



*Member of the FM Global Group*

# **Approval Standard for Repair Service for Communication Equipment Used in Hazardous (Classified) Locations**

**Class Number 3605**

**December 1994**

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# Foreword

The FM Approvals certification mark is intended to verify that the products and services described will meet FM Approvals' stated conditions of performance, safety and quality useful to the ends of property conservation. The purpose of Approval Standards is to present the criteria for FM Approval of various types of products and services, as guidance for FM Approvals personnel, manufacturers, users and authorities having jurisdiction.

Products submitted for certification by FM Approvals shall demonstrate that they meet the intent of the Approval Standard, and that quality control in manufacturing shall ensure a consistently uniform and reliable product. Approval Standards strive to be performance-oriented. They are intended to facilitate technological development.

For examining equipment, materials and services, Approval Standards:

- a) must be useful to the ends of property conservation by preventing, limiting or not causing damage under the conditions stated by the Approval listing; and
- b) must be readily identifiable.

Continuance of Approval and listing depends on compliance with the Approval Agreement, satisfactory performance in the field, on successful re-examinations of equipment, materials, and services as appropriate, and on periodic follow-up audits of the manufacturing facility.

FM Approvals LLC reserves the right in its sole judgment to change or revise its standards, criteria, methods, or procedures.

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## HOW TO APPLY FOR REPAIR SERVICE APPROVAL

Send a letter requesting an audit addressed to:

Electrical Group Manager  
FM Approvals  
1151 Boston-Providence Turnpike  
Norwood, Massachusetts 02062

The letter should indicate the following:

- a. The location of the repair service facility to be audited.
- b. The specific manufacturer(s) of FM Approved communication equipment that you are seeking to repair at the facility to be audited.
- c. The type/model/series of products to be repaired at this facility.
- d. A detailed summary of the specific requirements as listed in Section 4 of this standard.

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## 1. INTRODUCTION

### 1.1 Purpose

This standard serves as the basis for FM Approval of independently owned facilities that repair FM Approved communication equipment for hazardous (classified) locations.

### 1.2 Scope

This standard does not apply:

- when modifications are made to the equipment;
- when an FM Approval label is applied to equipment not shipped from the original manufacturer as FM Approved;
- to repairs made by facilities owned by the original manufacturer.

The manufacturer's repair facilities are covered by the Approval Agreement for the listed product. That Agreement requires the manufacturer to provide adequate facilities for repair of the listed product.

Items not considered as repairs are those in which an action is performed on a unit which does not require the outer casing of the unit to be opened in a manner which exposes the internal electrical circuits of the unit. The following is a partial list of examples which are not considered to be repairs:

- replacement of an antenna,
- changing an external accessory,
- changing/replacement of a battery pack,
- software loaded into the unit,
- a control knob,
- escutcheon, or,
- belt clip.

### 1.3 Basis for FM Approval

FM Approval is based on satisfactory evaluation of the repair service facilities and procedures.

### 1.4 Basis for Continued Approval

Continued Approval is based upon:

- the use of acceptable quality control procedures;
- satisfactory field experience;
- compliance with the terms stipulated in the Approval Agreement, and
- periodic re-examination and audit inspection to evaluate continued conformity to requirements originally evaluated.

### 1.5 Basis for Requirements

The requirements of this standard are based on experience, and/or the standards of other organizations. The advice of manufacturers, users, and trade associations was also considered.

The requirements of this standard are intended primarily as guides, and strict conformity is not always mandatory. Repair facilities having procedures not covered by this standard may be Approved if performance equal or superior to that required by this standard is demonstrated, or if the intent of the standard is met. Alternatively, repair facilities which do meet all the requirements identified in this standard may not be Approved if other conditions which adversely affect the repair of the Approved product exist or if the intent of this standard is not met.

### 1.6 Effective Date

The effective date of an Approval Standard mandates that all Approvals after the effective date shall satisfy the requirements of that standard. The effective date shall apply to the entire Approval Standard.

The effective date of this standard is the publication date.

## 2. APPLICATION

This standard shall apply to the repair of communication equipment FM Approved under the following categories:

- a. Intrinsically safe for Class 1, 11 or 111, Division 1, Groups A, B, C, D, E, F and G, and/or
- b. Nonincendive for Class 1, Division 2, Groups A, B, C and D, and/or c. Suitable for Class 11, Division 2, Groups F and G, and/or, d. Suitable for Class 111, Division 1 and 2.

This standard is intended to be used in conjunction with repair of communication equipment which is FM Approved to one or all of the following FM Approval Standards:

<i>Title</i>	<i>Class No.</i>	<i>Issue Date</i>
Electrical Equipment for Use in Hazardous (Classified) Locations – General Requirements	3600	March 1989
Intrinsically Safe Apparatus and Associated Apparatus for Use in Class 1, 11 and III, Division 1, Hazardous (Classified) Locations	3610	October 1988
Electrical Equipment for Use in Class 1, Division 2; Class 11, Division 2; and Class 111, Division 1 and 2 Hazardous Locations	3611	April 1986

### 3. DEFINITIONS

For purposes of this standard, the following terms apply:

#### 3.1 Independently Owned Facility

A facility that is owned and operated by other than the specific manufacturer of the Approved product being repaired.

#### 3.2 Modification

A modification constitutes something done internally to the unit that changes it from the configuration as shipped from the original manufacturer.

#### 3.3 Original Manufacturer

The manufacturer of the product under repair to whom the FM Approval was originally issued.

#### 3.4 Repair

A repair constitutes something done internally to the unit that would bring it back to Its original condition Approved by FM Approvals.

### 4. REQUIREMENTS

#### 4.1 Parts Procurement

##### 4.1.1 Requirement

The repair facility shall have a method by which original manufacturer's parts, or parts specifically listed by FM Approvals can be obtained.

4.1.2 Procurement of parts shall be documented to include, as a minimum, purchase order history and verification of receipt and stocking via the part number. Verification shall be made by audit of applicable documents.

#### 4.2 Documentation

##### 4.2.1 Requirement

The repair facility shall have a method by which original manufacturer's documentation, subsequent revisions and bulletins can be obtained.

#### 4.2.2 Verification

Documentation shall consist of, but not limited to, schematics, assembly drawings, parts lists, inspection and test procedures, and service manuals. Verification shall be by inspection of applicable documents during audit.

### 4.3 Training

#### 4.3.1 Requirement

The repair facility shall have a method by which the persons doing the repair are properly trained. This training shall encompass original manufacturer's workmanship standards and unique areas within the product under repair that may be critical to the Approval rating.

#### 4.3.2 Verification

Manufacturer's technical training attendance or other evidence of technical qualification shall be verified by audit.

### 4.4 Traceability and Marking

#### 4.4.1 Requirement

The repair facility shall have a method of tracing the equipment that was repaired by that facility.

#### 4.4.2 Verification

The method can be in the form of a paper trail including placing a unique mark on the equipment. If the repaired equipment is marked, the marking shall not affect the original manufacturer's marking. The marking shall not be applied by mechanical means, such as drive screws, that would damage the housing. Label adhesion to the equipment enclosure material, shall not degrade due to exposure to chemicals of the Group(s) for which the equipment is rated. Conformance shall be verified by audit.

### 4.5 Identifying and Segregating

#### 4.5.1 Requirement

The repair facility shall identify and segregate FM Approved products from non-FM Approved products so that Approved products will be serviced with appropriate materials.

#### 4.5.2 Verification

Materials used in the repair of the FM Approved product shall be identified and segregated. Areas shall be controlled as to prevent inadvertent usage of inappropriate materials. If movement to a controlled area is impractical due to size or configuration, the materials for repairing FM Approved products shall be conspicuously marked or tagged.

## 4.6 Inspection and Tests

### 4.6.1 Requirement

The repair facility shall have a method of inspecting and testing the product after the repair to verify conformity to the original manufacturer's specifications.

### 4.6.2 Verification

Documentation shall be kept to demonstrate that operations have indeed been completed as evidenced, for example, by inspection stamps or signature.

## 4.7 Calibration

### 4.7.1 Requirements

- a. The repair facility shall have in place an appropriate system for the calibration of all equipment used in the repair of FM Approved equipment.
- b. Measuring and test equipment shall be calibrated by the means indicated below.
- c. The repair facility shall require that the providers of calibration services document their capabilities to perform these services.

### 4.7.2 Verification

- a. The calibration system should provide for test and measuring equipment accuracy by the timely detection and correction of deficiencies. Procedures shall be verified by reference to the quality manual governing the repair service.
- b. Calibration may be the manufacturer or a commercial facility utilizing standards whose calibration is certified as being traceable to national standards; or have been derived from acceptable values of natural physical constants; or have been derived by the ratio type of self-calibration techniques; or are based upon national standards. In countries whose standards are compared, at planned intervals, with international or U.S. National standards. Verification shall be made by reference to the certificates on file for applicable equipment.
- c. Test equipment records for providers of calibration services shall include reports or certificates of calibration for each item of measuring and test equipment and for each standard. They should provide a description or identification of the item, calibration interval, date of last calibration, and calibration results or out-of-tolerance conditions. These records shall be available for review by FM Approvals.

## 4.8 Relabeling

### 4.8.1 Requirement

- a. The repair facility shall have a method by which the replacement of FM Approval labels are controlled to ensure that any relabeling is limited to units that were originally shipped from the Manufacturer with an FM Approval label in place.
- b. FM Approval labels shall not be stocked by the repair facility. An FM Approval label shall be ordered from the original manufacturer as needed to repair a specific unit as verified below.

#### 4.8.2 Verification

Replacement labels may be obtained and applied by the repair facility providing satisfactory evidence that the unit being relabeled was originally an FM Approved unit. Verification may include, but is not limited to:

- unit with a damaged Approval label
- a unit with a defective housing displaying an Approval label.
- a customer invoice indicating the serial number of the unit and purchase of an FM Approved model.
- service center records showing that the unit previously had an Approval label.
- factory confirmation showing that the unit, identified by serial number, shipped as an FM Approved product.

## 5. OPERATIONS REQUIREMENTS

### 5.1 Demonstrated Quality Control Program

An inspection of the repair facility shall be part of the Approval. Its purpose shall be to determine that equipment, procedures, and quality controls are properly maintained to repair a product to the same condition as it was originally manufactured and Approved.

### 5.2 Facilities and Procedures Audit

Unannounced follow-up Inspections shall be conducted to assure continued quality control and uniformity in the repair of the Approved product.