



Medical Gas Pipeline Systems Training: Hospital Oxygen Supply, Testing and Safe Operation

16 – 20 May 2027

Riyadh - KAFD district five-star



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Introduction:

Medical Gas Pipeline Systems Training on hospital oxygen supply, testing and safe operation is a 5-day course for engineering, estates, biomedical and patient safety staff, ending with a Medical Gas Operational Policy and Planned Shutdown Procedure for a case hospital. Hospitals face ward oxygen failures, cross-connected outlets and unplanned isolations when supply plant, zone valves and alarms run without clear roles, testing or planned shutdowns. Nominees already operate, maintain or oversee piped gas services, and the course is taught through inspection walkthroughs of plant rooms, valve points and ward outlets. CoreConcept Training Center delivers this medical gas pipeline systems course.

Course Objectives:

- Identify each piped medical gas, its clinical use and the hazards of supplying the wrong gas or none at all
- Evaluate oxygen, medical air and vacuum supply plant, including liquid oxygen vessels, cylinder manifolds, PSA concentrator plant, compressors and AGSS, against NFPA 99 and HTM 02-01
- Inspect zone valves, terminal units and alarm panels and interpret their signals during normal running and faults
- Plan pressure, cross-connection, purging and gas identity and purity tests before a pipeline section is certified for patient use
- Apply authorised and competent person duties, permits to work, cylinder controls and oxygen fire precautions to planned shutdowns and maintenance
- Prepare a Medical Gas Operational Policy and Planned Shutdown Procedure with surge oxygen contingencies for a case hospital

Target Audience:

- Estates and hospital engineering staff who run medical gas plant rooms, manifolds and liquid oxygen compounds
 - Biomedical and clinical engineering staff responsible for terminal units, flowmeters and equipment connected to piped gases
 - Facilities supervisors who issue permits, coordinate contractors and arrange isolations on ward and theatre pipework
 - Pharmacy and medical gas quality staff responsible for gas identity, purity checks and cylinder stock
 - Patient safety and nursing operations staff who prepare clinical areas for shutdowns and respond to gas alarms
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Course Outline:

Day 1: Medical Gases, Clinical Uses and the Hospital MGPS Baseline

- Medical Oxygen, Medical Air and Surgical Air Clinical Uses
- Nitrous Oxide, Carbon Dioxide and Surgical Nitrogen Clinical Duties
- Medical Vacuum and AGSS Roles in Theatres and Wards
- MGPS Schematic Drawing Review From Source to Terminal Unit
- Gas Consumption Survey and Current-State Risk Assessment Checklist

Day 2: Supply Plant, Pipeline Design and Governing Standards

- NFPA 99 and HTM 02-01 Structure and Scope Compared
- VIE Liquid Oxygen Vessel and Cylinder Manifold Back-Up
- PSA Oxygen Concentrator Plant Output Purity and Redundancy
- Medical Air Compressor Plant Dryers and Dew Point Monitoring
- Vacuum Plant, AGSS Units and Copper Pipeline Sizing Rules

Day 3: Zone Valves, Terminal Units, Alarms and Verification Testing

- AVSU Zone Valve and Line Valve Assembly Placement
- Gas-Specific Terminal Unit and NIST Connector Checks
- Plant, Area and Emergency Alarm Panel Signal Testing
- Pressure Drop, Cross-Connection and Flow Testing Sequence
- Purging, Gas Identity and Purity Verification Before Certification

Day 4: Operational Management, Permits, Fire Safety and Resilience

- Authorised Person and Competent Person Appointment Matrix
- MGPS Permit to Work and Planned Shutdown Sequencing
- Cylinder Storage, Handling and Oxygen-Enriched Fire Precautions
- Surge Oxygen Demand Modelling and Emergency Supply Contingency
- Planned Preventive Maintenance and Annual MGPS Audit Findings

Day 5: Inspection Walkthrough and Medical Gas Operational Policy

- Case Hospital Plant Room and VIE Compound Walkthrough
 - Ward and Theatre Zone Valve and Terminal Unit Inspection
 - Gas Alarm Response Flowchart and Clinical Notification Cascade
 - Planned Shutdown Procedure for a Case Hospital Ward Block
 - Medical Gas Operational Policy Completion and Peer Review
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Skills You Will Gain:

- Medical Gas Hazard Recognition
- Oxygen Supply Plant Evaluation
- Zone Valve and Alarm Interpretation
- Pipeline Verification Test Planning
- Permit to Work Control
- Cylinder Safety Management
- Surge Oxygen Demand Planning
- MGPS Audit Reporting

Why Attend This Course:

- Deliver a Medical Gas Operational Policy and Planned Shutdown Procedure to the estates director and medical gas committee for adoption
- Decide when a pipeline section can be isolated, tested and returned to patient use, and who must sign each step
- Avoid ward oxygen failures, wrong-gas connections and oxygen-fed fires caused by unclear roles and untested work
- Brief porters, nurses and contractors on cylinder handling, alarm responses and shutdown preparation using shared checklists

Conclusion:

Back at work, the participant gives the estates director and the hospital medical gas committee a Medical Gas Operational Policy and Planned Shutdown Procedure that names authorised and competent persons, permit rules, alarm responses, cylinder controls and surge oxygen contingencies. The committee uses it to approve future isolations, contractor works and oxygen supply investment, while clinical leads use it to prepare wards for shutdowns. After the first planned shutdown, the committee should review permit records, alarm response times, oxygen consumption and any delays to clinical care.

Frequently Asked Questions FAQ:

What should participants know before medical gas pipeline systems training?

Participants should already work around hospital plant rooms, wards or theatres and know how their site requests maintenance. Bringing a medical gas schematic, a recent alarm log or a permit form helps them apply the walkthrough exercises to their own hospital.

How does medical gas pipeline systems training differ from a general medical equipment management course?

It concentrates on the piped gas infrastructure: supply plant, pipework, zone valves, terminal units, alarms, testing and permits. Medical equipment management courses cover inventories, maintenance and replacement of devices, which this course touches only where equipment connects to terminal units.

Why do medical gas pipeline systems need planned shutdown procedures?

Isolating a zone valve cuts oxygen or vacuum to patients, so every shutdown needs clinical agreement, portable cylinder cover, a permit and a tested return to service. A written procedure prevents rushed isolations and wrong-gas reconnection.

What do participants take back from medical gas pipeline systems training?

Participants take back a Medical Gas Operational Policy and Planned Shutdown Procedure for a case hospital, with role appointments, permit steps, alarm response flowcharts, cylinder controls, surge oxygen contingencies and inspection checklists they can adapt to their own site.