

NSK Q 002

MATERIAL SUPPLIER

QUALITY ASSURANCE MANUAL

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December 13, 2001

NSK Ltd.

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MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL

[I] Basic Requirements for Quality Assurance

1. Scope

This quality assurance manual specifies the basic requirements for the quality assurance with each material supplier (hereinafter called supplier) who supplies goods to NSK Ltd. (hereinafter called NSK).

This quality assurance manual is intended to assure 100% non-defective products by establishing a companywide quality assurance structure to ensure quality, cost, and timely deliveries in accordance with NSK's basic policies. In this manual, "quality assurance" shall be regarded as the objective, and "quality control" as the means to achieve it.

The "Material", as used herein, includes bars, tubes, rods, and sheets of iron and steel, nonferrous metals, and non-metallic materials such as plastics.

2. Basic Requirements for Quality Assurance

2.1 Responsibility for Quality Assurance

Each supplier shall bear full responsibility for quality assurance in the production of materials to be supplied to NSK. To help assure the quality of all products, the supplier shall assign a person to be in charge of quality assurance and report the details to NSK.

2.2 Establishing Quality Assurance Systems (Organization and Function)

Each supplier shall establish a quality assurance system with which they are able to ensure quality that conforms to NSK's drawings and purchasing specifications (PS) throughout the entire production process, and strive to maintain and improve it.

2.3 Quality Control Procedures

Suppliers shall establish procedures to ensure quality control for each of the following items and closely follow them.

(1) Control of Specifications, Drawings, etc.

For NSK's drawings and purchasing specifications and the supplier's standards,

drawings, etc. for production and inspection, the latest ones shall be filed and maintained in appropriate places and regularly revised or discarded.

(2) Control of Equipment and Measuring Instruments

For production and inspection, the equipment and measuring instruments necessary to secure the desired quality shall be provided, and maintained in good condition at all times. Especially for testing, calibration or inspection, adequate controls and time limits shall be determined and observed.

(3) Technical Capabilities of Operators and Inspectors

Operators and inspectors who have sufficient technical capability for production and inspection shall be utilized. Also, the necessary education and training shall be systematically provided.

(4) Control of Subcontractors

In order to ensure the capability of subcontractors, the necessary controls shall be established and enforced for the selection of suitable suppliers, quality checks, etc.

(5) Lot Control (Charge Control)

For all materials, lot controls shall be clear and definitive. Lot controls are generally maintained for major processes such as melting, rolling, and heat treatment in order to stabilize quality and detect defective materials early. Adequate quality records shall be kept.

(6) Control of Production Processes

In order to secure the desired quality, inspections and tests shall be made at the specified control points during production in accordance with the Production Process Control List or Inspection Standard on the basis of the Purchasing Specifications. For critical control processes, great importance shall be attached to it and special controls shall be observed.

(7) Process Change Control

The process change shall be checked with not only the competent department but also the relative departments for the influence due to change by establishing a certain rule in advance. The data of old/new process shall be compared and checked, and shall confirm for difference between old and new products but not for compliance with the standard. Prior to process change, the process change

application shall be submitted to NSK for approval according to the Procedure IV.

(8) Initial Product Control

When starting mass production of a new material or trial manufacture of a material and when changing processes during mass production, sufficient study and preparations of process controls shall precede production in order to secure the proper quality and to stabilize production early.

(9) Control of Defective Materials

Defective products shall be clearly distinguished, and the storage area shall be suitably located to prevent outflow.

(10) Handling of Abnormalities

1) The procedure for handling abnormalities when they occur during production shall be clarified.

2) When the defective materials have been supplied to NSK or when there is such a possibility, the supplier shall notify NSK of the details immediately.

3) The method of disposal of abnormal materials shall be recorded and stored.

The instant that an abnormality is detected, stop production and take the necessary countermeasures, then segregate the abnormal lot from the rest.

These two rules shall be understood by all the operators.

(11) Controls to Prevent Different Materials from Becoming Mixed

When two or more types of materials with similar dimensions flow between production processes, the materials shall be clearly distinguished, and every possible means shall be used to prevent different materials with similar dimensions from becoming mixing.

(12) Control of Critical Materials

For critical materials (materials for safety related products, materials for special products designated by laws or regulations, materials for specially designated products, and materials for other products requiring additional controls), special controls shall be established in accordance with the standards designated by NSK.

3. Quality Control Procedures

Suppliers shall follow each of the following procedures. Procedures 3-4 and 3-6 should be done immediately every time it is called for. For other items, follow NSK's instructions.

3-1. Registration of persons in charge of quality assurance

3-2. Preparations of Inspection Standards

3-3. Preparation of Production Process Control List

3-4. Process Change procedure

3-5. Initial product control procedure

3-6. Disposition when defects occur

3-7. Subcontractor Utilization Report

3-8. Quality Control Status Report for Critical Control Processes

For the forms needed for these procedures, copy the forms in this report.

4. Submitting Inspection Reports

Each supplier shall submit an Inspection Report for each lot (change) delivered to NSK. If a special form is specified in the Purchasing Specifications, etc., follow the form.

5. Plant Visits and Attendance During Inspections

NSK shall periodically or whenever NSK believes it is necessary, visit suppliers' plants or attend inspections.

3rd Version Revised on December 13, 2001

2nd Version Revised on July 25, 1986

1st Version Established on February 10, 1981

NSK Ltd.

Quality Assurance Division

MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL

[2] Procedures for Quality Control

Procedure 1. Registration of Persons in Charge of Quality Assurance

1. Scope

This quality assurance manual specifies the procedure whereby suppliers inform NSK of the persons in charge of quality assurance.

2. Purpose

Suppliers shall inform NSK of the persons in charge of quality assurance to facilitate smooth cooperation concerning the various matters for quality assurance for the supplied materials.

3. Responsibility and Selection of Persons in Charge of Quality Assurance

The manager of quality assurance shall be fully responsible for all quality assurance operations by the supplier. For the selected person, a leader in the quality assurance department is preferable.

4. Selection of Assistant manager of Quality Assurance

(1) The person in charge of operations (Chief of the Quality Assurance Division) who is in a position to take effective action shall be assigned to be the Assistant manager of Quality Assurance.

(2) In the case of a trading firm, the person in charge of quality assurance at the manufacturer's mill shall be assigned to be Assistant manager of Quality Assurance.

5. Reporting Procedure

Suppliers shall enter the name of the company, company seal, office, name, stamp, phone number for contact, and date of selection of the Manager and Assistant Manager of Quality Assurance in the "Selection or Alternation or Quality Assurance Manager Report" shown in Form 1, and submit it to NSK's quality Assurance Division.

For the Assistant Manager of Quality Assurance, enter the name of the plant under his supervision or the manufacturer.

6. Alteration Report Procedure

When there is an alteration in the Manager or Assistant Manager of Quality Assurance due to a change in the supplier's organization or for other reasons, encircle "Alteration" on the Selection or Alteration of Quality Assurance Manager Report as shown on Form 1 and submit it to NSK's Quality Assurance Division using the same procedure as in item 5.

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NSK Ltd.

To: Manager, Quality Assurance Division

Issue No.	
Issuing date	
Name of company	
Office	
Issuers	

Selection or Alteration of Quality Assurance Manager Report

We inform you that we selected/changed the manager of Quality Assurance as follows:

Manager of quality assurance	Name of office	
	Name	
	Phone No. for contact	
	Selection/Change date	
Assistant manager of quality assurance	Name of office	
	Name	
	Phone No. for contact	
	Selection/change date	
	Plant under his supervision or manufacturer's	
	Location	
Assistant manager of Quality assurance	Name of office	
	Name	
	Phone No. for contact	
	Selection/change date	
	Plant under his supervision or manufacturer's	
	Location	

NSK Q 002 Form 1

MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL

Procedure II Preparation of Inspection Standards

1. Scope

This quality assurance manual specifies the methods to prepare and submit Inspection Standards for materials to be supplied to NSK by suppliers.

2. Purpose

The purpose is to clarify the inspection procedures used by suppliers to ensure the final quality of materials.

3. Preparation Procedures

The Inspection Standards should generally be prepared using one sheet for each type of materials with a given shape and size. For certain common items, however, these may be prepared using a single sheet.

4. Format

Form 2 is a reference form for Inspection Standards. However, the format normally used by the supplier may be used if it satisfies the contents of the reference form.

5. Submission and Approval

5.1 Submission

If the supplier is requested by NSK in the Purchasing Specifications, etc. to submit Inspection Standards, the supplier shall submit them in duplicate to the Quality Assurance Division of NSK before the products are delivered.

5.2 Approval

The Chief of the Quality Assurance Division of NSK shall sign them to indicate approval after checking the details and return one copy to the supplier. For the submitted Inspection Standards, NSK shall handle them with care.

6. Re-submission due to Alteration

When there is an alteration in the Inspection Standards, re-submit the new Inspection Standards immediately. For handling alterations in processes, refer to Procedure IV, "Process Alteration Procedure".

MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL
Procedure III Preparation of Production Process Control List

1. Scope

This quality assurance manual specifies the methods to prepare and submit Production Process Control Lists for materials to be supplied to NSK by suppliers.

2. Purpose

Each supplier should prepare Production Process Control Lists clearly showing the quality assurance methods used in each material production process by the Inspection and Production Divisions in order to have an overall understanding of the quality assurance activities in all production processes.

3. Preparation Procedure

The Production Process Control List should generally be prepared using one sheet for each type of materials of a given shape and size. For certain common items, however, these may be prepared using a single sheet.

4. Format

Forms 3 and 3A are reference forms for production process control lists. However, the format used by the supplier may be used if it satisfies the contents of the reference forms. In the Process column on the list, the supplier may enter the process diagram symbols of JIS Z 8206 and define them.

5. Submission and Confirmation

5.1 Submission

If the supplier is requested by NSK in the purchasing Specifications, etc. to submit Production Process Control Lists, the supplier shall submit them in duplicate to the Quality Assurance Division of NSK before any products are delivered.

5.2 Confirmation

The Chief of the Quality Assurance Division of NSK shall sign them to indicate approval after checking the details and return one copy to the supplier. For the submitted Production Process Control Lists, NSK shall handle them with care.

6. Re-submission due to Alteration

When there is an alteration in the Production Process Control Lists, re-submit new Production Process Control Lists immediately. For handling alterations in processes, refer to Procedure IV, "Process Alteration Procedure".

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NSK Ltd.

To:.....

PRODUCTION PROCESS CONTROL LIST

Applicable standard			
Type of steel Shape Dimensions			
Issue No.			
Date			
Name of Company			NSK Confirmation
Issuers			

Alteration No.	Date	Content	Issuer	NSK Confirmation

PRODUCTION PROCESS CONTROL LIST

Process	Machine or Equipment	Control and Inspection Items	Control Standards (Including operating conditions, lot assurance system, and criterion.)	Remarks

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MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL

Procedure IV Process Change Procedure

1. Scope

This quality assurance manual specifies the procedure which NSK suppliers should follow in order to change production processes.

2. Purpose

The purpose is to prevent deterioration of quality from occurring when changing processes, operating conditions, etc. in the production and inspection processes in order to simplify production reduce costs, or improve quality.

3. Types of Process Change Requiring Approval

The types of process changes that require application to NSK for approval are shown below.

Change Requiring Approval

- (1) Major changes of material (such as change in material manufacturer on raw material procurement).
- (2) Changes in processes such as melting, casting, forging, rolling, heat treatment, etc.
- (3) Changes in production place or subcontractor.
- (4) Major changes in equipment, control items, control standards, etc. as specified on the Production Process Control List.

4. Process Change Procedure

In order to change a process, the supplier shall submit the Process Change Application shown on Form 4 to the Quality Assurance Division of NSK at least 45 days before the changes.

5. Enforcement of Process Change

NSK shall approve or reject the process change with the Process Change Reply shown at the bottom of Form 4. The supplier will make the change if approved after their receipt of the Process Change Reply.

6. Supply of Material after Process Change

When supplying material after process change, the supplier shall use special controls such as recording the production conditions and inspection results within the process and perform initial product control in accordance with procedure V, “Initial Product Control Procedure”.

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APPLICATION FOR PROCESS CHANGE APPROVAL

NSK Ltd.

To:

We hereby apply for your approval since we would like to change the process as follows:

Issue No.	
Issuing date	
Name of company	
Office	
Issuers	

Type of material and shape:	Size:	Reason for Change:
Description of Change:		
Old process	New process	Quality characteristics which will be affected:
Process alteration schedule Month day	Supply schedule for material with process change Month day	Attached data

Process Change Reply

To:

With reference to the above process change Application, we reply as follows:

No.	
Issuance date	
NSK Office	Receipt

Approval or rejection of change:	Approved · Rejected
Conditions for Change:	

Recipients

NSK Q 002 Form 4

MATERIALS SUPPLIER QUALITY ASSURANCE MANUAL

Procedure V Initial Product Control Procedure

1. Scope

This quality assurance manual specifies the procedure which NSK suppliers should use in order to specially control initial products.

2. Purpose

The purpose is to make quality assurance more certain by specially controlling initial products.

3. Definition of Initial Products

“Initial products” means materials that are produced during a specified period of time after production starts or changes and generally includes the following items:

(1) Newly developed material and trial manufactured material:

Material which is produced in accordance with a trial manufacturing specification, etc.

(2) Material from new supplier:

Material which has been produced by a new supplier.

(3) Material following process change:

Material produced after a production process change approved by the Process Change Procedure.

(4) Material following countermeasure:

Material for which a countermeasure has been taken to correct defective material.

4. Control of Initial Products

The “control of initial products” means special controls to secure the desired quality, stabilize production early, and eliminate factors that increase cost. The control period for initial products is shown below.

Type of material	Examples	Initial product Control period
Critical materials	<ul style="list-style-type: none"> ● Material for safety related products ● Material for specifically designated products 	For more than three months after initial production; however, for each delivery if the number is small.
Standard materials	-	For more than one month after initial production

The control of initial products shall be performed for the above period from the start of production of newly developed material, trial manufactured material, material from new supplier, and material following countermeasure, or after receipt of the Process Change Reply.

5. Initial Product Supply Procedure

When supplying initial products, the actual products, invoice and Inspection Report shall indicate that they are initial products (newly developed material, trial manufactured material, material from new supplier, or material following countermeasure).

MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL

Procedure VI Disposition When Defects Occur

1. Scope

This quality assurance manual specifies how NSK's suppliers should respond when defective materials for NSK are discovered.

2. Purpose

The purpose is to prevent defective products from being supplied to customers and to prevent recurrences.

3. Report and Disposition When Abnormality Occurs

When a supplier detects an abnormality in production and the defective lot has already been supplied to NSK, or when there is such a possibility, the supplier's person in charge of quality assurance shall notify NSK orally or by telephone immediately. Then, he shall enter the following information in the Abnormality Occurrence Report shown in Form 5 and send it to the Quality Assurance Division of NSK and the Quality Assurance Division in the plant concerned immediately and then receive instructions for disposition from them. Also, when he is notified of an abnormality occurrence through the Defective Material Notice shown in Form 6, he shall follow the instructions for disposition in the same manner. When the trouble is indicated to be a critical material quality problem in the Defective Material Notice, NSK may issue the Critical Material Quality Problem Notice shown in Form 7 and at the same time, enter the procedure for countermeasures to prevent a recurrence.

(1) Circumstances surrounding defect and presumed cause

(2) Date of supply, supplied quantity, type of material, shape, dimensions, melt No. and Production No.

(3) Supplier's tentative disposition and final disposition of the supplied material.

4. Report on Countermeasures for Defect

The supplier shall prepare a report concerning the cause of the abnormality and

countermeasures within 10 days (if, however, another time limit is specified by NSK, the specified date) after the abnormality occurs and receive approval from the Quality Assurance Division of NSK.

5. Supply of Material after Countermeasures

Before supplying material after taking countermeasures, follow Procedure V, “Initial Product Control Procedure”.

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NSK Ltd.

To Chief, Quality Assurance Division
 To Chief Plant Quality Assurance Dep't

Issue No.			
Issuing date			
Name of company			
Office			
Issuers			

Abnormality Occurrence Report

We report here that the following abnormality occurred,
 we will report later on the cause of the abnormality and
 countermeasures for it.

Occurrence date:				Occurrence process:				
Description and presumed cause								(Sketch)
Tentative disposition of material:								
Extent of affected material:								
Date of shipment	NSK Plant	Type of material	Shape	Dimensions	Heat treatment	Finish	Melt No.	Quantity weight

* NSK Receipt	Quality Assurance Division		

NSK Q 002 Form 5

DEFECTIVE MATERIAL NOTICE

1. Occurrence Report

2. Final Report

Date:

No.

Quality Assurance Dep't

Plant

NSK Ltd.

To:

Issuer			
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(1) Since the following material defect was found in our acceptance inspection of your material,

(2) Since we used your material and defects resulting from the material occurred,

We inform you and request you to explain its occurrence and countermeasures.

Answer by: letter · phone · visit · other

Occurrence day	Date	Bearing Nominal No.	Inner rings · outer rings · Rollers · Balls · Cages				
Occurrence process	Inside company/Outside company						
Description of Defect	Type of Defect (Sketch)						
	Material weight kg						
Affected material	Type of steel	Shape	Heat treatment	Finish	Ⓐ Ⓢ Ⓓ Ⓟ Ⓡ Ⓐ Ⓚ Ⓤ Ⓚ ⓐ Ⓟ ⓐ Ⓟ ⓐ		
	Size	Shipment date					
	Melt No.	Shipment Quantity		Usage		Qty. in stock	
		P'cs (coil)	kg	P'cs (coil)	kg	P'cs (coil)	kg
Disposition							

Recipients: 1 Plant Sales Div. 2 Plant Production Div. 3 Sales Div.

4 Quality Assurance Div.

5

NSK Q 002 Form 6

To:

Date		
NSK Ltd. Quality Assurance Division		

CRITICAL-MATERIAL QUALITY PROBLEM NOTICE

We inform you here that the following defect has been designated to be a Critical Quality Problem. Please plan to prevent any recurrence and submit a “Defect Preventive Countermeasure Sheet” before (month) (day).

Material Defective Notice No.			Date of occurrence		
			Affected plant		
Type of Defect					
Type of Steel		Size		Shape	
Description of Defect					

Recipients	
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NSK Q 002 Form 7

MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL

Procedure VII Subcontractor Utilization Report

1. Scope

This quality assurance manual specifies the method of reporting that NSK's suppliers should follow to utilize subcontractors for outside services (hereinafter called subcontractors) for materials to be supplied to NSK.

2. Purpose

When a supplier entrusts a portion of the processing to a subcontractor, the supplier shall report it to NSK beforehand, and NSK shall advise the supplier on the utilization of the subcontractor, if necessary, in order to help the supplier with its quality assurance system.

3. Reporting Procedure

When a supplier is requested by NSK in the Purchasing Specifications, etc. to submit a Subcontractor Utilization Report, the supplier shall enter the necessary data in the Subcontractor Utilization Report shown in Form 8 and submit it to the Quality Assurance Division of NSK.

4. Re-submission due to Alteration

For alteration of a subcontractor, the supplier shall follow Procedure IV, "Process Alteration Procedure", and if the subcontractor Utilization Report has been submitted, re-submit it.

MATERIAL SUPPLIER QUALITY ASSURANCE MANUAL
Procedure VIII Quality Control Status Report for Critical Control Processes

1. Scope

This quality assurance manual specifies the procedure which the supplier should follow in order to submit the Quality Control Status Report for Critical Control Processes to NSK.

2. Purpose

Each supplier shall report to NSK on the equipment, test instruments, operators, inspectors, etc. in production processes such as forging and heat treatment that are controlled by the supplier, in which the internal quality of materials should be assured, and in specific inspection processes (hereinafter called Critical Control Processes) which confirms the effectiveness of magnetic particle inspection, ultrasonic inspection, eddy current inspection, etc. NSK shall advise the supplier concerning the control of the critical control processes, if necessary, in order to help the supplier with its quality assurance system.

3. Reporting Procedure

When a supplier is requested by NSK in the Purchasing Specifications, etc. to submit a Quality Control Status Report for “Special Process”, the supplier shall enter the necessary data in the Quality Control Status Report for Critical Control Processes as shown in Form 9 and submit it to the Quality Assurance Division of NSK.

4. Re-submission due to Alteration

For alterations in the control of critical control processes, the supplier shall follow Procedure IV, “Process Alteration Procedure”, and re-submit the Quality Control Status Report for Critical Control Processed.

Remarks: A “Special Process” is one of the “Critical Control Processes” and it is necessary to place emphasis on this as a critical process and to perform the special control. In addition to the special process, the “Process Condition Control Process” such as acid pickling and coating, in which it is difficult to detect a defect by inspection requires also the special control for the same reason.

NSK Ltd.

**QUALITY CONTROL STATUS REPORT
FOR CRITICAL CONTROL PROCESS**

To: Chief, Quality
Assurance Division

Issue No.	
Issuing date	
Name of company	
Office	
Issuers	

Type of Material, Shape:	Size:	NSK Purchasing Specification No.	* NSK Confirmation		
Name of Process	Names of equipment, or names of operators, inspectors	Applicable Standards	Validity	Acceptance certificate No., Qualification Division, agent, etc.	Remarks

Spaces marked*: to be filled in by NSK

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