

Quality Assurance Manual

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Goal

This quality Manual is a working tool. This is the document describing the general dispositions taken by TNT, in order to obtain, assure and manage the quality of its products and services. Furthermore, this manual as well as the associated directives are a reference for the general organization of company.

This Quality Manual relies on the Quality Policy of the management of TNT.

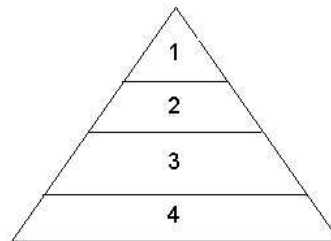
Scope

This quality manual is applicable to the staff, the products and the activities of the company.

Description

In accordance with the standards applied, the structure of the documentation described in this manual is as follows :

1. Quality Assurance Manual (this document)
2. General directives
3. Associated forms
4. 4. Work instructions and registrations



Version date, entered on 25 August 2000. The Quality Manual is treated as a Quality document. The associated directive is QD-01-003 - Maîtrise des documents (Documents control)

The valid revision is the one of the last revision revised and signed by the management filed in the binder of the original files. The last revision will be corrected on the website within 15 days after signature of the original or modification order form.

Normative basis

This quality manual is based on the standard EN ISO 9001:2000

Quality Policy

The TNT quality policy defines the company's view of the total quality as:

"achieving complete customer satisfaction through involvement of each and every person in meeting the specific customers requirements".

This policy is based on process oriented ISO 9001 Quality System.

The main themes covered by the quality policy are:

Documentation of the know how; each level of the company to be involved in building up a know how.

Training & qualification; each employee to be fully trained to achieve total qualification for their respective function.

Delivery time; the shortest possible delivery time in order to be competitive and efficient.

Customer made service; adequate tests and controls equipment to ensure total satisfaction of each clients' needs.

Continuous improvements; constant questioning research & development to achieve the best effectiveness.

Pascal Rochat
Director

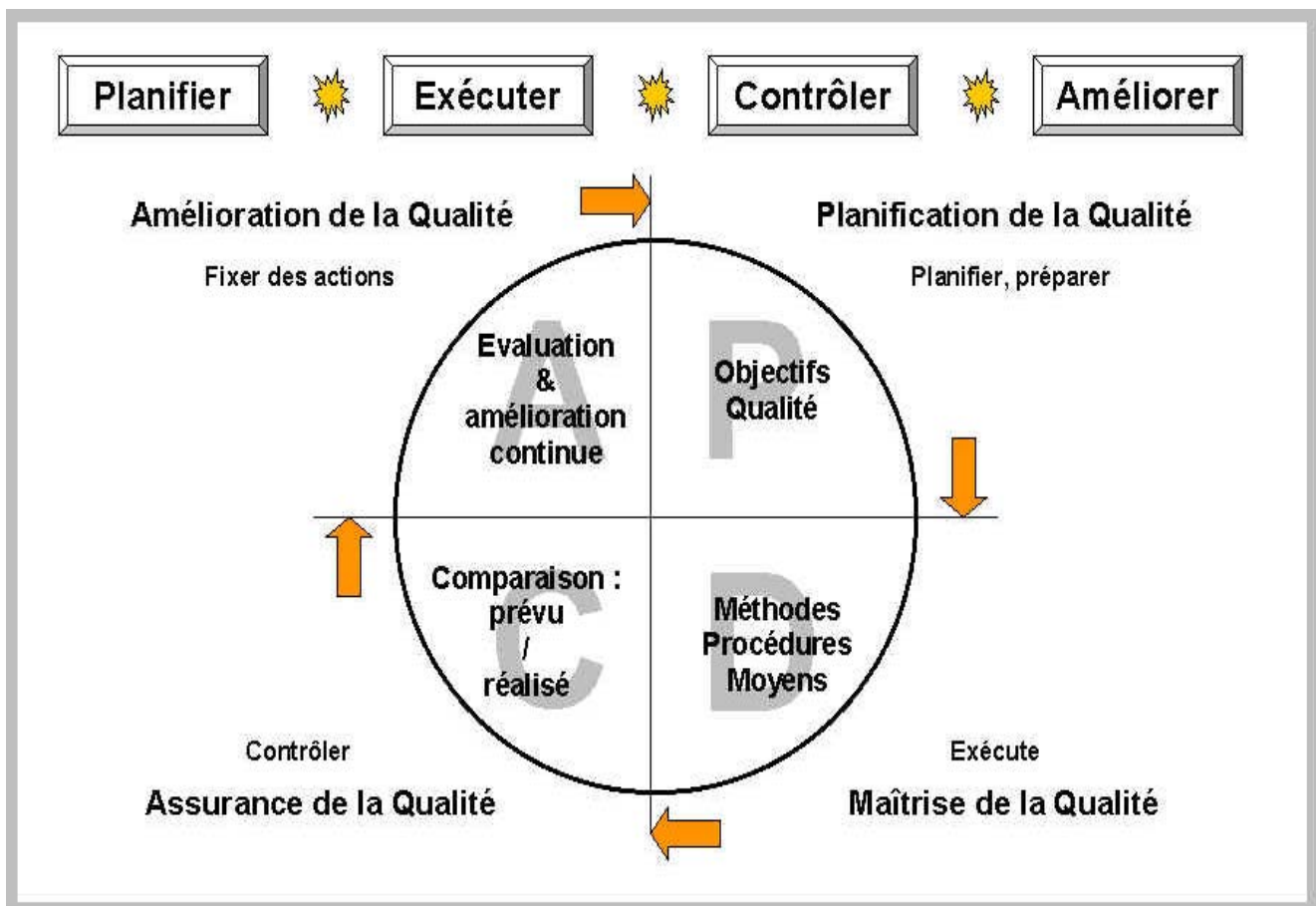
Deming Wheel

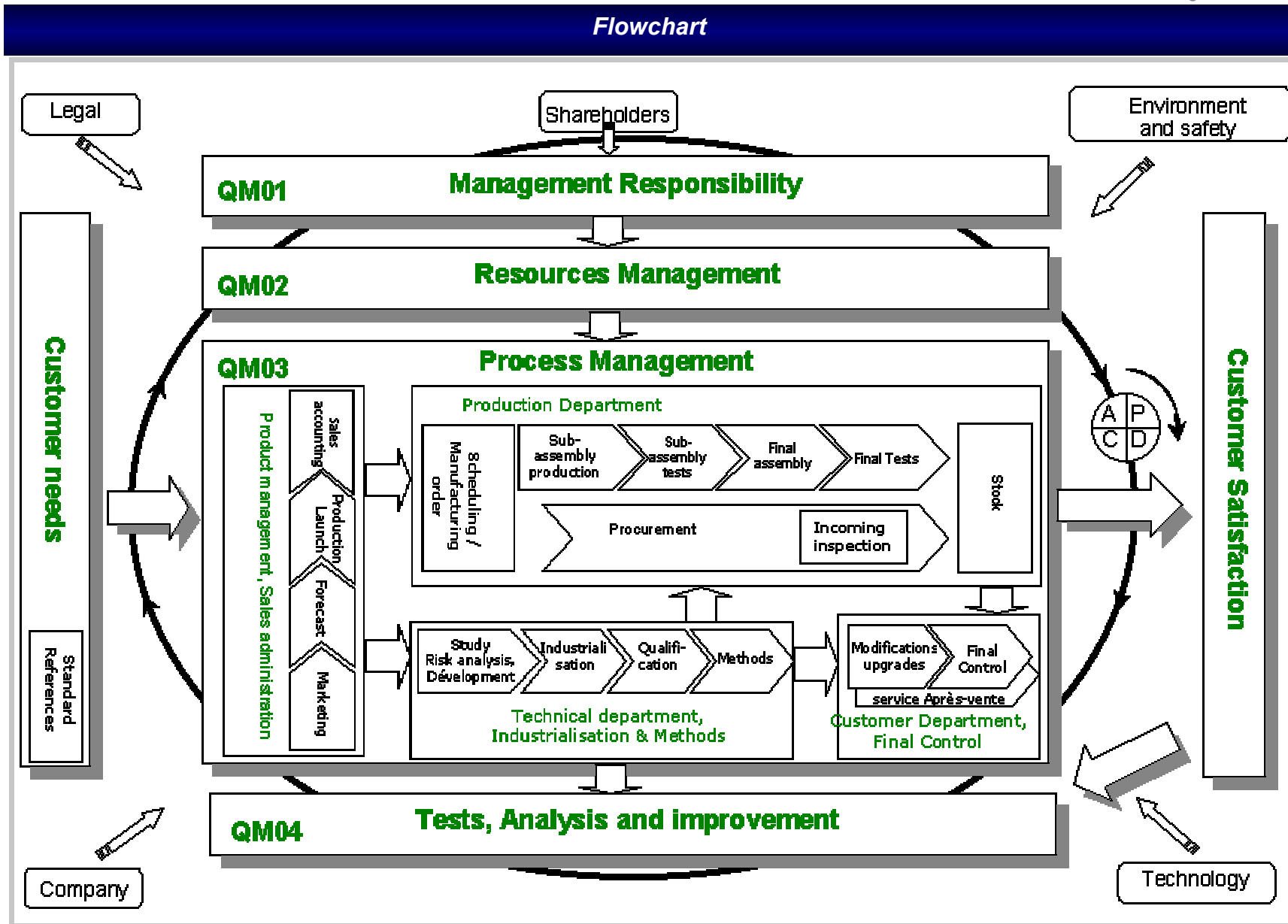
In TNT's view, the predominant element of the ISO 9001:2000 standard is the continuous improvement. Therefore, the continuous improvement will mainly be implemented in the following domains by the application of the Deming wheel :

- for the processes : corrective and preventive actions recommended by the scheduled internal audits will be applied

- for the quality system : the measures recommended by the external/internal audits will be applied and the objectives defined annually at the management review will be achieved

The continuous improvement in both the above mentioned areas will push us to improve the customers satisfaction. It is regularly quantified by direct contacts.





Management Responsibilities

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Description of the Management Responsibility.

The mission of the management is to cover all the tasks related to its responsibilities. These responsibilities are mainly:

- To define the strategy by scheduling the company activities and the related budget
- To evaluate the competitors and define the company position on the market
- To evaluate the customer needs and requests
- To define the quality policy
- To define the general company organization including hierarchy structure
- To define the quality organization
- To assure the continuous improvement of the company (using audit system, records and statistics, non-conformance control system, ...)
- To manage the information
- To take into account the legal, safety and environmental aspects
- To ensure the personnel certification and training

These points are reviewed at least once a year during the Management review.

General Management Tasks

The General Management Tasks are available through the function description of the President and the Vice-President.

Quality Management

The Quality Management tasks are given by the function description of the Quality Manager and the Vice-President who is the quality delegate to the directorate.

Resources Management

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Objectives of the Production Department

Main Responsibilities of the Resources Management

The management of the resources takes into account that the quality system concerns all the company employees. The main responsibilities are:

- To manage the finances
- To manage the employees in terms of administration and hiring (salaries, holidays, absence, motivation, training, communication...)
- To ensure the maintenance and the availability of adequate working places (including equipments and support)
- To ensure the safety within the company
- To respect health of the employees by providing adequate working conditions
- To ensure a respectful and ethics management towards the employees and their environment

The directives associated to the resources management are:

- Formation du personnel QD-02-001
- Engagement du personnel QD-02-002
- Gestion du personnel QD-02-003
- Sécurité et aménagement des places de travail according to the Msst binder and job description of the "security" responsible.

Other related forms :

- Request for days off
- Request for extra hours
- Directives for external missions
- External mission list
- Employees list

Staff Employment

The employee hiring procedure is based on the suitability between the function to be filled or to be created and the CV / certificates of the applicant. After a first selection, based on the applications received, the remaining candidates are interviewed by the management and the manager of the open position. Once the final decision is taken, the Management Resources Manager formalizes the hiring by a contract according to the Swiss laws.

Regarding the hiring of personnel for the space activities, the manager identifies the personnel need with the specified qualification required. If none of the TNT personnel correspond to the required qualification, the process is sub-contracted to a specialized company.

Staff Management

The administrative tasks as well as the working hours are supervised by the human resources manager. The day to day information to the staff is made by the Departments Managers in accordance with the management. A weekly meeting takes place with all the department managers and the management. Should a special communication be made to all the employees, the management will invite them to a general information meeting (usually after the morning break). Out of the discussions with their manager, every employee may discuss directly with the management anytime. Furthermore, they may express themselves to the management by using the form for the annual survey :

- Satisfaction du personnel (QF 02 002)

Personnel certification and training

Each and every employee at TNT is trained or certified in order to perform his/her function effectively and correctly. All accepted training, internal or external, are recognized by either:

- an attestation
- a certificate
- a diploma
- etc...

They are filed in the employee's record. Following the identification of the training needs, a plan is set up and given to the management for acceptance. The following related forms apply:

- Besoin en formation (QD 02 001)
- Fiche individuelle de formation (QF 02 001)

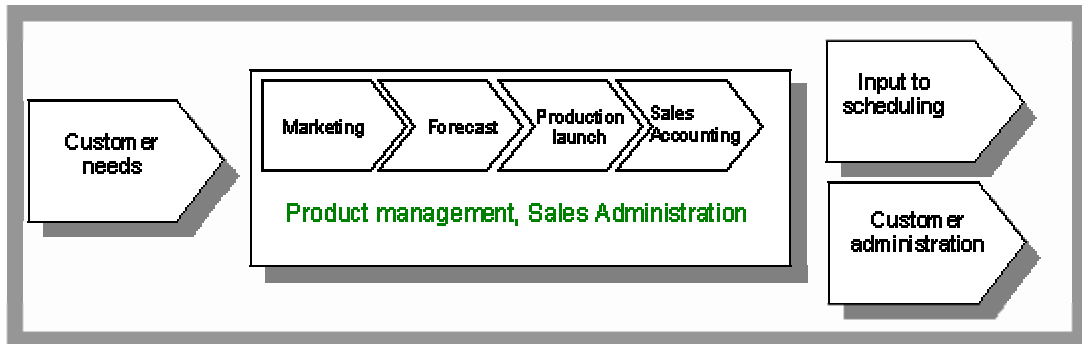
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Description of the Product Management and Sales Administration tasks

The flux below describes the process chain and the general tasks related to the product management and sales administration. Directives and forms support the description. These directives and forms are listed in the quality documentation list. This list includes all the quality documents.



Marketing

The marketing activities provide all the necessary information in order to forecast and launch the production. A good marketing action is one of the priorities of the management to ensure the future of the company. The associated directive is:

- Marketing (QD 01 004)

Forecast and Production launch

According to marketing activities results, the management evaluates the market needs with an anticipation of 6 months. Based on this evaluation, a forecast is performed and a new batch of production is launched. The associated directive is:

- Prévisions et lancement (QD 03 010)

Sales Accounting

The other results of marketing activities is the reception of the customer orders. Follow-up and associated administration tasks are performed according to the directive below:

- Suivi des commandes client (QD 03 009)

Production Department Flow

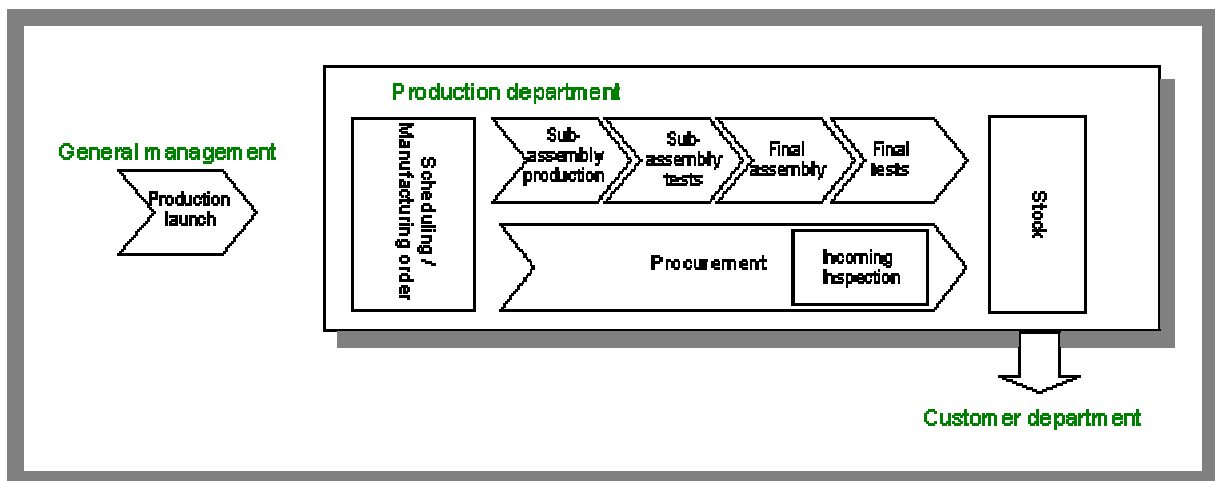
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Objectives of the Production Department

The production department is in charge of the procurement and the assembly of all the elements related to the production of the TNT products. The production department is responsible for the operations realized within the department in terms of quality, delay and cost.

Description of the Production Department Flow

The flow below describes the process chain from the production launch request up to the delivery of the product to the stock. A set of directives describes how the process must be realized as well as the procedures, the tools and forms to be used. These directives and forms are listed in the quality documentation list.



Scheduling / Manufacturing order

According to the production launch decisions, the production department starts the process related to the "scheduling / manufacturing order". This process is followed by the material procurement and then the manufacturing starts. The computer tools used for the "scheduling / manufacturing order" are based on the GPAO system.

Procurement

According to the "scheduling / manufacturing order" decisions, the production department starts the procurement process of all the useful components for the assembly of the requested number of products. The orders are preceded by the selection and qualification of the suppliers and sub-contractor process. Regularly an evaluation process is carried out. A specific subset of directives defines the procurement operations.

- Commandes aux fournisseurs (QD 03 002)
- Evaluation des fournisseurs QD04 004
- Contrôle réception (QD 03 003)

These directives are also applicable for the other kinds of procurement.

Sub-Assembly Production and tests

According to the "scheduling / manufacturing order" decisions, the production department starts the sub-assembly production. This production concerns all the mechanical, optical and electrical sub-systems. The associated directive is:

- Assemblage / Fabrication (QD 03 007)

Sub-Assembly Test

At the end of a sub-system assembly process, the sub-assembly test is performed. The sub-assembly test concerns all the critical mechanical, optical and electrical sub-systems. The list of the tests to be performed is part of the Industrial Files dedicated to each product.

Final Assembly Production and Final test

After the successful test of the sub-assembly parts, the production department starts the process related to the final assembly production. At the end of this process, the complete standard product is realised. Each product receives a numbering according to the directive QD 01 001/ 3.2

Final Test

At the end of the final assembly, the final test is performed. The final test is dedicated to each product and is based on a test list included in the Industrial Files. The associated directives are:

- Assemblage / Fabrication (QD 03 007)
- Contrôle final (QD 03 005)
- Gestion des non conformités (QD 04 002)

Stock

The purchased material and components are kept in a controlled stock and in appropriate conditions preventing their deterioration. The associated directive is:

- Gestion du stock (QD 03 015)

All products or sub-assemblies which could influence the quality of the final product are subject to an incoming inspection or entry test :

- Contrôle réception / stock (QD 03 003)

Technical Department Flow

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Objectives of the Technical Department

The technical department is in charge of the development and qualification of TNT products and test facilities. The technical department is also in charge of the product industrialization and the associated methods. The technical department is responsible for the operations realized within the department in terms of quality, delays and costs.

Description of the Technical Department Flow

The flow diagram related to the technical department illustrates the applied process. A dedicated set of directives describes the procedures, the tools and forms to be used. These directives and forms are listed in the quality documentation list.

Study, Risk analysis, Development

According to new customer requirements or needs, the general management may decide to initiate a study for a new development. A study could also be initiated for test or production facilities by the general management. At an early stage, a risk analysis is performed to assure a reasonable ratio between development cost, feasibility and investment return. The associated directives are:

- Développement / Industrialisation et Methodes (QD 03 008)
- Prévision et lancement (QD 03 010)

Industrialization

Not only at the end of a development process but also during the prototype elaboration, the industrialization process must be applied. The final quality and the cost of the product are strongly dependent on the industrialization process. The associated directive is:

- Développement / Industrialisation et Methodes (QD 03 008)

Qualification

Before the release of a product on the market, qualification tests are applied. The level of the qualification is given by the performances defined during the study according to the market needs. Specific qualification could also be requested by customers. In this case, the TNT policy will depend on the quantity of pieces to be supplied and a new campaign of qualification may be realized. Thereafter, the customer will receive a report of the specific tests The associated directive is:

- Qualification (QD 03 012)

Methods

The assembling and the tests of all the products are covered by associated methods. The methods engineer writes all the necessary procedures and process documentation to manufacture and test the products. The associated directives are:

- Développement / Industrialisation et Méthodes (QD 03 008)
- Modification du produit (QD 03 016)

Customer Department and Final control flow

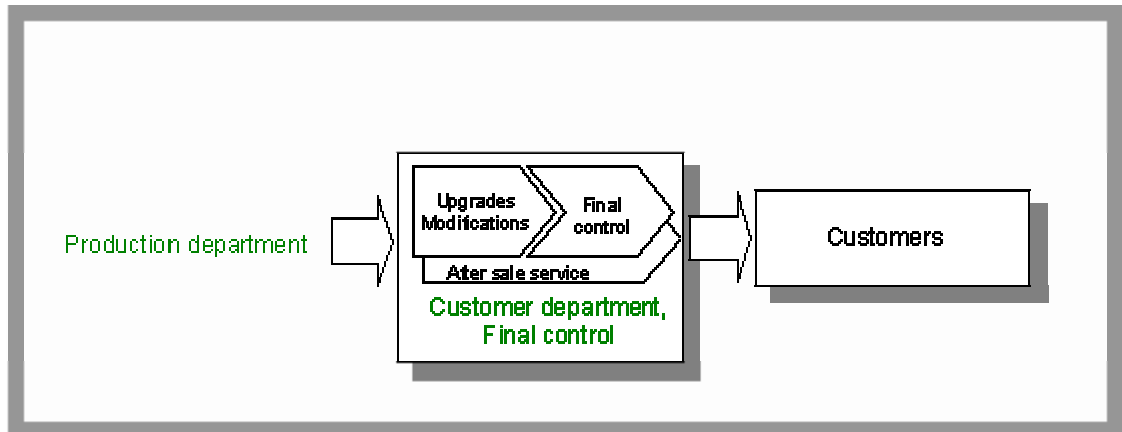
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Objectives of the Customer Department

The customer department is in charge of the customization, the conformity test, the preparation of deliveries and the after sale service of the TNT products. The customer department is responsible for their operations in terms of quality, delays and costs.

Description of the Customer Department Flow

The flow diagram related to the customer department illustrates the applied process. A dedicated set of directives describes the procedures, the tools and forms to be used. These directives and forms are listed in the quality documentation list.



Upgrades / Modifications (Customization)

TNT offers several options for each product. Furthermore, upon agreement with the customer, customization can be implemented. The customer department implements the options on the standard units at the end of the long term test. The test of the options as well as the optimization of the internal parameters are part of this process. The associated directive is:

- Mise en conformité /Gestion des options (QD 03 014)
- Modification du produit (QD 03 016)

Final Control

Prior to the delivery, a final control is performed on each piece. The final control is based on the standard final control sheet. Upon request a specific final control sheet may be applied. The associated directive is:

- Contrôle final (QD03 005)

After Sale Service

All customer complaints are treated by the customer department. In case of failure of a TNT product, the TNT after sale service will repair or replace the failed unit. The customer shall contact TNT and request an RMA (Return Material Authorization) reference number. Upon reception of the RMA number, the customer can send back the concerned unit.

Once the part is received, TNT takes care of the customer's proprietary. For the correct follow up and in order to avoid the loss or damage of the product, the parts are clearly identified, verified and protected in appropriate conditions. Should the damaged part be replaced, the customer will be informed through the repair report. On request, he may also receive the "Failure Analysis and Corrective Action" form.

The related after sales service directive and document are :

- Service Après Vente (SAV) (QD 03 013)
- Failure Analysis & Corrective Action (QF 04 011)

Control, Analysis and Improvement

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Objectives

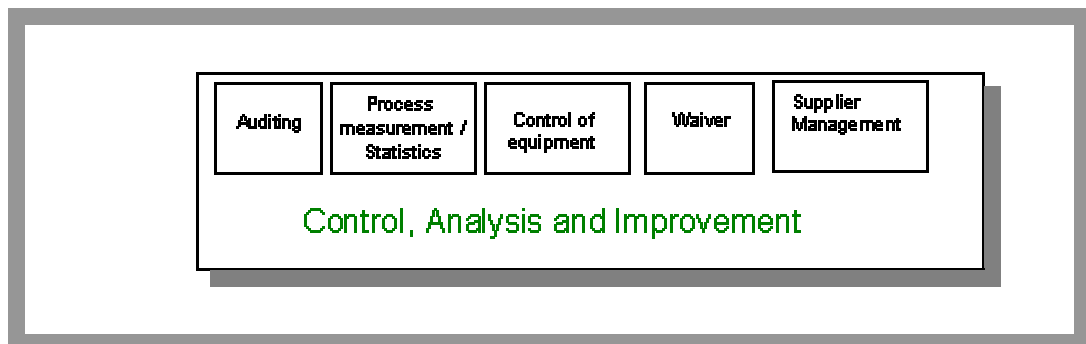
Satisfy customer through appropriate quality and constant improvement of TNT products. This is insured via:

- Measure and control of all parameters determining for each unit
- Organization and application of internal / external audits
- Control inspection of measurement and test equipment
- Tracking of purchasing activities
- Follow-up of non-conformities
- Records, analysis and process measurements

All related quality records are regularly reviewed during the Management Review. They are used as a support to the corrective and preventive action plan. The TNT Management is responsible for insuring that all employees actively participate to the quality program through their personal involvement.

Description

In order to fulfill the quality objectives, a number of different tools and activities are applied in the manufacturing process. The Quality Manager's work is based on the Quality Manual implemented and updated in accordance to the customer requests and the company evolution.



Auditing

An audit system is implemented within the TNT company. The audit system covers in-house and external audits. As required, sample mini-audits targeted or random can be implemented. The main goals of the audits are:

- To assess the capability of the audited organization in order to perform the required tasks of design, manufacturing and tests.
- To assess the adequacy of the facilities used by the audited organization
- To verify the adequacy of the PA plan implemented by the audited organization (external only)

The audits results are analyzed and discussed with the management. Corrective actions are suggested in view of continuous improvement and optimum efficiency. .

On request, TNT customers can assist the audits and will receive the audit report copy (except for the confidential data). The related directives are:

- Audit (QD 04 003)
- Plan d'audit (QF 04 008)
- Rapport d'audit (QF 04 005)

Records / Statistics

Each department save specific datas illustrating their activities. The data are selected, saved and published on a regular basis in the "Process measurement" - Statistics site. This is the basic of the "numbering" quality goals. These data are available at any time (although some of them are confidential) and they are presented at the management revue. Quality records are stored in a safe way to prevent alteration. The associated forms are:

- Gestion et Sauvegarde des PC (QD 01 002)

Control of Equipment

All control, measure and test equipment used during the verification activities is controlled, maintained and calibrated on a regular basis. The control and calibration are performed according to the following directive and forms:

- Maîtrise des équipements de contrôle (QD 04 001)
- Fiche individuelle d'appareil de contrôle (QF 04 009)

Non-Conformities Control System

Non-conformities control system is implemented. A monthly review is performed to assure that the non-conformities detected are analysed and that the corrective and preventive actions are taken. The applicable directives and forms are the following:

- Gestion des non-conformes (QD 04 002)
- Notification de non-conformité (QF 04 001)

Waiver

TNT submits a Request for Waiver (RFW) to the customer for approval when the corrective actions of an NCR are not sufficient in order to avoid a discrepancy with customer requirements. The RFW form is the following:

- Request for Waiver (QF 04 002)

Supplier Management

In order to meet specified requirements on the purchased products, TNT provides selection of the suppliers and subcontractors. The evaluation is described in the following directive:

- Evaluation des fournisseurs (QD 04 004)

Space Activities

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Space projects Objectives

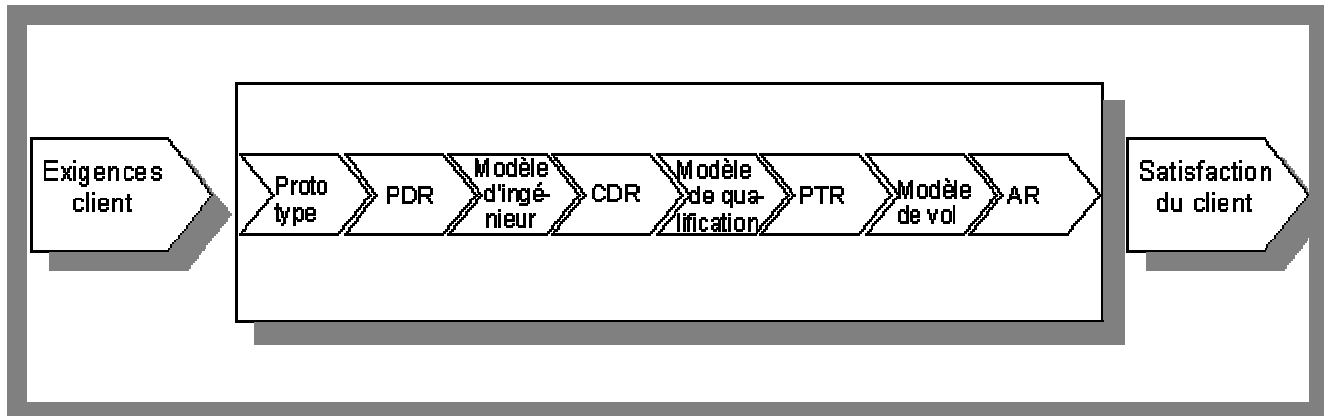
TNT designs products for the space market, on internal or external requests.

Description

These mandates are managed as independent projects from the usual industrial activities. The development flow, qualifications and production are set on a case by case basis by the customer. The SOW (statement of work) provided by the customer at the beginning of the project will define the required flow. The customer will also provide a "PA plan " (product insurance plan) describing the quality system to be applied during the whole project time.

For each project, TNT describes, in its own PA Plan, who will indicate the way the customer directives will be implemented. The directives and forms developed for the ISO 9001 quality system will be followed without modifications as often as possible. Any complementary information will be introduced and explained in the PA plan, only if the ISO9001 directives from TNT cannot be applicable.

The development flow usually applied to the space activities is as follows :



PDR : Preliminary Design Review
CDR : Critical Design Review
PTR : Post-Test Review
AR : Acceptance Review

The "space" department manages his own marketing and forecasts. It also uses his own resources Industrialization / methods, production (operations) and product engineers. These resources refer to the same quality general directives.

Space Activities

New products development is centralized in the TNT technical department as well as purchases, management, personnel management, administration and quality.

Usually, only adaptation of the "space" products are made by the "space" department, except for specific projects.