improper inspections, etc.

In the specific inspections carried out during reducer overhaul, measured values that were outside the in-house standard values were replaced with values within the in-house standard values and entered into the inspection reports. In addition, measurement values that were within the in-house standard values were replaced with different values within the in-house standard values, and entered in the inspection reports and submitted to the customers.

The number of customers affected by these improper inspections was 15, and the number of improper inspections was 29.

##### (2) Cause of occurrence

(i) The performance of the customer's equipment is confirmed by commissioning tests, so it was wrongly judged that there was no problem if measurement values were outside the in-house standard values, so the values on the inspection reports were replaced.

(ii) Management of the standards and processes to ensure quality was not thorough, and there were defects in the system of reviewing and approving in some departments, so the

system did not function. Also, audits of the periodic service bases did not extend to determine the state of work quality.

### (3) Status of checking of product performance

At present there have been no product defects, etc., that have been caused by these incidents.

In the case of products that are used in ski lifts and other equipment, the product performance has been confirmed in the company, and it has been confirmed that there are no problems. In the case of products used in belt conveyors, etc., we are urgently carrying out checks. Note that after being overhauled the reducers are assembled again into the end-user's equipment and operational tests are carried out, and after the performance has been confirmed operation is commenced. Also, the end-users check that there are no problems in daily inspection and periodic inspection, etc.

### (4) Annual number of products overhauled and annual revenue

Annual number of products overhauled: 761      Annual revenue: About ¥900 million (FY 2017)

## 3. Current Status of Measures

The company has re-confirmed that there are no problems in the performance of all of the reducer products that were affected.

Also, explanations regarding the improper inspections have been provided to the 2 ski lift equipment manufacturers, and safety evaluations have been carried out and it has been confirmed that there is no problem. Note that explanations are being provided successively to the 13 industrial belt conveyor manufacturers and end-users.

## 4. Policy Regarding Future Measures

(1) Prompt and proper explanations will be provided to customers regarding the facts of any improper inspections that come to light in the future, and the problems will be resolved in a manner that is convincing to the customer.

(2) After further surveys regarding the facts, we will search for the causes, and establish and implement measures to prevent recurrence.

(3) The whole company is engaged in measures to increase work quality for overhauling, in order to restore trust of the customers.

	Sumitomo Heavy Industries Himatex Co., Ltd.	SUMITOMO (S.H.I.) CONSTRUCTION MACHINERY Group		Sumitomo Heavy Industries Construction Cranes Co., Ltd.	Sumitomo Nacco Forklift Group	
[Product]						
Product name: use	Mill rolls: Consumable items used in rolling mills, production equipment for producing steel products specified by customers, at steel manufacturers such as blast furnaces, electrical furnaces, etc.	Construction machinery: Asphalt finishers, rollers, snow removal vehicles, forklifts, etc.  * As a service company also handles OEM equipment and other company's equipment.	Construction machinery: Hydraulic shovels, forklifts, bulldozers, tractor shovels, machinery for foundation engineering, pavement compaction machinery, aerial work platforms, etc.  * As a service company also handles OEM equipment and other company's equipment.	Large special vehicles (trucks such as tracked cranes, etc.), among mobile cranes, tracked cranes, wheeled cranes, all-terrain cranes, etc. (41 types, but at present production and sale is terminated)	Engine type forklifts (large special vehicles with vehicle inspection certificate): Loading vehicles equipped with forks on the front of the vehicle that load and unload using hydraulics.	Forklifts, etc.: Vehicles equipped with forks on the front of the vehicle that load and unload using hydraulics.
End-user	Steelmakers with rolling Mill equipment	Civil engineering construction, road construction	Civil engineering construction, road construction, on site transport, etc.	Building and civil engineering contractors, heavy lifting operations, etc.	In manufacturing factories, warehouses, distribution centers, etc.	In manufacturing factories, warehouses, indoor and outdoor operations
Revenue for the relevant products (FY 2017)/ revenue for the division (FY 2017)	¥2.9 billion (Japan ¥2.6 billion, overseas ¥300 million) / ¥4 billion (Sumitomo Heavy Industries Himatex Co., Ltd. non-consolidated)	¥57.1 billion (Sumitomo (S.H.I.) Construction Machinery Sales Co., Ltd. non-consolidated) / Construction machinery segment ¥260.5 billion	¥10 billion (the service business) / ¥57.1 billion (Sumitomo (S.H.I.) Construction Machinery Sales Co., Ltd. non-consolidated) / Construction machinery segment ¥260.5 billion	¥200 million (servicing this type of machinery only)/¥38.4 billion	¥200 million (sale of large special vehicles within Japan, inspection and maintenance) / Sumitomo Nacco Group consolidated ¥32.5 billion	¥2.3 billion (specific voluntary inspections, ancillary equipment implemented at the same time) / Sumitomo Nacco Group consolidated ¥32.5 billion
Year of commencement of business	1951	2001		2002 (Change of company name due to change of share ownership: 2018)	1970	
Present improper inspections	[Disclosed 1st October 2018]	[Disclosed 20th June 2018]	[Disclosed 24th August 2018]	[Disclosed 20th June 2018]	[Disclosed 20th June 2018]	[Disclosed 27th July 2018]
Details of improper actions	Values that were different from the actual inspection results were entered on the inspection reports, etc.	Improper dismantling and maintenance in accordance with the Road Trucking Vehicle Act	Measurements were not carried out in specific voluntary inspections, and standard values, etc., were entered	Improper dismantling and maintenance in accordance with the Road Trucking Vehicle Act	Improper dismantling and maintenance in accordance with the Road Trucking Vehicle Act	Measurements were not carried out in specific voluntary inspections, and standard values, etc., were entered
Number of improper events/number of events surveyed	9,457 / 11,277	Defective dismantling and maintenance 109 vehicles, 113 events Records not issued, etc. 135 vehicles, 159 events / 569	3,612 vehicles / 10,304 vehicles	2 / 94 (number of maintenances for the relevant types of vehicle)	Defective dismantling and maintenance 140 vehicles, 182 events Records not issued, etc. 197 vehicles, 244 events / 226 vehicles	26,288 vehicles, 76,379 events / 26,288 vehicles
No. customers affected by these events, No. Items delivered	Blast furnace and electrical furnace Manufacturers within Japan 35 companies 82 factories, overseas 30 companies 35 factories, total 65 companies 117 factories	-	-	No. Vehicles managed by the company within Japan 280	90 companies	8,080 companies
Period of the delivery of products affected by these events	1st April 2015 to 30th September 2018	-	-	June 1992 to March 2013 production and sales terminated	March 1987 to February 2018	January 1980 to September 2017
Period of investigation of these incidents to date	1st April 2015 to 30th September 2018	1st May 2016 to 31st May 2018	1st August 2017 to 31st July 2018	1st May 2016 to 30th April 2018	1st May 2016 to 30th April 2018	1st July 2017 to 30th June 2018

Plan for future investigations of these incidents	Depending on requests from customers	(All completed)	(All completed) (Note that some loading tests among the periodic voluntary inspections that came to light in the course of investigating these incidents have not been carried out, but they are currently being dealt with)	(All completed)	(All completed)	(All completed)
No. safety or product performance confirmations completed	Regarding product performance, it has been confirmed that the customer's quality standards have been satisfied at 57 factories within Japan (70%), and 13 factories overseas (37%)	All implemented	All implemented	All implemented	All implemented	All implemented