Quality Control

Introduction

Quality Control (QC) is an aspect of logistics management that is rarely applied, partially applied or completely ignored. More so in emergencies where speed of delivery over-shadows aspects or activities that would otherwise provide checks and balances in a sector that already has so much at stake.

For the purpose of the LOG, simple aspects of QC are highlighted to provide basic knowledge that can be applied in emergency situations. In an emergency situation, it is not practical to initiate complex, involved quality control processes. Some organisations are likely to already have institutional specific QC processes in place.

Why quality management is important in humanitarian activities and humanitarian logistics:

- the need to demonstrate the ability to consistently provide product/services that meets user, donor and applicable statutory and regulatory requirements;
- the goal of enhancing user satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to user and applicable statutory and regulatory requirements; and
- to support the achievement of sustained success.

These systems assist in ensuring professional and high quality service delivery, leading to improved outcomes/less suffering for beneficiaries.

Definition

Quality Control (QC)

1. The operational techniques and activities that sustain the product or service quality to specified requirements.
2. Operations intended for the assessment of the quality of products at any stage of processing or distribution.
3. Part of quality assurance intended to verify that components and systems correspond to predetermined requirements.

QC is therefore the process of ensuring that products/services required are received as is prescribed, in a timely, cost effective and efficient manner, through the application of well established systems and procedures. A QC system will therefore also measure whether standard operating procedures are in place, that they operated effectively and were strictly adhered to.

Quality Assurance

“Planned and systematic action that is necessary to provide adequate confidence that a product or service will satisfy given requirements for quality.” (IFRC)

Quality Improvement:

It can be distinguished from QC in that quality improvement is the purposeful change of a process to improve the reliability of achieving an outcome.

In the humanitarian context it is sometimes defined as:
"the minimum level of performance that fulfils a requirement." (Concern)

Or

"…..the compliance with the technical specifications initially elaborated during the needs assessment." (Action Contre la Faim- ACF)

Some terminologies that are commonly used in relation to quality are: performance, compliance, standards, specification and conformity.

Logistics QC (LQC) is by no means a measure of quantitative throughput or output. Nor is it intended to set-up competition between different operating logistics functions, but a mechanism that ensures that needs are satisfactorily met.

Inevitably, at the onset of an emergency, some systems may not function well. Certain operational procedures may be absent. Clearly, LQC has implications for efficiency, cost effectiveness and output. Where all standard logistics procedures are shown to be operating correctly, there is less likelihood of waste or delay. LQC allows the logistics officer to quickly identify areas for immediate attention. The periodic running of LQC will allow the Logistics officer to maintain his/her operation efficiently and to avoid the erosion of standards.

**Nature of quality control**

QC is cross cutting through the entire logistics function. It enhances efficiency, effectiveness, and differentiation throughout. There are three related areas of focus for value creation:

**Goals.** Objectives must be set for achieving internal and external user satisfaction. This involves finding out exactly how 'users' perceive the services rendered by the logistics function as a whole.

**Responsibilities.** Determine and assign responsibility for systems and processes that are necessary for creating and sustaining user satisfaction. In many instances, this responsibility spans traditional functional boundaries and may even require re-engineering of some processes.

**Benefits.** User needs and expectations must be incorporated into the process of logistics delivery, transforming basic functions into benefits that yield value.

QC, when used in conjunction with monitoring and evaluation, leads to a formalisation of the quality process.

**Quality Control Tools**

- Check-lists
- Questionnaires
- Inspection procedures. These can be internal or through outsourced companies such as SGS (www.sgs.com), Bureau of Veritas (www.bureauveritas.com), Cotecna (www.cotecna.com), etc. The inspection may be based on:
  - chemical Composition;
  - physical attributes; and
  - standard operating procedures adopted.

**Formulation of a QC Process**

The evolution of a QC process, is a movement through four distinct phases with notable characteristics:

1. **Quality Control (QC).** Quality control entails the basic procedural and statistical management of quality:
   - defect-free services;
   - management-driven

2. **Quality Assurance (QA).** A greater emphasis on achieving user/user satisfaction through user/user-driven quality characterises. This is the shift from QC to QA:
   - 100% satisfied user/user;
   - user-driven.

3. **Total Quality Management (TQM).** All stakeholders, i.e. management, suppliers, users/users and employees all aligned and working together towards a common goal and ensuring quality service provision. It would cover monitoring of all aspects of management, staff, users/users satisfaction, systems implementation, adherence to processes and procedures and supplier performance. The above characterise the evolution to TQM.
   - Significant gain for all stakeholders.
   - Common goals.

4. **User Value.** User value reflects the need to do things that create the best competitive net value for the user.

**Quality Control Cycle**

Systems and processes are a part of QC. QC is used in developing systems that ensure that goods and services delivered meet or exceed user expectations. It not only verifies the delivery of good quality but also identifies gaps and failures that need to be addressed.
Diagram 1: Quality Control cycle

Management system

Management system refers to what the organization does to manage its processes, or activities, so that its products or services meet the objectives it has set itself, such as:

- satisfying the customer’s quality requirements;
- complying with regulations, and
- meeting environmental objectives.

Management system standards

Management system standards provide a model to follow in setting up and operating a management system. This model incorporates the features on which experts in the field have reached a consensus as being the international state of the art.

Implementing a Quality Control System

Application in Humanitarian Logistics
• Development of standard procedures and processes to assist in the rapid establishment of logistics.
• These systems assist in ensuring professional and high quality service delivery, leading to improved outcomes/less suffering for beneficiaries.
• Working with suppliers to create specifications of items that are easy to make (lower cost, higher quality, quick to produce) and meet user requirements for example, tarps, tents, etc...
• QC tools and techniques in Cold Chain.
• Provide some examples of tools used such as quality checklist mentioned above and tools used to ensure products meet specifications such as the use of inspection agents.

Set the parameters or bench mark

This process is initiated when users place requests for products or services. When submitting a request, the requester of a product has to provide the logistician with the technical specifications.

Note: different standards will apply for different products or services. For products on international markets, international standards define most of the requirements. Within the humanitarian community, there are specific relief standards set for commonly used products. Some common sources are the sphere book, interagency set-ups or organisational specific catalogues.

See Standards in the Annexes for more information.

Importance of the technical specifications:

• the selection of the supplier, through a quotation or tendering process;
• the purchasing contract, the technical specifications are commonly joined as an annex to give the exact description of the product;
• the conformity certificate: a laboratory or inspection company need the technical specifications in order to issue the certificate attesting that the product delivered is complying or not with requirements;
• the delivery inspection: when receiving the supply the storekeeper will verify that the delivery matches with the product requested; and
• products will be accepted only if the QC and the result of the delivery inspection correspond to the technical specifications.

Quality control sheet

When working on the technical specifications, the requester should provide exhaustive information on the services or products required.

For example:

Food

• Smell
• Taste (only for products for human consumption)
• Colour
• Physical characteristics (size of the grains, powder)
• Solubility (if relevant)

Spare parts

• Design
• Part number
• Shape
• Material used/or chemical composition
• Tensity

Fabrics

• Colour
• Weave
• Texture

QC sheets are used to specify areas of focus and in conjunction with tools that measure performance or compliance against set parameters. Questionnaire and check-lists are some of the simple but effective QC tools. They are user friendly and can be used manually or electronically. Below is an example of a simple electronic tool.

Such a tool may be contained in an MS Excel file. The worksheets contain a series of topic-specific questions related to logistics aspects such as, warehousing, fleet, procurement and customs clearances and a graphic representation of the results is generated automatically from answers to questions on preceding pages.

See Quality Control Check Lists.

How to use the questionnaire or check-list worksheets:

Step 1:
Select the appropriate worksheet and answer the questions by clicking in the relevant box (use the mouse or arrow keys to navigate from one box to another); enter any letter (Y, N, X, etc.) in the designated box.

Step 2:
Select only one of the boxes: ‘YES’, ‘NO’ or ‘PARTIALLY’ according to the following definitions:

- yes: more than 80 per cent implemented;
- no: less than 20 per cent implemented; and
- partially: between 20 and 80 per cent implemented.

Example, a Warehouse Worksheet may ask:

“Are bin cards issued and filled correctly, recording all info?”

- YES would mean, over 80 per cent of the stocks have pre-numbered bin cards and all stock movements have been properly recorded.
- PARTIALLY would mean, bin cards are being used but between 20 to 80 per cent of warehouse stocks have no cards and/or the cards are missing relevant stock-movement information.
- NO would mean less than 20 per cent of the required bin cards have been issued and/or completed.

System information guide

Only one box must be selected for each question. Care must be taken when inputting the answers as the spreadsheets have not been automated to prevent double entries; e.g., answering both YES and PARTIALLY for the same question. Nor will it indicate when the answer to a question has been omitted. On completion of each page double-check that every question has been answered and only one box has been checked.

The questions are not weighted: each carries the same value as the others on the sheet.

In an excel format, as the questions are answered, a percentage is automatically calculated for each sub-group on the right-hand side of the worksheet. Similarly, a total performance figure will be calculated on the bottom right-hand side of each worksheet; these totals are represented automatically in graphic form on the final worksheet.

Procedural updates

As the tool is used over time, it is important that changes in procedure are reflected in the QC system. Similarly, weaknesses in systems that are highlighted by the QC process should be corrected by procedural changes. Feedback is provided through periodic management reports. (See attached electronic version)

Along with the use of tools, the logistician must remember key things required in the normal logistics processes that support a QC system. Some examples:

- documentation required from the supplier: certificate of conformity, certificate of origin, delivery notes, etc. that the supplier has to provide;
- sampling and laboratory analyses: the contract has to mention the place and moment of sampling, the person or company who will perform the sampling, the method, the time between the QC and the delivery inspection. Frequently, the buying organisation is responsible for the analyses and inspection costs, whilst the supplier replaces the missing quantities or damaged packaging used for sampling;
- delivery inspection: the contract has to mention the place of delivery inspection, the person or company who will perform the inspection (when not done by the organisations employees) and the components of the inspection (documentation, quantity and quality);
- acceptance of products: the contract must include the acceptance modalities of the products, the penalties in case of non-compliance with the technical specifications. In case of non-compliance the supplier has to replace the products and will have to support all the costs related to this replacement.
Diagram 2: Quality system process

Throughout the process demonstrated in the diagram above, numerous documents are generated. These documents support an efficient QC system. One example is the user request. See below some quality control guides for selected products. The information can be found in the user request.

Sample Quality Control Guide for Products

Agricultural Tools

The technical specifications should at least define:

- a description of the shape or a drawing;
- the minimal and maximal weights;
- the size;
- the type of metal or other components; and -the presence of a handle or not, and if relevant its description.

When feasible, the logistician will request a sample from the various potential suppliers and will evaluate the quality with the technical officers.

Fertilizers or pesticides

The logistician must refer to the FAO guidelines for storage and transportation to prevent accidents.

Seeds

The following criteria must be taken into consideration for the quality control of seeds:

- genetic quality;
- physiological quality;
- what percent of seeds planted begin to grow during a given period;
- specific quality:
  - this refers to the percentage of inert materials (debris, pebbles, etc.) and broken or otherwise damaged seeds that make up a given quantity of seeds;
  - phyto-sanitary quality.

This refers to whether there are parasites and/or diseases in or on the seeds, or with them.

The following tests and analyses require very few materials and can be organised even at the base level:

- germination rate
- percentage of pure variety
- percentage of damaged seeds
- percentage of other substances (in weight)
- percentage of other crop seeds present
- percentage of weed seeds present

Note: when time is limited and does not allow a laboratory analysis a field germination test is the minimal precaution to guarantee an acceptable quality.

Medical supplies

From a logistics the point to note is that pharmaceuticals have preset standards and are or should be certified before they are purchased. Some key things to verify when receiving pharmaceuticals are:

Procedures for the quality control: the respective unit should work closely with the logistics department and submit a well documented request providing:

- description – state the drug required giving the exact specifications and batch number;
- expiry date;
- previous Supplier or provider of the drug;
- fact observed;
- chronology;
- any anticipated quality flaw to look out for;
- important remarks;
- copy of related documents;
- packaging – check for broken seals;
- composition – verified by technical unit(pharmacist/doctor/nurse); and
- storage conditions.

In cases where products are being manufactured specifically for an organisation on request, it is imperative to contract an inspection company or laboratory to test for quality compliance and ensure that the testing is in conformity with all customs requirements of the country or region where the product is destined.
Dependencies

The success of a tool or a quality system is dependent on the following:

- the staff must be well trained to use the tool. Regular training of all personnel in the use of QC systems is essential for the success of QC;
- use of the tool must be consistent. The entire logistics team needs to be committed to the QC system and understand that it is an enabling tool, a tool which makes their job easier and more effective;
- required changes must be implemented to get the correct results. The use of staff feedback is vital to ensuring the continued relevance of QC systems to the practical aspects of the function; and
- the tool must be simple and easy to use.

Conclusion

This topic provides a basic understanding of QC. QC should be applied across all logistics and supply chain activities. Carefully selected QC criteria are a vital management tool which enables an organisation to monitor and evaluate performance and thus sustain continuous improvement. QC data also provides the metrics essential to providing justification for staffing and funding.

Applying and improving quality management provides benefits such as reduced costs, shorter lead times, the right products being received, timely delivery of services, etc for the logistician and internal users and leads to improved outcomes/reduced suffering for beneficiaries through x,y,z.

It is important to maintain management attention on quality in order to continuously improve the delivery of humanitarian support to the affected communities.

References

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- International Organization for Standardization
- Lean Six Sigma that Works, Bill Carreira and Bill Trudell, AMACOM- Link