



**EchoStar Technologies L.L.C.
Standard Operating Procedure**

Supplier Requirements Document

**105450
Revision AN**

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I. APPROVALS

Refer to “REVISION HISTORY”, section III

II. PREPARED BY

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III. REVISION HISTORY

This document and all procedures will be reviewed once each year to determine if changes are necessary. Changes to any of the systems described in this manual will require updating via the Engineering Change Order (ECO) system.

Date	Rev	ECO	Description of Change	Review Team
10-02-00	AA	C6719	Initial Document Release	Ben Robinson, Jill Blocher
12-14-01	AB	C8962	Document Update	Ben Robinson, Jill Blocher
6-25-03	AC	C11380	Document Update	Ron Meier, Ben Robinson, Kolby Breitenstein, George Hansen
3-16-05	AD	C15566	Document Update	Ron Meier, Ben Robinson, Kolby Breitenstein
10-9-06	AE	C18405	Document Update	Ron Meier, Ben Robinson, Kolby Breitenstein
4-16-07	AF	C20846	Document Update	Ben Robinson
7-2-07	AG	C21443	Identify 105026 as Internal. EchoStar internal only	Ben Robinson
2-10-09	AH	C26842	Rev H. Add Supplier Scorecard information. Section 7.9. Add to CAR.	Ben Robinson
5-4-10	AJ	C28933	Add ESD compliance and requirements for parts purchased from Distributors.	Ben Robinson
6-15-11	AK	C32017	Change EchoStar logo to current one; along with EchoStar name	Tanya Zutis
1-23-12	AL	C34090	Update Supplier Scorecard criteria	Ben Robinson

05-27-14	AM	C38895	<p>IV. References updated to reflect current documents. Also removed "Section" column since section could change with revision to individual document.</p> <p>Removed:</p> <p>110956; Obsolete 121929; Obsolete 119602; Obsolete 123479049-AA: Internal doc for generating CARs in Agile</p> <p>Add:</p> <p>131864; Documentation for Proper Hard Drive Handling/Usage 204296: OBA Test Procedure Development Supplier Code of Conduct</p> <p>Section 7.2.1: removed 110956 Section 7.2.2: removed section. Refurbished Products no longer EchoStar responsibility</p>	Ben Robinson, Barry Katona
02-27-15	AN	C40163	<p>Section IV. References. Added 207457; Supplier Packaging Requirements.</p> <p>Section 7.6 Packaging; Changed 100664 reference to 207457.</p> <p>Note: 207457 is a new SOP with packaging requirements that were removed from 100664.</p> <p>Section III Revision History Table; Updated format</p>	Ben Robinson, Barry Katona

IV. REFERENCES

Part Number	Description
123473765-AA	Doc, Common Cosmetic Workmanship Standards for new Product
105690	Outdoor Fastener Corrosion Specifications
124214	Supplier AQL requirements for Components and Assemblies
100664	SOP Labeling of Raw Material Shipping Containers, Packing Lists, and Bills of Lading
207457	Supplier Packaging Requirements
120313	EchoStar Pallet construction specifications
104791	First Article Inspection Procedure
108476	SOP Return to Vendor (RTV) Process for Purchased Material
117040	Controlled Production Build Document
142605	Corrective Action Request (CAR) 8D Feedback Document
131864	Documentation for Proper Hard Drive Handling/Usage
204296	Out of Box Audit (OBA) Test Procedure Development for Set Top Receivers
www.echostar.com Partner Resources	Supplier Code of Conduct

1.0 Introduction

The purpose of this document is to describe the Supplier Quality System of EchoStar L.L.C. as well as the requirements of EchoStar suppliers. Written procedures have been established and referenced for implementing the policies described.

EchoStar understands that suppliers are ultimately responsible for the quality and production processes of the products they supply. However, the EchoStar team is willing to assist in any way to maintain the high expectations and standards provided to customers. It is the responsibility of all EchoStar suppliers to adhere to any referenced supplier related document in section IV of this procedure.

2.0 Scope

This document applies to all suppliers that contribute to the manufacturing, repair and/or pack-out of EchoStar products. If the requirements stated in this document cause conflict with those of other documents, the following order of precedence shall be followed:

1. EchoStar Purchase Orders
2. EchoStar Engineering Drawings or Specifications
3. Supplier Requirements Document

Any product(s) not in compliance with this document is subject to rejection and return to the Supplier for credit, replacement, or check refund as decided by EchoStar Supply Chain Management.

3.0 EchoStar Quality Policy

The EchoStar Quality Department is committed to continually improving suppliers, processes and products in order to better satisfy customer's needs. The main goal of EchoStar Quality is to deliver 100% defect free products and services to EchoStar customers; on time, every time.

4.0 EchoStar Quality Mission Statement

The mission of EchoStar Quality is to team with manufacturing suppliers to deliver peak performance, affordable products to EchoStar customers along with high quality customer service and product development.

5.0 EchoStar Quality Objectives

The following objectives of the EchoStar Quality Department are on-going and accomplished in conjunction with manufacturing suppliers:

- 5.1 Deliver 100% defect free products and services to EchoStar customers: on time, every time.
- 5.2 Communicate with suppliers on a regular basis to understand how problems are being handled and resolved, evaluate supplier performance, and evaluate product performance.
- 5.3 Continue to improve and implement procedures to ensure products remain undamaged during transportation
- 5.4 Constantly develop new ideas to improve the reliability and efficiency of manufacturing processes.

- 5.5** Continue to analyze quality reports in an effort to capture potential problems and prevent the manufacturing of defective products.

6.0 Supplier Quality Requirements

6.1 Quality Systems Requirements:

6.1.1 Quality Systems

6.1.1.1 Quality System. Suppliers must be (1) ISO certified, or (2) have a fully documented and implemented quality system, EchoStar Quality may audit the system as needed.

6.1.1.2 Environmental. Suppliers must have a documented and implemented environmental system.

6.1.1.3 Third Party registrations. Suppliers will be notified by EchoStar if third party registrations such as ISO9001:2000, ISO 13485, ISO 14001, etc., become a requirement.

6.1.2 Other Requirements

6.1.2.1 Process Control. Identify and control their process and control points (visual inspection, x-ray inspection, testing, internal audits, etc.) to ensure that all product specifications are met and maintained. The supplier may be required to show archived proof of technologically appropriate inspection results when audited. This may in the form of visual inspection data or x-ray data (as an example), and must relate to specific serial numbers.

6.1.2.1.1 Suppliers are required to maintain process and inspection equipment at an acceptable interval as required by the machine manufacturer. Echostar must be informed if critical inspection equipment is not available. Echostar reserves the right to shut down production if critical equipment is found in a poorly maintained or non-functioning state.

6.1.2.2 Vendors. Manage the quality of their vendor's products. Vendor performance history and/or scorecards may be requested by EchoStar.

6.1.2.3 Process Changes. Report all significant process changes to EchoStar Quality and Manufacturing Engineering.

6.1.2.4 First Articles. Provide First Articles to EchoStar for approval after significant process changes. (Refer 7.8)

6.1.2.5 Data. Allow all data provided to EchoStar (in order to satisfy Quality requirements) to be used freely under the conditions of applicable non-disclosure agreements.

- 6.1.2.6** Continuous Process Improvement. Implement and maintain continuous process improvement methods including improvements in efficiencies, yields and the elimination of wastes.
- 6.1.2.7** Supplier Contact Information. Suppliers are expected to provide 24-hour support to EchoStar to manage rapid response to delivery, quality or issues. Primary, backup and escalation contact(s) information must be provided to EchoStar. Any changes to the contact information should be communicated at the time of change.
- 6.1.2.8** Governmental, Regulatory and Environmental Requirements. All suppliers must comply with applicable governmental, regulatory and environmental requirements. Including those of the countries where the products are manufactured as well as where it is consumed.
- 6.1.2.9** Ethical Conduct. Suppliers must be committed to ethical conduct and respect to human rights in accordance with the principles of internationally recognized social and ethical conventions.
- 6.1.2.10** ESD. Suppliers of ESD sensitive components or assemblies are required to have a factory ESD system that is compliant to ANSI/ESD S20.20 or equivalent.
- 6.1.2.11** AVL parts purchased from Distributors. Suppliers are responsible for all EchoStar AVL parts which are purchased from a distributor (not directly from the AVL supplier). This includes the verification:
 - 6.1.2.11.1** That the distributor is a certified and auditable source.
 - 6.1.2.11.2** Age to design functionality. (parts more than 24 months old)
 - 6.1.2.11.2.1** The supplier is required to verify the revision and/or date of the parts in regards to functionality in the product it is being built in to.
 - 6.1.2.11.2.2** As required or where there is question, EchoStar Component Engineering is to be consulted to assist in the verification of the parts.
 - 6.1.2.11.3** Parts have been functionally tested to meet EchoStar product requirements. Sample quantities should conform to standard 0.40 AQL S-2 rates.
 - 6.1.2.11.4** Parts are certified and documented to be:
 - 6.1.2.11.4.1** Authentic and not copied or counterfeit.
 - 6.1.2.11.4.2** New and not remanufactured, recovered or reclaimed parts.
 - 6.1.2.11.4.3** Production quality and not engineering sample parts.
 - 6.1.2.11.4.4** Not remarked in any way.
 - 6.1.2.11.4.5** Not from a rejected or low yield lot.
 - 6.1.2.11.5** Production yields do not exceed standard part expectations. Higher levels of production failure rates must be reported to EchoStar Quality.

6.2 TEST, PRODUCTION AND PACK-OUT DATA REQUIREMENTS, REPORTING AND ARCHIVAL

All set top box suppliers are required to generate and provide test and production data for the following reports.

All test and production data is to be archived by the supplier for a minimum of 5 years.

6.2.1 Pre-Production Reports. Issue reports of pre-production runs (LPP and LFP) to EchoStar. These reports should include but are not limited to:

6.2.1.1 Process Yield Reports

6.2.1.2 Production Reports

6.2.1.3 Design for Manufacturability suggestions for process improvements.

6.2.1.4 Description of any encountered process problems and what was done to solve the problems

6.2.1.5 Failure Analysis reports for any component or assembly failures.

6.2.2 Production Reports. Issue reports of their quality level to EchoStar quality on a weekly basis unless otherwise specified by EchoStar. The content and report format will be provided by EchoStar. These reports will include:

6.2.2.1 Process Yields

6.2.2.2 Sampling Audit Results

6.2.2.3 First Pass Yields

6.2.2.4 Top Five Failure Report by component and DPPM levels

6.2.2.5 Out-Of-Box (OBA) inspection and test reports. All suppliers are expected to have OBA processes functioning as part of their standard procedures. Contract Manufacturers are to report OBA results to EchoStar on a weekly basis. The report content may be dictated by EchoStar. Non-CM supplier may be directed to provide OBA reports depending upon business conditions.

6.2.3 Post-Production Reports. Issue reports of post-production returns (CRM) to EchoStar. These reports should include but are not limited to:

6.2.3.1 Process Yield Reports

6.2.3.2 Production Reports

6.2.3.3 Design for Manufacturability suggestions for process improvements.

6.2.3.4 Description of any encountered process problems and what was done to solve the problems

6.2.4 Third Party Receiving and Pack-Out Reports. Issue reports indicating the condition and status of incoming product that is to be packed out to EchoStar quality assurance on the requested reporting schedule. The content and report format will be provided by EchoStar. These reports will include:

6.2.4.1 Shipment Information

6.2.4.2 Data Files Properly Formatted and Received

6.2.4.3 Test Results

6.2.4.4 Failure Information (Content and Format Provided)

6.2.4.5 Pack-Out Quantities

6.2.4.6 RMA (Return Material Authorization) Information

- 6.2.5** Third Party Receiving and Pack-Out Communication. Pack-Out locations must develop and take ownership of a communication feedback loop to directly address receiver shipment issues with the receiver manufacturing company.

6.3 AVL (Approved Vendor List)

All set top box suppliers (CMs) or suppliers of any EchoStar designed assemblies are required to:

- 6.3.1** Build products using only EchoStar approved components from EchoStar approved suppliers.
- 6.3.2** Purchase approved components from approved suppliers in the quantities (splits) defined by EchoStar.
- 6.3.3** Contact EchoStar for instruction when approved components are not available from approved suppliers, for whatever reason, in a time frame that will allow forecast schedules to be met. In this condition EchoStar will provide, by deviation, instructions and conditions for using alternate components and/or alternate suppliers.

7.0 EchoStar Quality Procedures for Suppliers

7.1 Finished Goods Quality Standards

- 7.1.1** The quality standards for finished goods have been defined in EchoStar, document number 123473765-AA. This document defines the cosmetic acceptance criteria for EchoStar products and should be used on new products only.
- 7.1.2** EchoStar will provide acceptance criteria if reman or used materials are mandated for use in new product production by EchoStar.

7.2 Non-Conforming Product

7.2.1 New Product Specifications

Product is identified and segregated to prevent its inadvertent use and release. Documented procedures describe the criteria of non-conforming new product. Reference EchoStar document number 123473765-AA,

7.2.3 MRB Procedure

Non-conforming material may be returned to the supplier at the supplier's expense. The Material Review Board (MRB) dispositions all non-conformances found during receiving inspection and in-process inspection and the dispositions are maintained.

7.3 Quality Standards In-process

7.3.1 Receiving Inspection and Testing

EchoStar receives four categories of materials, each of which are inspected/tested in different manners:

7.3.1.1 Raw materials require inspection. Certain parts and accessories require receiving inspection, which is noted on the Oracle database and on the purchase order. Quality inspects and tests these parts, using documented procedures, and the parts are held in quarantine prior to release. Any part found to be non-conforming is identified and segregated until disposition is made. Quality maintains all inspection results.

7.3.1.2 New products and parts not requiring inspection are identified in the Oracle database and on the purchase order, and when received by EchoStar go directly to the warehouse. They are not inspected and/or tested until part of the final pack-out process (refer 7.3.2).

7.3.2 In-process Inspection and Testing/Final Inspection and Testing

Quality performs in-process inspection and testing, also considered final inspection and testing, on the pack-out line using documented procedures. The results of all inspections and tests are recorded and maintained by Quality. In addition, the pack-out line weighs each packed box as a check for missing components. All non-conforming products are identified and segregated. Non-conforming units are held until the non-conformance is corrected or dispositioned. All other product that is being packed out is normally released unless otherwise directed by Quality.

7.3.3 Supplier AQL Levels

AQL sampling by the supplier will meet or exceed those set forth from the following order:

1. AQL document #124214
2. EchoStar Engineering specifications. (Special occurrence).
3. EchoStar QA request --per sampling as found through EchoStar or supplier rejection rates.

7.4 Corrective Action Requests (CARs) and Failure Analysis (FAs)

All suppliers are responsible for implementing corrective action when non-conformance occurs.

7.4.1 CARs *Reference document 142605*

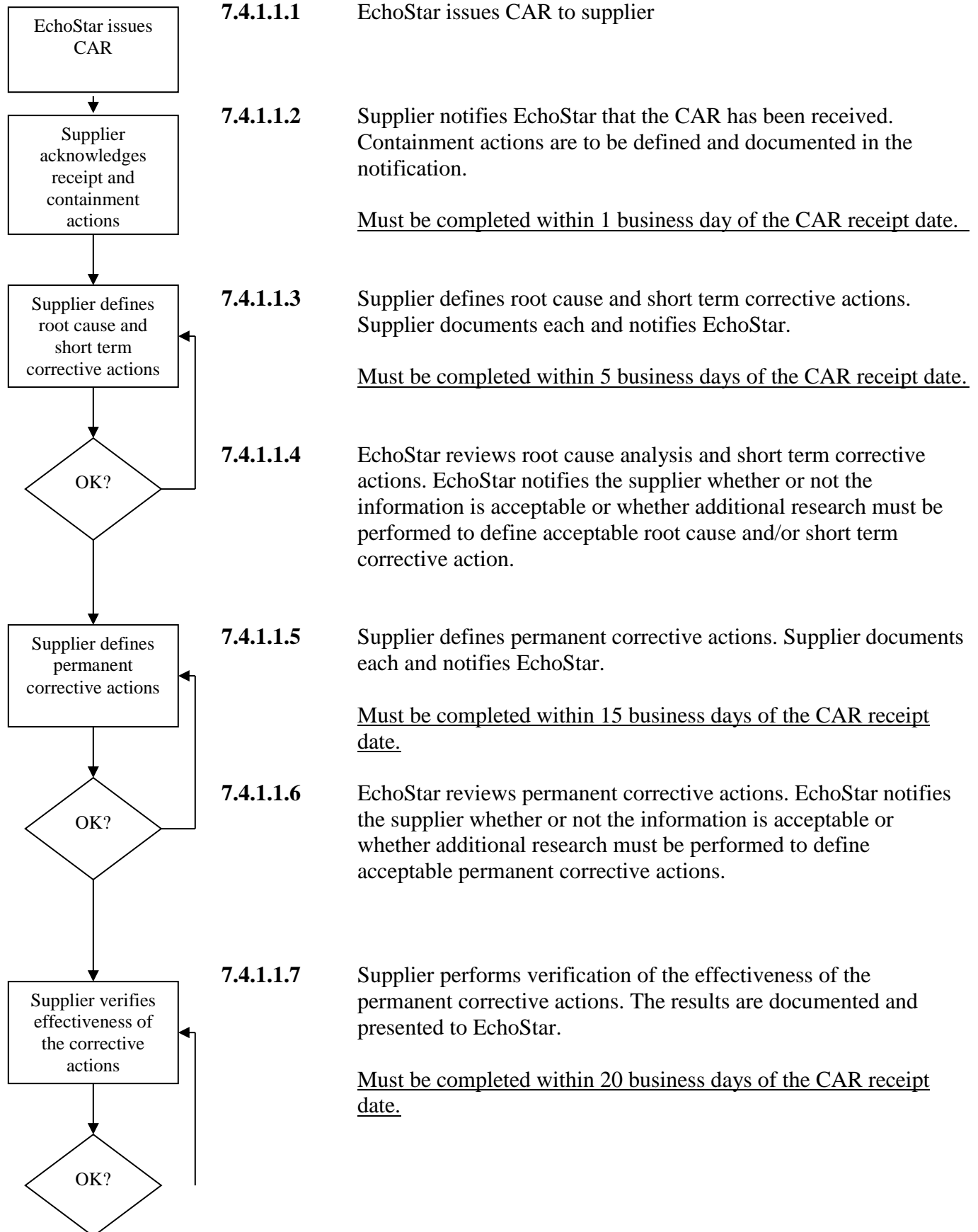
EchoStar will issue CARs to suppliers when issues or non-conformances are identified relative to the quality of products, services or business practices.

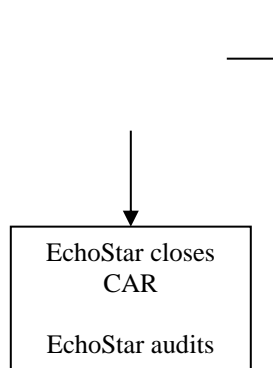
It is the responsibility of the supplier to implement formal corrective actions relative to the issue(s) or non-conformance(s) and to report all related activities to EchoStar.

EchoStar will determine the acceptability of the corrective actions as they pertain to permanent issue(s) or non-conformance(s) resolution.

The following process and guidelines are to be followed:

7.4.1.1 Process.





7.4.1.1.8 EchoStar reviews the verification data. EchoStar notifies the supplier whether or not the information is acceptable or whether additional work must be performed to define and implement acceptable permanent corrective actions.

7.4.1.1.9 EchoStar closes the CAR
EchoStar will perform random CAR implementation audits after the CAR closure date. This may occur over the life of the product or process. If issues are found, the CAR will be re-opened.

7.4.2.1 Requirements.

- 7.4.2.1.1** All formal CAR communications must be in written format
- 7.4.2.1.2** Supplier Plant Manager must sign-off on all documented CAR responses from the supplier to EchoStar.
- 7.4.2.1.3** Escalation Path. Each CAR response sent to EchoStar from the supplier that is considered unacceptable, will be reported to incrementing higher levels of management within the supplier organization as follows:
 - 7.4.2.1.3.1** CAR Recipient and Quality
 - 7.4.2.1.3.2** Same as above plus the Plant Manager.
 - 7.4.2.1.3.3** Same as above plus the Regional VP.
 - 7.4.2.1.3.4** Same as above plus the Company President.

7.4.3 FAs

FAs, whether formal or informal, are to be established and implemented in a “closed loop” fashion, following these guidelines:

- Identify the failure.
- Determine whether the failure was related to internal workmanship or to the component/assembly itself. If it is related to the component/assembly.
- Send sample parts to the component/assembly vendor requesting failure analysis.
- Monitor the vendors progress.
- Record and Report results to EchoStar Quality on a monthly basis.

7.5 Supplier Audit Document

EchoStar will conduct audits of suppliers and contract manufacturers on an as-needed basis. This may include new factory approval or re-audits performed to re-verify factory acceptance. These audits will cover all aspects of quality and production to ensure compliance with EchoStar requirements. The supplier will be required to correct any problems and prevent reoccurrence.

7.6 Packaging

Proper handling, storing, packaging and delivery are crucial to preventing product damage. Precautionary measures must be taken to prevent product from being damaged beginning at manufacturing and continuing through customer delivery. Procedures and engineering specifications

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define the methods for the handling, storage, packing, preservation, and delivery of raw materials and finished goods to prevent damage. The quality standards for packaging raw materials and finished goods are defined in EchoStar document numbers 207457 and 120313.

EchoStar expects suppliers to ship only conforming products; therefore, general Certificates of Compliance are not formally required.

7.7 **Pallet Specifications**

All pallet types/sizes must meet the criteria stated within document #120313.

7.8 **First Articles**

Quality specifications define the methods for first article submission, inspection and approval/rejection. The quality standards for first articles have been defined in EchoStar document number 104791. Submission of a first article will be required for all new components. EchoStar Quality requires first article reports and submission of first article for the following:

- 7.8.1 New or Modified Tooling
- 7.8.2 Process Change or change of Production Facility location
- 7.8.3 Materials Change

7.9 **Supplier Scorecards**

EchoStar will generate and maintain a Supplier Scorecard for Contract Manufacturers, Repair Operations and Pack-out Facilities of top assembly set top boxes.

Scorecards for other critical top assembly products like remotes, switches, HDDs and LNBFs may also be generated.

7.9.1 **Distribution**

- 7.9.1.1 Quality Scorecards will be distributed by EchoStar QA. The frequency of distribution will be determined by EchoStar Operations Management.
- 7.9.1.2 Contract Manufacturers can contact EchoStar QA to request a copy of their scorecard.

7.9.2 **Scorecard Criteria**

The specific criteria or data elements that comprise a scorecard may be modified by EchoStar at any time due to business needs.

As a baseline, Quality scorecards will be generated based upon the following elements:

- 7.9.2.1 **Production Reports.** Submittal of production report as defined by EchoStar QA. On-time submittal and accuracy of the report are criteria for scoring.
- 7.9.2.2 **OBA Reports.** Submittal of OBA reports as defined by EchoStar QA. On time submittal and accuracy of the report are criteria for scoring. On-site OBA audits as performed by EchoStar may also be included in scoring criteria.

7.9.2.3 **Corrective Actions (CARs).** The number of CARs issued by EchoStar to the Contract Manufacturer.

7.9.2.4 **DPPM, DPMO and Standard Deviation** Refer to section 6.2. As defined within the EchoStar production reporting; DPPMs, DPMOs and Standard deviations will be used as a scoring criteria as they reflect process stability and continuous process improvement.

7.9.2.5 **Definitions:**

7.9.2.5.1 ICT = In-Circuit Test

7.9.2.5.2 FCT = Functional Circuit Test

7.9.2.5.3 FUT = Functional Unit Test

7.9.2.5.4 LPP = Limited Pre-Production build.

7.9.2.5.5 MP = Mass Production

7.9.2.5.6 CM = Contract Manufacturer

7.9.2.5.7 DPPM = Defective Parts Per Million

7.9.2.5.8 DPMO = Defects Per Manufacturing Opportunity

7.9.2.5.9 OBA = Out of Box Audit