

### Introduction

The Quality Management Plan is an integral part of any project management plan. The purpose of the Q

The Quality Management Plan for the Loose Tube Fiber Cable (LTFC) project will establish the activities

- Ensure quality is planned
- Define how quality will be managed
- Define quality assurance activities
- Define quality control activities
- Define acceptable quality standards

### Quality Management Approach

This section of the Quality Management Plan describes the approach the organization will use for manag

The quality management approach for the LTFC project will ensure quality is planned for both the produ

Product quality for the LTFC project will be defined by the company's current standards and criteria for it

Process quality for the LTFC project will focus on the processes by which the project deliverable will be

The project team will work with the Quality Group to define and document all organizational and project

Metrics will be established and used to measure quality throughout the project life cycle for the product a

- Schedule
- Resources
- Cost
- Process performance

- Manufacturing line utilization
- Material waste
  
- Product performance
- Attenuation
- Tensile strength
  
- Customer Satisfaction (as a result of field trials)

Quality improvements will be identified by any member of the project team or quality group. Each recom

### **Quality Requirements/Standards**

This part of the Quality Management Plan should describe how the project team and/or quality group wil

#### Product Quality:

The product quality standards and requirements will be determined by the project team and quality group

As trial products are measured at pre-determined intervals, we will know that the product is compliant wi

#### Process Quality:

The process quality standards and requirements will be determined by the project team and quality group

As trial products are created, the process metrics will be measured and analyzed to determine the quality

### **Quality Assurance**

Here the Quality Management Plan should explain how you will define and document the process for au

The quality assurance of the LTFC Project focuses on the processes used in the manufacturing of the L

The LTFC Project Manager and the project team will perform assessments at planned intervals through

**Process Action**

**Acceptable Process Standards**

**Process Phase**

**Assessment Interval**

Filter Tube Buffering

- < 20 feet fiber waste per tube
- < 0.5 lbs PR waste per tube
- < 8 minutes per linear km of buffer tube

Buffering

Daily or per run

Filter Tube Stranding

- < 10 feet of waste per stranded core
- < 12 minutes per linear km of stranded core

Stranding

Daily or per run

Core Jacketing

- < 15 feet of waste per jacketed cable

- < 3 lbs PE waste per cable

- < 12 minutes per linear km of jacketed cable

Jacketing

Daily or per run

The quality manager will provide day to day quality management and conduct process audits on a weekly basis, monitor process performance metrics, and assure all processes comply with project and organizational standards. If discrepancies are found, the quality manager will meet with the Project Manager and review the identified discrepancies.

The Project Manager will schedule regularly occurring project, management, and document reviews. In these reviews, an agenda item will include a review of project processes, any discrepancies and/or audit findings from the quality manager, and a discussion on process improvement initiatives.

Process improvement is another aspect of quality assurance. Quality assurance reviews, findings, and assessments should always result in some form of process improvement and, as a

result, product improvement. All process improvement efforts must be documented, implemented, and communicated to all stakeholders as changes are made.

## **Quality Control**

In this section the Quality Management Plan describes how you will define and document the process for monitoring and recording the results of executing the quality activities to assess performance and recommend necessary changes. Quality control applies to the project's product as opposed to its processes. It should include what the acceptable standards and/or performance are for the product and how these measurements will be conducted.

The quality control of the LTFC project focuses primarily on the LTFC product and the acceptable standards and performance. The quality performance standards for the LTFC Project are in accordance with the organizational standards of performance of all fiber optic cable products. However, there are several project-specific quality standards which were established specifically for the LTFC Product. All trial cables which are produced will be submitted to the characterization group for standard loose tube cable performance testing. Additionally, all physical measurements will be conducted on each produced cable to ensure compliance with established quality standards. The table below illustrates all performance and physical quality standards for the LTFC Product:

**Product**

**Physical/Performance Standards**

**Quality Assessment Activities**

**Assessment Intervals**

6-36 fiber loose tube

cable

0.75" +/- 0.01" diameter  
> 300 N/m<sup>2</sup> Tensile Strength  
< 5% attenuation at 625nm wavelength

Lab and field testing

Per produced cable length

42-188 fiber loose tube cable

1.5" +/- 0.01" diameter  
> 450 N/m<sup>2</sup> Tensile strength  
< 5% attenuation at 625nm wavelength

Lab and field testing

Per produced cable length

194-288 fiber loose tube cable

2.25" +/- 0.001" diameter
> 600 N/m <sup>2</sup> Tensile strength
< 5% attenuation at 625nm wavelength

Lab and field testing
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Per produced cable length
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The project team will perform all physical measurements on their trial cables. The characterization group will perform attenuation testing and will provide the results back to the project team within 3 business days after the test sample is submitted. The quality group will ensure all physical and performance standards are met for each trial cable, perform audits, and assist the project team with creating or updating all documentation related to product quality.

The Project Manager will schedule regularly occurring project, management, and document reviews. In these reviews, an agenda item will include a review of products, any discrepancies and/or audit findings from the quality manager, and a discussion on product improvement initiatives.

It is imperative to the success of the project that all of the established physical and performance standards are met. By doing so, the LTFC Project Team will ensure that the product achieves the high level of customer satisfaction anticipated and that future operational cable production will be in line with budget and resource allocations.

### **Quality Control Measurements**

This section of the Quality Management Plan should contain a sample or useable table/log to be used in taking quality measurements and comparing them against standards/requirements. These forms may be found in many different styles or formats. The most important aspect of this log is to provide documentation of the findings in the Quality Management Plan. If actual measurements do not meet the standards or requirements then some action must be taken.

This may be done in regularly scheduled project status meetings or as necessary throughout the project lifecycle.

All LTFC Project products and processes must be measured and fall within the established standards and tolerances. The below logs will be used by the project and quality teams in conducting these measurements and will be maintained for use as supporting documentation for the project's acceptance.

### Quality Assurance Log

**Trial #**

**Date**

**Process Measured**

**Required Value**

**Actual Measured**

**Acceptable? (Y/N)**

**Recommendation**

**Date Resolved**



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