The Texas HTM Field Manual

Statewide biomedical service, NFPA 99 electrical safety, and the discipline of inspection-ready equipment

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This e-book is editorial and educational commentary published by Texas Biomedical Services in July 2026. It summarizes publicly reported standards and regulatory developments as an aid to healthcare-technology-management (HTM) and clinical-engineering professionals; it is not legal, clinical, or compliance advice, and it does not replace primary standards, manufacturer service manuals, the Texas Department of State Health Services rules, or the judgment of a qualified biomedical engineering professional. Regulatory requirements change; always verify against the current edition of any cited code. No statement here should be read as a guarantee of accreditation outcome or clinical result.

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Foreword

Texas is not one service territory; it is eight metros and a thousand miles of highway between them. A biomedical program that works in the Texas Medical Center in Houston has to also work in a rural clinic outside McAllen, in a Dallas health system, and in an Austin surgical suite — often on the same week. That geography is the first fact of doing HTM work here, and it shapes everything that follows.

This field manual was written for the people who keep Texas hospitals running: the biomedical equipment technicians, clinical engineers, facilities directors, and the OEMs who outsource their field service to a partner on the ground. It is grounded in the standards and regulatory landscape in force as of July 2026, and it is deliberately checklist-driven. Read it once end to end, then keep it on the bench and photocopy the checklists.

Our bias throughout is toward the boring, provable, repeatable work that never makes a headline — because in this trade, a quiet day is a successful one.

Chapter 1 — The Distance Problem: Serving Texas at Scale

The single biggest operational challenge in Texas biomedical service is not technical difficulty; it is drive time. Houston, Dallas, San Antonio, Austin, Fort Worth, El Paso, McAllen, and Corpus Christi are all real markets with real hospitals, and no two of them are close together. El Paso is nearer to three other state capitals than it is to Houston. A statewide program that treats Texas as one uniform coverage area will fail the facilities that are farthest from its home base.

The answer is not heroics; it is architecture. Coverage has to be designed — regional technician placement, a parts strategy that anticipates the failures common to each region's equipment mix, and a dispatch model that promises a response time it can actually keep. A facility in South Texas does not need a technician who is theoretically available in Houston; it needs one who can be on-site inside a defined window, with the right part on the truck.

The grid itself is part of the picture. ERCOT operates Texas as its own interconnection, and summer demand volatility is a recurring reality. Equipment programs that account for power quality, backup power readiness, and heat-driven load are programs that plan for Texas as it actually is, not as a map without weather.

Statewide service is a promise about time and distance. Make the promise specific, and build the coverage that keeps it.

Field Checklist

- ■ Map coverage and realistic response windows by metro and region
- ■ Place parts inventory to match each region's equipment mix
- ■ Plan for ERCOT grid volatility and heat-driven load

Chapter 2 — Every Modality, One Program

A hospital does not buy biomedical service one device at a time; it buys a program that can touch everything in the building. That means the full inventory — biomedical patient-care equipment, medical imaging, and scientific laboratory instruments — under one accountable partner. The value of a single program is not just convenience; it is a unified maintenance history, one documentation standard, and one point of accountability when a surveyor asks who is responsible for a given asset.

Modality breadth is a discipline. Infusion pumps, defibrillators, and physiological monitors demand different competencies than CT, X-ray, and ultrasound, which in turn differ from centrifuges, analyzers, and lab refrigeration. A program that claims to cover all of it has to prove competence across all of it — through factory training, through documented procedures, and through the QA data that shows each modality was returned to specification, not merely powered back on.

The temptation, especially for a growing service organization, is to overpromise breadth and under-deliver on the harder modalities. Resist it. It is better to be honest about what you cover directly and what you subcontract or escalate than to leave a hospital believing its imaging suite is covered when it is not.

One inventory, one standard, one accountable partner. That is what "full-modality" has to mean in practice.

Field Checklist

- ■ Maintain a single documented standard across all modalities
- ■ Verify factory training and competence for each modality claimed
- ■ Be explicit about what is serviced directly vs. escalated

Chapter 3 — NFPA 99 and Isolated Power in the Lone Star State

NFPA 99, the Health Care Facilities Code, is the backbone of electrical safety in hospitals, and it moves on a multi-year revision cycle. The 2024 edition is current, and the 2027 edition is now in development. A subtlety worth keeping straight: CMS still references the 2012 edition of NFPA 99 in its Conditions of Participation, so newer editions (2018, 2021, 2024) exist but are not uniformly incorporated into federal rulemaking. The practical posture for a Texas facility is to align with the most current adopted requirements while preparing for the tightening the newer editions signal.

Isolated power systems and line isolation monitors (LIMs) are where this gets concrete. Wet procedure locations — operating rooms and other spaces where fluids and electricity meet — rely on isolated power to limit the consequences of a first fault. Annual testing of isolated power panels and LIMs is not optional, and the results have to be documented in a form a surveyor can read. Recent NFPA 99 revisions have also tightened expectations around medical gas systems, including carbon monoxide detection for medical air, and around the organization of survey-ready records.

For biomedical and facilities programs in Houston, Dallas, Austin, and San Antonio alike, the work is the same: test on schedule, to the standard, and prove it.

Field Checklist

- ■ Perform annual NFPA 99 isolated power and LIM testing
- ■ Align practices with the current adopted edition and track the 2027 cycle
- ■ Document electrical safety results in survey-ready form

Chapter 4 — Preventive Maintenance That Survives a Survey

Preventive maintenance is the least glamorous and most valuable work in the building. A good PM program does not merely keep equipment running; it produces the evidence trail that proves the equipment was maintained on schedule, to manufacturer specification, by a competent technician. When a surveyor walks the floor, the PM sticker that is current and the record that backs it are the difference between a clean finding and a citation.

The core of a durable PM program is a maintenance strategy that is defensible. Manufacturer-recommended intervals are the default; any deviation into an alternative equipment maintenance (AEM) approach has to be justified, documented, and defensible on risk grounds. The program has to be complete — every asset accounted for — and current, because a PM completion rate that slips below expectations is one of the fastest ways to attract regulatory attention.

Custom PM programs beat generic ones. A hospital's equipment mix, patient population, and utilization patterns should shape the schedule. A device that runs continuously in a busy Houston ICU is not on the same clock as an identical unit used occasionally in a rural clinic.

Build the PM program so that its own records are its best defense. Complete, current, documented.

Field Checklist

- ■ Account for every asset in a complete PM inventory
- ■ Justify and document any AEM deviation from manufacturer intervals
- ■ Keep PM completion current and defensible

Chapter 5 — Calibration and Proof of Specification

Returning a device to service means proving it meets specification — not that it turned on and looked fine. Calibration to the applicable standard, with documented before-and-after results, is what separates biomedical engineering from guesswork. It is also what protects the patient, the facility, and the service organization when a device's accuracy is ever questioned.

The proof-of-spec discipline applies across the inventory. A physiological monitor that reads a few percent off, an infusion pump that delivers slightly outside tolerance, an imaging system with drifted parameters — each is a clinical risk that calibration is designed to catch and correct. The record of that calibration, traceable and retained, is the asset that outlives the service visit.

Traceability matters. Calibration performed with test equipment that is itself in-calibration, against a recognized standard, produces results a surveyor and a clinician can both trust. Calibration performed with uncertain tools produces numbers nobody should rely on.

Every return-to-service should carry the data that proves it. Measure, adjust, document, retain.

Field Checklist

- ■ Calibrate to the applicable standard with traceable test equipment
- ■ Record before-and-after results for every calibration
- ■ Retain proof-of-spec records with the asset history

Chapter 6 — Manufacturer Field Service and In-Service Education

Not every service relationship is with a hospital. OEMs increasingly outsource field service — installation, repair, calibration, PM, and in-service education — to a partner with boots on the ground in the target market. For a manufacturer that does not maintain its own Texas field force, a capable local partner delivering service under the OEM's brand is the difference between a product that is well-supported statewide and one that is not.

This work carries its own discipline. Delivering field service on behalf of an OEM means representing that manufacturer's standards, using its documented procedures, and reporting back in a form the OEM's quality system can absorb. It is a service business built on trust and consistency: the hospital experiences the OEM's brand, and the OEM experiences a partner who protects it.

In-service education is the quiet multiplier. When clinical and biomedical staff understand how to operate and care for equipment correctly, service call volume drops, equipment lasts longer, and safety improves. Operator training and electrical safety in-services are not overhead; they are prevention delivered in a classroom instead of at 2 a.m. on a service call.

Represent the brand, follow the procedures, and teach the staff. Outsourced field service done right is invisible — the hospital just sees equipment that works.

Field Checklist

- ■ Deliver OEM field service to the manufacturer's documented standard
- ■ Report back in a form the OEM's quality system can absorb
- ■ Provide operator and electrical-safety in-service education

Chapter 7 — Documentation the Surveyor Trusts

Documentation is not the afterthought of biomedical service; it is the deliverable. The repair happened, but if it is not recorded, it did not happen as far as a surveyor is concerned. Survey-ready records aligned with Joint Commission, NFPA 99, and FDA-SMDA requirements are what a facility hands across the table when accreditation is on the line — and their quality reflects directly on the service program that produced them.

Good documentation is organized, complete, and retrievable. When a surveyor asks for the maintenance history of a specific asset, the record should be findable in minutes, not excavated over an afternoon. The FDA Safe Medical Devices Act framework adds device-reporting obligations that a serious program tracks and honors. And the trend across the 2026 regulatory landscape is unmistakable: regulators want to see the outcome and the evidence, not merely a binder that exists.

Documentation is also a competitive asset. The service organization whose records make a hospital's survey easier is the organization that keeps the account. In HTM, the paperwork is the product's proof.

Record everything, organize it for retrieval, and align it to the standard. The best-documented program wins the survey and the renewal.

Field Checklist

- ■ Align records to Joint Commission, NFPA 99, and FDA-SMDA requirements
- ■ Make asset maintenance history retrievable in minutes
- ■ Track and honor device-reporting obligations

Conclusion: The Reliable Texan

The best biomedical programs in Texas are the ones nobody talks about, because nothing goes wrong. The scanner is up when the schedule needs it. The isolated power panel passes its

annual test. The PM stickers are current when the surveyor walks the floor. The imaging suite in San Antonio and the monitors in a McAllen clinic are held to the same documented standard, by a partner who can actually get there.

That reliability is not luck. It is coverage designed around the real distances of Texas, competence proved across every modality, testing done on schedule to NFPA 99, calibration that proves specification, and documentation a surveyor trusts. The 2026 regulatory landscape — the NFPA 99 cycle, CMS's continued scrutiny, Joint Commission's expectations — is converging on a single demand: show us the outcome and the evidence.

Build the boring, reliable machine. Cover the distance. Document relentlessly. In a state this big, being the partner that always shows up and always proves it is the whole competitive advantage.

References

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