



REGULATORY COMPLIANCE COMPREHENSIVE MAINTENANCE ASSE 6040 CERTIFIED TECHNICIANS



Inspections. Verifications. Repairs. Environmental Monitoring. Consulting.

FS Medical Technology (FSMT)

Largest Medical Gas Inspection Company in the WEST

We are medical gas experts available to provide the entire range of required medical gas services. With 30+ years of healthcare experience, 30+ employees, and 300 hospital clients, you can be confident we can assist you in meeting all medical gas standards for the Environment of Care.

Our clients expect FSMT to provide quick, efficient solutions. So, the entire FSMT team is trained, proficient, and credentialed. Not only is each field service technician qualified to inspect, maintain, and repair the array of medical gas equipment, our customer service and administrative staff also have detailed knowledge of our clients' facilities and medical gas systems.

Our range of services and solutions:

- ✓ Comprehensive Medical Gas System Repairs
- ✓ ASSE 6040 Training for Hospital Engineers (Meeting all Regulatory Requirements)
- ✓ Articulating Boom Inspections (Including Internal Parts and Mechanical Operation)
- ✓ Emergency Oxygen Supply Connection Function Testing
- ✓ Waste Anesthetic Gas Testing (WAGD), (Meeting NIOSH Requirements)
- ✓ Industry Leading Reports/Documentation (Full-Color with Graphics, Available in the Cloud)
- ✓ Six (6) ASSE 6030 Verifiers, Four (4) ASSE 6050 Instructors, Fifteen (15) ASSE 6040 Med Gas Specialists
- ✓ Construction Verifications and Medical Gas System Back-Feed Management
- ✓ Engineering Consulting: Pipe System Tracing, Riser Diagrams, Signage, Peak Demand Studies for Equipment Sizing, Pre-Construction System Design, Project Management



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Medical Gas Services

A Comprehensive Approach with MedGasSafe

FSMT brings a highly qualified team of verifiers and technicians to West Coast facilities.

Exceptional customer service is our priority. For 30+ years, FSMT has provided medical gas maintenance services to a wide range of medical facilities, laboratories, and industry.

Scope of Services with MedGasSafe

Certifications – New Construction and Renovation

FSMT's verifiers, credentialed by NITC ASSE 6030 standards, ensure that your medical gas pipeline and source systems are compliant with NFPA 99 standards. Efficiencies noted during inspections are accompanied by detailed recommendations for corrective action. The testing results are provided by paperless reporting delivered post-construction.

Annual Inspections – Testing and Recertification

Medical gas inspections are performed by FSMT's NITC certified ASSE 6020 and 6040 technicians. All aspects of the medical gas systems are evaluated including source equipment, alarms, valves, and outlets. The MedGas Safe report advises facilities of any problem in the medical gas system – including deficiencies or outdated equipment. Possible upgrades are noted to save money and modernize a facility.

Installation – Low Voltage Wiring

FSMT technicians provide installation services connecting master and area alarm panels. Connections to facility BMS systems

are coordinated. Wiring is landed correctly and panels are programmed to identify all signals.

Environmental – Monitoring and Analysis

FSMT's environmental studies ensure that facility staff are safe from toxic gases and fumes. Employee exposure limited to hazardous chemicals are examined. Room air change rates for isolation rooms and waste anesthetic gas disposal systems are evaluated.

Design Services – Turn-Key Packages for all Types of Medical Gas Systems

FSMT provides facility owners turn-key medical gas design packages, including engineered drawings and installations.

Maintenance – Comprehensive Scheduled and Unplanned Call-Outs

Both planned and unplanned maintenance services ensure that medical gas equipment is maintained to manufacturer recommendations and industry best practices. FSMT ASSE 6040 technicians keep life safety equipment working smoothly, improving reliability and reducing downtime.

- ✓ **Certifications**
New Construction and Renovation
- ✓ **Annual Inspections**
Testing and Recertification
- ✓ **Installation**
Low Voltage Wiring
- ✓ **Environmental**
Monitoring and Analysis
- ✓ **Design Services**
Turn-Key Packages
- ✓ **Maintenance**
Comprehensive

Surgical Booms

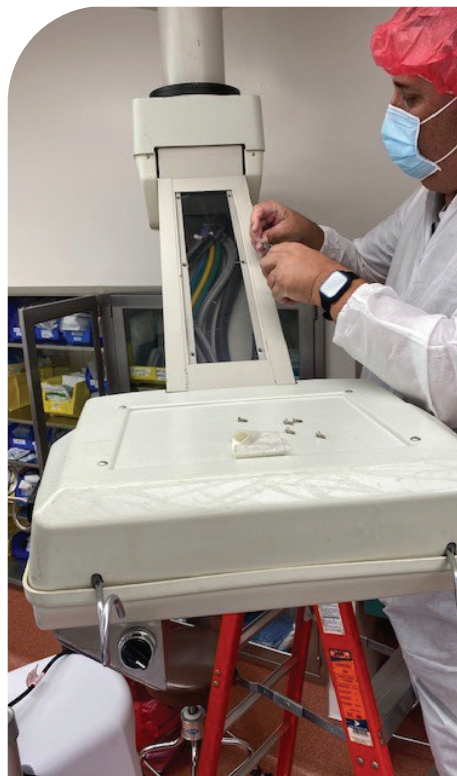
Are your surgical boom inspections compliant?

NFPA 99.5.1.14.4.3.1 requires that all articulating devices undergo inspection at least every 18 months. Inspection includes oxidizer leak detection (O₂ and N₂O) which eliminates possible fire hazard.

Function test of boom operation identifies worker safety issues due to brake failure. Visual inspection determines potential hose condition issues leading to lowered flow rates and hose deterioration.

Hospital surgery fires caused by oxidizer leaks within articulating devices (boom and columns) have been identified by NFPA 99 as a cause for concern at facilities nationwide. Gas leakage coupled with heat source (electrical outlet) and fuel (dust bunnies) adds up to the typical "fire triangle" condition.

FSMT opens booms/columns to visually inspect all gas hoses and fittings – determine hose condition and identify leakage. Some companies only inspect the articulating device exterior – not FSMT. FSMT technicians access device interiors to ensure complete leakage determination. All interior spaces are cleaned of debris and mechanical components are inspected/tested.



Additional Medical Gas Maintenance Services

Keep your equipment performing per manufacturer recommendations.

Time-Based and Usage-Based Preventive Maintenance

Performing manufacturer recommended maintenance (PM) helps prevent unexpected machine failures. This maintenance strategy replaces the “Run-to-Failure” practice. Unplanned, reactive maintenance is always more expensive, disruptive, and potentially catastrophic.

Adding Predictive Maintenance (PdM) expands the manufacturer PM to include machine diagnostics of oil analysis and heat signature measurements. The best preventive maintenance service incorporates both time-based and usage-based metrics. Time-based services (PM) to ensure compliance with manufacturer standards. Usage-based maintenance is triggered by the number of hours, cycles, or results of PdM diagnostics.



Effective PM programs for medical gas equipment are not the same as standard industrial PMs. It is not just the machines that need to be serviced, but careful inspection and testing of all alarms and signals is required. Determining the PM and PdM needs of healthcare facilities is best done with the help of medical gas maintenance professionals.

FSMT uses condition monitoring (PdM) to reduce PM frequency without sacrificing reliability. It is possible to conduct maintenance too often! A thoughtfully planned program relying on both the manufacturer’s recommendations and the unique facility environment is the most cost effective and reliable method.

Preventive maintenance services are provided for all types of medical gas equipment.



Source Equipment:

- Vacuum pumps
- Medical air compressors
- Medical air dryers
- Manifolds

Pipeline Equipment:

- Master alarm panels
- Area alarm panels
- Station inlets/outlets
- Corrosion
- Filtration

5 Elements of our Maintenance Success:

1. Updating any existing PM programs
2. Create a timely and modern PM plan
3. Computer Maintenance Management Software
4. Performance data from your assets
5. 7 Basic PM elements: Testing, Servicing, Calibration, Inspection, Adjustment, Alignment, Installation

Facility Training: ASSE 6040

QuickStudy 6040 - Alternative

Medical Gas Maintenance Technician - Updated to NFPA 99 2021 edition.
A 4-hour in-person on-site introduction self-paced online E-learning course.

NFPA 99 code requires any engineer conducting maintenance service or repairing medical gas equipment be appropriately trained. This requirement can be satisfied in one of two ways:

1. Successful completion of the 32-hour ASSE-6040 classroom curriculum developed by the American Society of Sanitary Engineers (ASSE). The course is heavily weighted toward the NFPA code requirements and covers all levels of medical gas systems including dental locations and hyperbaric units (Category III). Regulators recognize the NITC testing organization as the leader for medical gas service certifications.
2. The second option is certification by the facility that each engineer working on medical gas equipment has completed a training course specific to the equipment at that facility.

FSMT QuickStudy is a unique approach that solves three key issues for facilities:

1. Reduced cost with no travel or hotel expense.
2. The curriculum is geared to the facility specific equipment.
3. It is a certificate that is only valid for the specific facility.

Certificate and ID Card

FSMT issues each student a certificate of completion and ID card. Facility management receives supporting documentation certifying the course content and instructors' credentials.

The training hours of **QuickStudy** can be applied toward meeting the requirements of the ASSE 6040 certificate through NITC.

Course Outline

Introduction to Medical Gas.

Classroom Learning

4 hours On-site Group Session

1. Medical gas definitions
2. General physics of gases
3. Overview of online e-learning modules
4. 'Tips for Success'
5. Class walk-through of facility equipment

Online Study Modules.

Self-Directed

7 hours E-Learning Course

1. Product performance knowledge.
Part 1: oxygen, medical air, vacuum
2. Product performance knowledge.
Part 2: nitrous oxide, pipeline components
3. Product maintenance knowledge.
Part 1: maintenance issues
4. Product maintenance knowledge.
Part 2: hazards to patients
5. Testing and tools: maintenance schedule, parts, equipment
6. Final exam: minimum passing score 70%



FSMT ASSE 6050 Instructors

Medical Gas Resiliency

What is medical gas resiliency? Why should it be important to you?

When the COVID pandemic hit United States hospitals in 2020, hospitals saw an influx of patients requiring respiration assistance. As hospitals' COVID patient load grew the number of patients requiring oxygen and ventilator support stretched the medical gas systems to performance limits. Bulk oxygen system vaporizers began to freeze up. Standby medical air compressors ran continuously. Yet many of these systems were not able to consistently maintain required pipeline pressures, and the reduction in line pressures impacted patient treatment.

We have learned that some of the oxygen and medical air assumptions in Environment of Care plans did not adequately meet patient needs during the crisis. Health care facilities expect medical gas systems to meet several key requirements: Efficiency, Quality, Safety, Sustainability, and Affordability. These systems are complex and must be able to flex with changing patient demand. Yet prior to this epidemic, resiliency was not usually on the list of requirements.

A medical gas system is made up of several integral components. A change or adjustment in one component can have a negative impact on another aspect of the system. Resiliency can only be achieved by a comprehensive evaluation of all system components before making any changes. *For instance, increasing the pipeline pressure of the oxygen system without adjusting the alarm settings of all the alarm panels will cause chaos.*



How can FSMT help?

FSMT has developed a range of services to assist hospitals with these unique challenges:

1. **Medical gas sizing evaluation:** Using updated assumptions on the probability of multiple outlets simultaneously in use, a peak use calculation can be prepared. With this information, an updated evaluation of the adequacy of source producers and cryogenic equipment can be made.
2. **Readiness testing for use of supplemental supplies:** By periodically testing Emergency Oxygen Supply Connections (EOSC), FSMT verifies both operation and performance of this method to introduce additional oxygen supplies.
3. **Availability of supplemental supply kits:** Back-feed connections to both oxygen and medical air systems require correct fittings, hoses, and regulators. FSMT can provide supplemental supply kits specific to the needs of the individual hospital. These kits enable a facility to quickly add high pressure cylinders and/or Dewars to the gas system when temporary additional flow or pressure is required.
4. **Outlet/inlet tune-ups:** As medical gas outlets age, seals deteriorate, mechanical components wear, and gas flow can be impacted. Replacing worn and aging outlets/inlets on a preventative basis provides confidence that, when needed, delivery of gases will operate at peak performance.

We are working with other industry leaders for the benefit of our clients.

FSMT is honored to participate in the **International Association of Plumbing and Mechanical Officials (IAPMO) Medical Gas Resiliency Task Group**. The taskforce scope is to develop modifications to medical gas design and installation guidelines that will ensure medical gas systems are capable of handling variable loads. FSMT Chief Executive Officer, Dale Terry, serves on the resiliency group.



Available Services

- ✔ Medical Gas System Inspections Including Source Equipment
- ✔ Comprehensive Medical Gas Repairs & Parts
- ✔ ASSE 6040 Training for Engineers (Meeting TJC, CMS, & NFPA)
- ✔ Articulating Boom Inspections (Including Internal Parts and Mechanical Operation)
- ✔ Emergency Oxygen Supply Connection Function Testing
- ✔ Waste Anesthetic Gas Testing (WAGD) (Compliant with NIOS)
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Contact us today for a quote!
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