



A Division of Transnet SOC Limited

TECHNOLOGY MANAGEMENT PROCEDURE

NEW MATERIALS AND EQUIPMENT APPROVAL PROCESS FOR TFR

Author: Senior Engineer
Technology Management, EET

P Croucamp

Handwritten signature of P Croucamp on a dotted line.

Authorised: Principal Engineer
Technology Management, EET

K Motupa

Handwritten signature of K Motupa on a dotted line.

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1.0 SCOPE

This document serves as a procedure that is to be followed when accepting new material and equipment into Transnet Freight Rail's (TFR) operating environment.

2.0 BACKGROUND

New material and equipment are constantly being developed by industry experts to mitigate risks, improve performance, and address challenges within the railway engineering field. New material and equipment can be defined as recently developed or acquired tools, machinery, devices, or technology that are introduced to perform specific tasks or functions more efficiently or effectively. It can either be provided by suppliers/agents/manufacturers that have or have not previously supplied the material and equipment to TFR or who have not supplied TFR with the material and equipment for a period of at least 5 years, and must be verified to be compliant to updated specifications and standards if any.

Such material and equipment is crucial for the availability of the network and ensuring that the network is operating at capacity. Before material and equipment are accepted into TFR's operating environment, it is subjected to various processes, one of which is Quality Assurance. Quality Assurance (QA) is critical in ensuring that material and equipment supplied to Transnet meets the technical specifications and standards as set out by Transnet. As such, there is a process that must be followed from requirements analysis to post implementation/installation of the equipment.

For new material, equipment or suppliers/agents/manufacturers to TFR, the entire duration of this process is approximately 205 days, which includes a minimum of 180 days for in-service evaluation. However, some equipment may have in-service evaluation of one (1) year if it must be assessed in various seasons making this process duration almost 400 days. It is worth noting that the process outlined in Table 1 does not account for the lab testing stage which is predominantly performed by the product developer before providing the material or equipment to TFR for in-service evaluation.

3.0 MATERIAL AND EQUIPMENT APPROVAL PROCESS DURATION

Table 1: Material and Equipment Approval Process Duration

STAGE	DESCRIPTION	DURATION (days)	CUMMULATIVE DURATION (days)
1	Requirement Analysis	1	1
2	Pre-Testing Preparation	3	4
3	Initial Inspection and Verification	3	7
4	Functional Testing	2	9
5	Performance Testing	1	10
6	Safety and Compliance Testing	1	11
7	Environmental Testing	1	12
8	In-service Evaluation	180	192
9	Data Analysis and Reporting	10	202
10	Review and Approval	2	204
11	Documentation and Handover	1	205
12	Post-Approval Monitoring	-	-

4.0 TECHNICAL APPROVAL PROCESS FOR NEW MATERIAL AND EQUIPMENT

Table 2: Process for Acceptance of New Material and Equipment

PROCESS STAGE	DESCRIPTION OF STAGE	OBJECTIVES	ACTIVITIES	DURATION
1	Requirement Analysis	The requirements are gathered to accurately define the material and equipment's requirements and intended use.	Gather and document technical specifications.	1 day
			Identify performance, safety, and compliance requirements.	
			Establish acceptance criteria.	
2	Pre-Testing Preparation	Prepare for the testing process.	Test Plan Development: Create a detailed test plan outlining test objectives, methods, resources, schedule, and responsibilities.	1 day
			Test Environment Setup: Ensure the test environment is ready, including required tools, software, and calibration of measuring instruments. This instruction is given to the OEM.	2 days
3	Initial Inspection and Verification	Conduct an initial assessment of the equipment.	Visual Inspection: Inspect for physical defects, damage, or discrepancies from specifications.	1 day
			Documentation Review: Verify all accompanying documentation, such as manuals, pre-test certificates, and compliance reports, is complete and accurate.	
			Baseline Measurement: Analyse initial measurements conducted, and test certificates submitted by the OEM / supplier to verify that the equipment complies to the requirements specified before TFR QA does the in-person inspections and tests	2 days
4	Functional Testing	Ensure the material and equipment functions as intended.	Operational Tests: Test the equipment under normal operating conditions (if possible) and record performance data.	2 days
			Feature Testing: Test all features and functionalities to ensure they function as specified by TFR.	
			Stress Testing: Subject the equipment to loading conditions to evaluate performance under stress (if required).	
5	Performance Testing	Assess the material and equipment's performance against specified criteria.	Accuracy and Repeatability Tests: Verify the precision and accuracy of measurements or outputs. This depends on the type of material and equipment being subjected to QA inspection and tests.	1 day

6	Safety and Compliance Testing	Ensure the material and equipment meets all safety and regulatory standards.	Test for electrical safety, mechanical safety, and other relevant safety aspects. Verify compliance with industry standards, regulations, and certifications (e.g. SANS, IEC, British etc...).	1 day
7	Environmental Testing	Evaluate the material and equipment's performance under various environmental conditions.	Temperature, Altitude and Humidity Tests: Test the equipment under different temperature, altitude and humidity levels. This depends on the type of equipment being subjected to QA inspection and tests.	1 day
8	In-service Evaluation	Test the material and equipment as installed within the TFR operating environment.	Evaluate the equipment as installed in TFR's operating environment for a duration determined by the subject matter expert / technology owner with minimum 6 months in-service evaluation period. (Material and equipment which is installed on the Overhead Track Equipment can be tested for a period of 12 months at the discretion of TFR Technology Management)	180 days
9	Data Analysis and Reporting	Analyse test results and compile a comprehensive report.	Data Compilation and Analysis: Gather and organize all test data (including in-service evaluations) which will inform if the supplier will be issued with a conformance or non-conformance report/certificate and acceptance of new equipment. Perform a detailed analysis to identify trends, anomalies, and areas for improvement.	5 days
			Reporting: Document the findings, including detailed test results, deviations from specifications, and compliance status. Issue conformance report or non-conformance report detailing which tests have failed as per the specification and in-service testing	5 days
10	Review and Approval	Obtain final approval based on test results.	Conduct a review meeting with stakeholders to present findings and discuss any issues.	1 day
			Identify and implement any necessary corrective actions for non-compliance or performance issues.	1 day
			Obtain sign-off from QA and other relevant departments/stakeholders.	
11	Documentation and Handover	Ensure all documentation is complete and hand over the equipment for operational use.	Final Documentation: Compile all test records, certificates, and approvals into a final document set and store in a digital storage facility such as a secure server, cloud etc...	1 day
			Handover: For accepted equipment, transfer the equipment to the customer (operational team or depot) with all relevant documentation and training materials if required.	
12	Post-Approval Monitoring	Monitor the equipment's performance in actual use.	Conduct monitoring to ensure the material and equipment performs as expected and establish a feedback loop to gather ongoing performance data and user feedback.	-

5.0 NEW MATERIAL AND EQUIPMENT APPROVAL PROCESS FLOW DIAGRAM

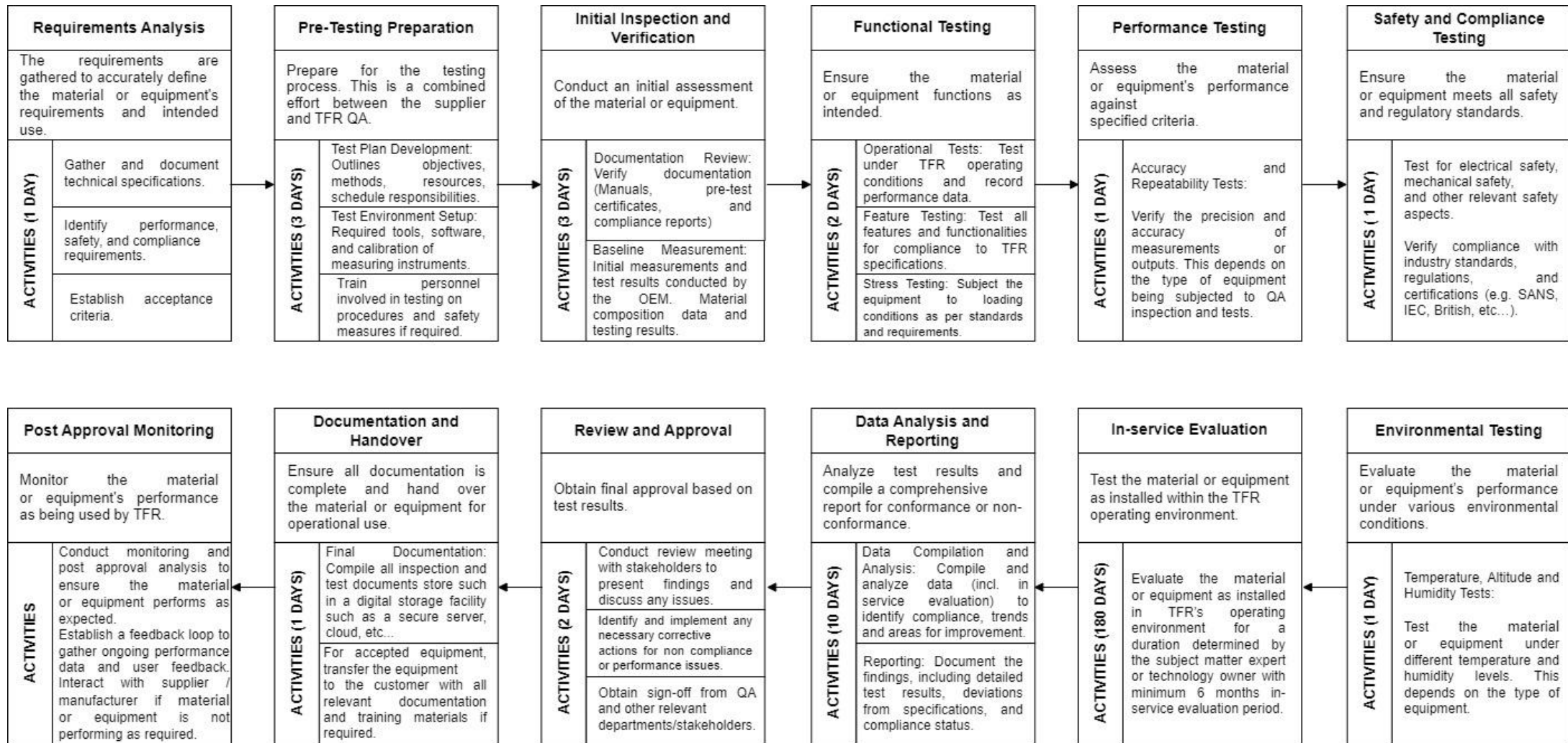


Figure 1: Process Flow of New Material and Equipment Approval