



QUALITY ASSURANCE MANUAL



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01. Introduction

OSSA was founded in Spain in 1952 and now operates worldwide. It is the leading specialist company in the underground construction sector, focussing on three business areas: construction, energy and mining.

Construction



Roads

Railways

Highways

Subways

Mining



Vertical Shafts
and Galleries

Special Works,
Excavations and
Chambers

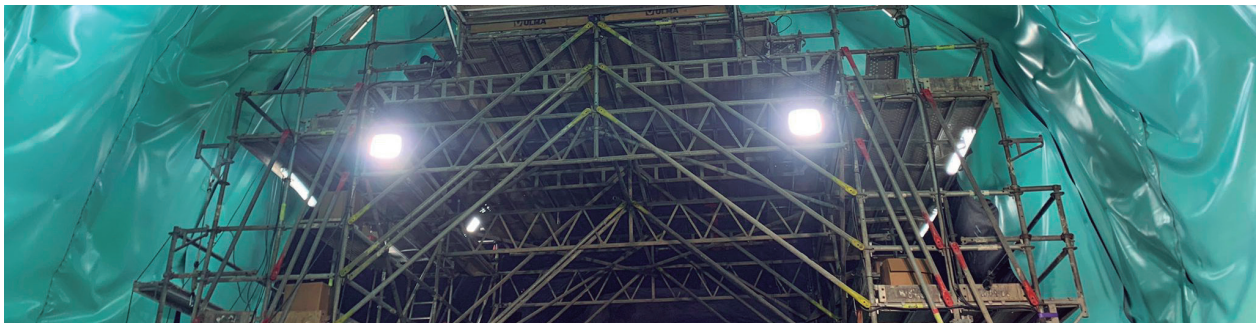
Energy



Pipelines, Diversions and Restorations

Large Caverns

Services



Installations

Electricity

Ventilation

Waterproofing

Technical Assistance

Tunnel Conditioning and Upgrading

OSSA is involved in underground excavation projects using the drill & blast technique (NATM), as well as in TBM excavation, micro-excavation, pipe jacking and other mechanical excavation methods.

Globally, OSSA has developed projects in Portugal, Greece, Norway, Peru, Colombia, Brazil, Panama, Costa Rica, Nicaragua, Guatemala, Chile, Hong Kong and Taiwan.

After more than 65 years of successes, our strategy consists in continuing the international expansion and providing services to large civil engineering and mining clients at all levels, contributing our broad technical experience and fleet of equipment and prioritizing the environment, quality, safety and innovation in all our projects.

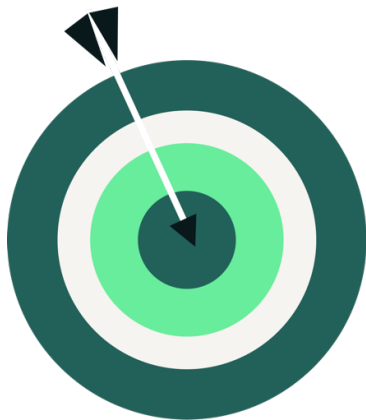
Philosophy

Quality, respect for the environment and Health and Safety in working environments are crucial elements for the development of our activities and the future of the Organization, wherever we may be.

Achieved goals

OSSA is firmly committed to Quality (ISO 9001), Health and Safety (ISO 45001), and the Environment (ISO 14001), and invests in Research and Development Projects UNE 166002) at the international level. OSSA has signed the United Nations World Pact, providing support and promoting a culture of responsibility in corporate governance.

OSSA has implemented at its sites an Management System as international standard, certified by BUREAU VERITAS. The system is implemented in all our sites and it is controlled and maintained by the managers of the different departments.



CERTIFIED
ISO 14001



CERTIFIED
ISO 45001



CERTIFIED
ISO 9001



CERTIFIED
ISO 56001



Commitments

THE OSSA QUALITY DECALOGUE

01. To increase the level of satisfaction and loyalty (consolidation) of our clients by providing works with a quality/price ratio adapted to their requirements and expectations.
02. To develop and maintain a group effort to increase OSSA's competitiveness by means of quality and productivity improvements enabling enhanced stability in the market and in technological progress.
03. To identify the Client's needs and requirements, both explicit and implicit (within legal requirements) to ensure compliance.
04. To involve and motivate our staff by encouraging their participation in the management, development and implementation of the SIG system in order to achieve the quality levels required by the Client.
05. To establish permanent training programs in order to develop highly qualified teams to reach if possible greater levels of security on site and carry out the activities comprised in the SIG system.
06. To promote collaboration relationships with our Clients, suppliers and subcontractors, enhancing participation in the commitment towards Quality and in the improvement of the quality of their work.
07. Analyze the efficacy of SIG for ongoing improvements year after year as well as to establish objectives based on obtained results.
08. To achieve said objectives, the management will establish within the General Policy of OSSA the necessary plans and resources to reach the established goals.
09. To this end, the Quality Department Manager is in charge of implementing and verifying compliance with SIG, to which end said manager has the necessary authority and independence within the OSSA organization.
10. Compliance with SIG is the responsibility of the entire Organization particularly of the staff in charge of carrying out the activities comprised within said system.



02. Quality policy

OSSA is a construction company established in 1952, specialized in underground civil engineering works, mining and the energy sector.

In alignment with its vision to “be the world leader in underground works”, and its mission to “carry out its daily responsibilities and operational duties to benefit shareholders in the framework of compliance with the law and best practices related to the environment, safety and respect for human rights”, the management of OSSA establishes this company policy as a framework for its daily activities and undertakes to:

- Care for the individuals who work for OSSA, promoting their professional and personal development in a healthy and safe working environment focused on preserving good health.

“The employees who work for OSSA make up the Company. So, better employees make OSSA a better company”.

- Invest in innovation, ongoing improvement in processes and management systems of OSSA as a means to ensure Client satisfaction and adding value to the technological developments of the industry.

“Client satisfaction together with research, development and innovation are the first steps to achieve and maintain the worldwide competitive leadership of OSSA ”.

- Ensure strict compliance of the requirements agreed with clients, whether specified or non specified but intrinsic to each one of the provided services, as well as compliance with legal requirements, human rights and other issues which OSSA voluntarily undertakes to fulfill.

“OSSA supports its services as a specialized contractor with commitment and transparency ”.

- Protect the environment, respect different cultures and help to prevent contamination, as well as ensuring the sustainable development of the countries in which OSSA operates. To achieve this, OSSA undertakes to work with its employees, their families, local communities and society in general to enhance their quality of life.

“OSSA’s viability is based on the viability of the business results in society and in the environment in which we operate”.

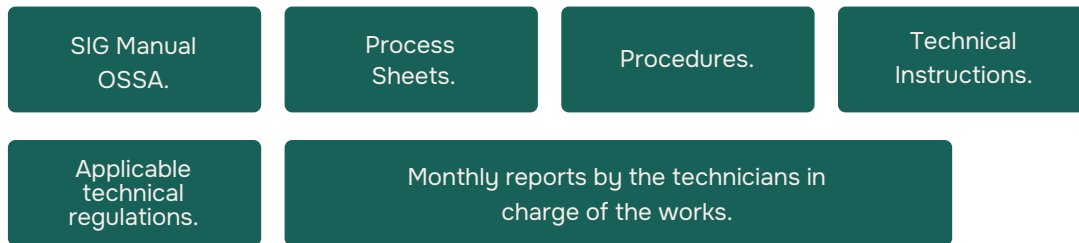
- Include R&D&I as a basic principle, establishing and developing a Management System in accordance with the UNE 166002 standard and establishing R&D&I objectives.

“At OSSA we believe R&D&I to be the engine of our growth”.

03. Management systems

Tools

Tools that make up our management system are:



04. On-site quality plan

The following elements must be taken into account for the development of the quality plan of our works:

- OSSA management system.
- Client Requirements.
- Applicable regulations.



On the basis of the requirements established in ISO 9001 and the criteria defined by the Client, OSSA develops a specific Quality Plan for the projects.

According to our procedures, a first draft will be drawn up at the beginning of the project, being a living document, which will have at least one review per year.

The tools will allow us to focus the development of the specific Quality Plan for the Works.

The Quality Plan must include at least the following elements:

- Structure and organization.
- Control documentation.
- Communications.
- Project analysis/change control.
- Identification and traceability.
- Inspection and tests.
- Process control.
- Procurement and subcontracts.
- Product preservation.
- Control of measurement equipment.
- Audits, non conformities, claims, correctives actions.
- Documentación final de obra.

Structure and organization

This section defines the duties and responsibilities of organization members.

Control documentation

This is the system for monitoring the preparation, review, approval, distribution, modification archiving and cancellation of all documents generated at the works.

Within SIG, the OSSA Quality Department prepares Technical Instruction IT01- Control documentation and record on site, which is the reference for defining the specific procedure for the works.

From the beginning of each one of the works, a work file is implemented using the Dropbox tool, this file will be used to manage all the documentation that will be generated in Work.

An initial folder with the name of the Work will be created in Dropbox. This folder in turn will be composed of the folder tree that will be:



The project manager and those responsible for Quality will propose the authorizations and/or persons responsible for accessing each of the folders. During the execution of the work, each block will be guarded by the person responsible for it. Once the work is completed, the digital work file will be permanently stored at the central offices.

Special mention must be made of the Drawings Documentation Control. The OSSA Quality Department has prepared within SIG the Technical Instruction IT02- Drawings Control that is used as a reference to define the specific procedure for the works.

A good documentation control system must have the following characteristics:

- The documents are ORGANIZED AND ACCESSIBLE the organization members.
- RECORDS are kept of the MODIFICATIONS and the VALID documentation can be identified at any time.
- There is CONTROL to determine who has received the documentation
- There is CONTROL and a RECORD of canceled documents.
- Adequate and legally required CUSTODY is available after completion.

A poor documentation control system entails :

- **NOT being able to find the documentation when needed.**
- **NOT** knowing which version is VALID.
- **NOT** knowing who is RESPONSIBLE for each document area.
- **NOT** filing CANCELED documentation.
- **NOT** keeping documentation which can be required by law.

Communications

A procedure must be established for:

- Ensuring INTERNAL COMMUNICATION between different levels and duties in the organization concerning issues related to system management.

This communication can be implemented by means of:

- Regular meetings of the managers in charge of system implementation for feedback and suggestions.
- Posters and billboards.
- Mailbox for feedback.
- Direct information, verbally or in writing.
- E-mail.
- These channels and any other enabling two-way communication.

- Defining a SYSTEM for receiving, documenting and replying relevant communications from third-party partners (Clients, public organizations, others).

Incoming and outgoing records will be kept of documentation which can be archived, together with appropriate schedules. In communications with official bodies, the original documentation must be archived.

A good communication system comprises:

- ORGANIZED incoming and outgoing communication and distribution.
- HISTORIC RECORDS of all communications with date and attachments.
- The ability to VERIFY whether adequate communication channels have been followed in order to overcome deficiencies.
- THE SYSTEM CAN BE IMPROVED by the members of the organization.
- INVOLVEMENT of organization members in the execution of the Works.

A poor communication system involves:

- **NOT** finding the communications exchanged with clients, official organizations or others.
- **NOT** COMPLYING with document requirements in a timely manner (legal or administrative).
- **NOT** INFORMING the members of the Organization about modifications which are relevant for their duties.

Project analysis/control of modifications

When contracting the works, the Project must be analysed to verify that the documentation and data are correct in order to:

- VERIFY if all necessary documentation is available and complete with sufficient precision and detail to define the works for adequate and complete execution.
- VERIFY that the legislation and regulations in force applicable to the Project have been taken into account.
- ANALYZE Project documentation in order to detect faulty definitions, omissions and contradictions.

During the EXECUTION of the works, the proposed actions, adopted solutions and follow-up must be documented. To this end, a section with these contents must be created in the Quality Plan, including a schedule listing modification proposals and their dates of submission and approval.

Identification and traceability

TRACEABILITY is the ability to determine the location of a specific material on the works site by means of recorded identification. For this purpose, a Works Site Fragmentation System must be established.

Works site fragmentation system

Each project unit under control shall be identified with a BATCH.

Each BATCH must undergo INSPECTION AND TESTING as per the Inspection/testing plan points.

In order to identify the location of each batch on site, it will be divided in chapters, sub-chapters, parts, elements and batches.

Due to their importance for the Projects that OSSA carries out, CONCRETE (sprayed, cast or solid), BOLTS and STEEL are subject to IDENTIFICATION AND TRACEABILITY.

A good identification and traceability system enables:

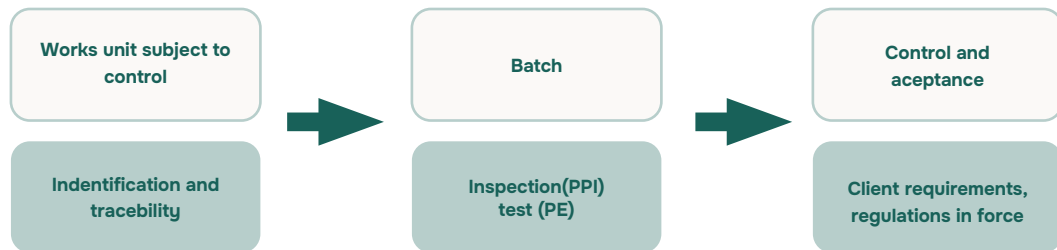
- AVOIDING the use of products for purposes other than those for which they were assigned.
- AVOIDING the utilization of products labeled as Retained or Rejected.
- The IDENTIFICATION of the batch condition vis-à-vis follow-up requirements.

A poor identification and traceability system involves:

- **NOT** having a record or location of the BATCHES subject to control.
- **NOT** being able to ADEQUATELY overcome problems derived from NONCOMPLIANT PRODUCTS.

Inspection and tests

The Works Quality Plan shall identify the works units subject to control. This quality control is carried out through the Inspection Points Program and Test Plan that shall be designed specifically for each.



The Inspection Points Program and Test Plan is the set of inspections and tests to be carried out to verify the acceptability of each batch.

The Inspection Points Programs and Test Plans are updated and completed together with the progress of the works and must be approved prior to the execution of the works each program refers to.

If any modifications arise in works units or construction processes, the appropriate Inspection Points Programs and Test Plans must be reviewed accordingly and be submitted to the Client for approval.

INSPECTION POINTS PROGRAM (IPP)

Each inspection must have the criteria for approval, batch, frequency and manager.

In addition, the program must specify which controls are CHECK POINTS, i.e., inspections that, due to their characteristics or significance, require stopping the activities awaiting a test, Client approval or other external control.

These inspections are related to NONCONFORMITIES which may be identified during the execution of the works.

TEST PLAN

The tests to be carried out are defined in the Test Plan which also indicates the frequency and standards to be applied. In addition, it is necessary to perform a regular (monthly) follow-up of the testing plan compliance to identify deviations.

Within the scope of activities carried out by the company, the most relevant tests are:

- Control of sprayed concrete compression resistance.
- Traction of bolts.

A good management of inspections and tests enables:

- Adequately fulfilling CLIENT REQUIREMENTS.
- Receive CLIENT APPROVAL of the units to be executed, avoiding subsequent CLAIMS.
- CONTROL on-site delivery of materials (Tests and Inspection) to identify deficiencies before these generate additional costs.
- COMPLIANCE with binding regulations.

Poor Management of inspections and tests could entail:

- NOT detecting ERRORS IN EXECUTION AND MATERIAL REQUIREMENTS at the right time, involving unnecessary additional costs.
- CLIENT CLAIMS for failure to execute according to requirements.
- NON-COMPLIANCE WITH OBLIGATORY REGULATIONS.

Process control

There are two types of procedures generated by the Quality Plan, as follows:

- **Procedures:** which define all issues related to the management system. The OSSA SIG procedures can be applied or adapted to each Project in accordance with Client requirements or agreements with partners.
- **The Technical procedures:** which define the way in which the work units shall be carried out. These procedures must develop the following contents:
 - Object and scope.
 - Materials to be applied and execution process.
 - Definition of means.
 - Quality control (IPP and Tests).

Procedures

- PRODUCTION PLANNING AND CONTROL
- DOCUMENTATION CONTROL
- COMMUNICATIONS
- HUMANS RESOURCES
- CONTROL AND MAINTENANCE OF MACHINERY
- PROCUREMENTS AND SUBCONTRACTS
- ANALYSIS MEASUREMENT AND IMPROVEMENT
- AUDITS
- NON CONFORMITIES

Technical procedures

- DRILLING AND BLASTING
- MECHANICAL EXCAVATION
- MUCKING OUT
- TUNNEL SUPPORT
- WATERPROOFING OF TUNNEL.
- CONCRETE
- EXCAVATION CONTROL

Management of procurement and subcontracts

PROCUREMENT

All purchases of products or subcontracts of services which could impact on the quality of the work shall be procured in two stage: an initial planning of requirements and a subsequent individual process for each purchase. At all times environmental and labour risk prevention requirements must be fulfilled.

The initial planning is extremely important for adequate logistics and the volume of the purchase .

- Preparation of the purchase order and the TPS (technical procurement specification).
- Comparison of proposals made by suppliers.

EVALUATION OF SUPPLIERS

Suppliers of products, works and services shall be selected according to their capacity to meet specifications and to supply products accordingly. Suppliers will be monitored as regards quality standards with results being recorded on an individual file. Suppliers will be evaluated **twice a year**.

LIST OF STANDARDIZED NORMS FOR CONSTRUCTION PRODUCTS (CE)

Some products are required to fulfill the conditions specified in the list of standardized norms for construction products which is updated regularly and can be checked

Product preservation

In order to check the quality of materials and projects subject to control, a Reception and Storage Control Plan (RSCP) shall be developed.

This plan establishes the criteria for:

- Reception checking.
- Storage checking.

The conformity of products shall be accepted by signing the delivery note.

In addition, the RSCP would establish the measures for stocking materials such as:

Explosives:

Explosives shall be stored according to the requirements of the organization in charge of regulating the storage and use of explosives in each country. As a general rule, explosives must be stored in a protected and secured facility, the key of which must be in the sole possession of the director and the personnel he may authorize.

Additives:

The concrete-producing facilities must have stores for keeping the range of additives to be utilized in order to guarantee require production rates. In facilities of tunnels or places where sprayed concrete shall be applied, stores must be arranged for storing catalysts.

Aggregates:

Aggregates to be used in concrete production sites must be stored separately per size in order to avoid contaminations.

Steel:

Stocks of steel for reinforced concrete must ensure that production is not delayed due to lack of stock. In order to avoid degradation of this steel, it must not be left on the ground.

Cement:

Cement must be stored in a dry place, either in silos (large volume supply) or adequately packaged if supplied in bags.

It must be verified that the cement has the necessary specifications (strength type, additives, special uses (sulphur resistant, seawater resistant, low hydration temperature).

Prefabricated items:

It is important to keep adequate stock as extended stock periods could cause deterioration in prefabricated items which may render them unusable.

In addition, prior verifications must be made in structural elements during the manufacturing process and upon reception to check that the design requirements are met.

Measurement equipment control

This procedure aims at ensuring control, tuning and adjustment of inspection, measurement and testing equipment in order to maintain its precision within accepted limits during the execution process.

A Gauging/Review Program must be performed on said equipment, consisting of a checklist which includes the periodicity of scheduled adjustments. (Gauging and verifications).

In addition, subcontractor and quality control laboratory equipment must also undergo the necessary revisions of their testing and measuring equipment.

Nonconformities, audits, claims

NONCONFORMITIES

A nonconformity on-site is noncompliance with or deviation from a quality requirement established by the Management System, Quality Plan, Project, Drawings, Technical Specifications Sheets, Regulations, Administrative Clauses, etc.

The CAUSES that could give rise to the issuance of a A Nonconformity Report are the following:

- Noncompliance of quality objectives.
- Faulty execution of works units and procedures.
- Defects in audits or in the application of the Quality Plan.
- Deviations in supply of materials, products and services involving quality.

- Deviations in the execution of the works units, as regards the geometric variations or new units, without the corresponding conformity of the Works Management.
- Noncompliance of the Inspection Points Program (PPI) or the Test Plan (TP).

In all cases it is necessary to REPORT TO THE CLIENT any product/installation which, being a nonconformity, was taken as accepted for any reason. It is necessary to request Client conformity in writing whenever this is a contractual and compulsory requirement.

AUDITS

In order to verify compliance with the Quality Plan of each work site within the Quality Management System, the quality Department manager at OSSA headquarters schedules annual audits in each work site.

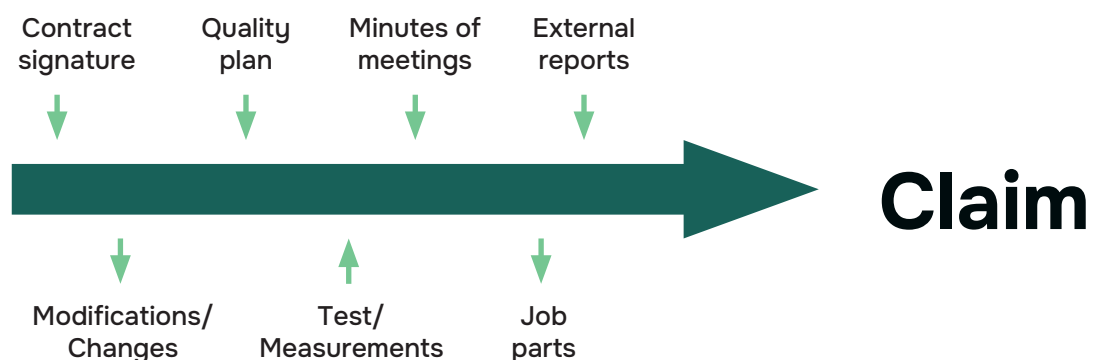
The audits will be notified to the Quality and Environmental Technician assigned to the site through e-mail with 15 days in advance. A report is issued after the audit and sent to the works site.

CLAIMS

In some cases there are processes or small units within a process which are not detailed in the Project or Contract or different in their execution due to a Client request. In these cases it is necessary to send a description of the execution to the Client in order to obtain approval in writing.

This is important for 2 reasons:

- To make sure that the Client approval for the execution is obtained.
- If applicable, an economic assessment must be added if it was not included in the Project budget.



As shown in the diagram, the preparation of a claim requires an initial and comprehensive review of the Project and Contract to confirm that the claim is necessary.

When the claim has been prepared and approved by the Client, it is important to collect all the technical information and documentation related to the execution (minutes of meetings, modification or change proposals, reports of tests and measurements of the execution, job parts and if applicable external reports) to justify the content of the claim once it has been finalized.

Final works documentation

When delivering an executed Project it is necessary to present the FINAL WORKS DOCUMENTATION or AS BUILT. This documentation comprises all the documents that demonstrates that the requirements established by the ISO 9001 and 14001 standards have been fulfilled throughout the construction process and detailed in the Quality Plan. The presentation of this document is different for each Client and must be adapted to Client requirements as much as possible.

It is advisable to agree the form of presentation at the beginning of the works in order to prepare the documentation accordingly throughout the execution of the project.

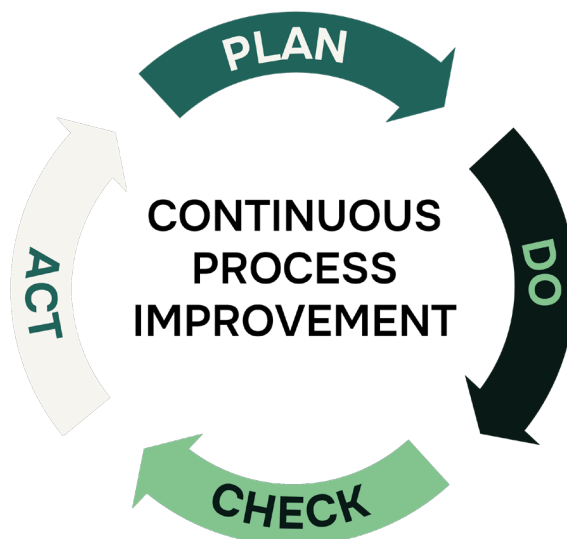
05. Quality, a way of working. Continuous improvement

Quality must be perceived and applied as a way of working.

Ongoing improvement is closely linked to quality and allows activities to develop efficiently according to requirements. Ongoing improvement must be a proactive task instead a simple reaction to problems when they arise. OSSA endeavors to meet or exceed Client requirements and to improve internal objectives.

The basic rules for ongoing improvement are:

- Nothing can be improved if it has not been CONTROLLED.
- Nothing can be controlled if it has not been MEASURED.
- Nothing can be measured if it has not been DEFINED.
- Nothing can be defined if it has not been IDENTIFIED.



The implementation of a quality improvement system is based on the skill to identify and resolve problems or deviations between what should be happening and what is actually happening. In addition, said deviation should be important enough for someone to realize that it must be corrected. In this sense, a quality system which is adequately implemented at all process levels needs to be reviewed and compared.

For this purpose, it can be said that:

1. If the results are not measured it cannot be known if the expected deviation correction has been successful.
2. If said success cannot be seen it cannot be rewarded and, if it cannot be rewarded the reward would go to the deviations.
3. If an error cannot be recognized it cannot be corrected.

A system that does not measure results will not be able to manage errors effectively, and said errors have a direct bearing on the quality of the services rendered by OSSA. This means that said errors will be noticed and discovered sooner or later by clients who will tend to claim or reject the product.

06. The cost of not quality

The COSTS of NOT FOCUSING on QUALITY are all the costs which would not have occurred if the quality with which we carry out our activity was PERFECT.

“QUALITY IS NOT EXPENSIVE. WHAT IS EXPENSIVE IS THE LACK OF QUALITY”.

- By increasing quality the costs derived from correcting nonconformities are diminished.
- The cost of processing complaints and claims are lower.
- If the same mistakes are not repeated, the cost of repeated faulty work diminishes.
- Satisfied clients create a climate of harmony and good reputation in the Organization.
- A good reputation is one of the best qualities an organization can have, as it becomes a reference for many other organizations.

info@ossaint.com
+34 917 823 400
C/ Isla Graciosa, 1 - 2ª Planta - Puerta 4
28703 San Sebastián de los Reyes (Madrid) Spain
www.ossaint.com

