TOP 10 CONSIDERATIONS FOR MRI SERVICES

COMMITTED TO ENHANCING PATIENT EXPERIENCES AND OUTCOMES

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TOP 10 CONSIDERATIONS FOR MEDICAL SERVICES

Committed to Enhancing Patient Experiences and Outcomes – our expertise, earned over decades in the industry – ensures our products and services will maintain the optimal performance of the RF shielding for an MRI suite. Our veteran team offers a comprehensive range of solutions tailored to meet the unique needs for your MRI suite to extend the optimal performance of your MRI's RF and magnetic shielded enclosure. With products and services that are trusted for their quality, reliability, and performance in critical environments, we ultimately contribute to the safety and efficiency of MRI healthcare facilities.

To ensure continuous operation of your MRI system, it is important that the shielding effectiveness or RF performance meets the MRI magnet manufacturer's specification to eliminate imaging artifacts such as zippers and optimize clarity. It is also important to address ease of use for staff and patients utilizing this space for procedures on a daily basis. For this reason, we have assembled the "Top 10" considerations to guide you in your decisions for medical services.

1. What maintenance is suggested for RF Doors?

RF shielded doors are designed to provide a high level of shielding performance which is crucial to maintain due to the sensitivity of the MRI magnet. The doors are also most susceptible to damage and general wear and tear as they are heavily utilized throughout the day. Additional factors adversely impacting the door's RF shielding performance may include a buildup of dust and dirt, janitorial cleaners, and occasional accidental bumps from wheelchairs or gurneys. A reduction in RF shielding performance places the optimal operation of the MRI magnet at risk – limiting the ability to produce quality images, thus impacting patient care, throughput, and facility revenue. Annual or bi-annual maintenance of doors is recommended to ensure the overall shielding effectiveness of the shielding system and prevent costly MRI scanning down time. It is recommended that facilities' personnel clean the door and door jamb on a monthly basis to eliminate dirt and other contaminants that will prevent proper sealing of the door. An annual service is recommended to evaluate the door's performance and make any adjustments required to the door to maximize performance including replacing possible damaged seals to ensure proper operation and sealing, inspecting features such as automated seals, openers, and closers, as well as performing a thorough cleaning.

Often RF shielded doors are customized to meet specific needs with options such as keypads, card readers, IV feedthroughs, compressors, and maglocks that may also need consideration for inspection and maintenance. Ask if your RF shielded door supplier offers services to help maintain the functionality and performance of your RF shielded doors, to ensure your MRI suite maintains optimal RF performance and ease for patients and staff. You do not want to wait until something is defective before you reach out for repair.

2. What is the importance of RF shielding maintenance?

Periodic RF shielding performance verification testing is recommended to ensure the integrity of the shielding is maintained. This testing should be performed any time a new accessory, injector, or other feature is installed on the RF shielded enclosure. An RF test with diagnostics provides RF shielding performance integrity data to identify leaks or degradation of the shielding. A mitigation plan, if required, should be offered to address any degradation of performance. If the shielding performance is compromised, the MRI magnet will be placed at risk of developing imaging artifacts that adversely impact the quality of patient service and potentially result in expensive down time. Performing a shielding performance integrity test at the same time as annual door service is always a good idea to avoid expensive down time and ensure continued throughput of patients.

3. Why would I need to replace an RF shielded door and what advantages does that offer?

It is not uncommon for facilities to upgrade or replace their RF shielded door at some point. Perhaps you're upgrading the MRI magnet, the standard life of the existing suite door has ended, or you desire enhanced sound reduction on your door to provide a better experience for patients and staff. There are many things you should consider when replacing or upgrading your door. With today's modern technologies, there are many different options for RF shielded doors. Some RF doors offer flat or remarkably close to flat thresholds thus easing the challenge of navigating the threshold with MRI-safe wheelchairs and gurneys. Doors that offer options for an automated opener and closer aid staff in transporting non-ambulatory patients. Doors may also offer an option for IV ports in the door jamb for procedures that require IV tubes that cannot be disconnected from the patient for health and safety reasons. These doors enable IV tubes to be easily and safely passed from the control room to the MRI suite. RF shielded enclosure vendors may also provide security options such as keycard readers, keypads, or biometric scanners to ensure the MRI suite is secure when not in operation or for doors that are not easily monitored by the MRI staff. Another issue to consider is acoustics as MRI magnets create significant levels of noise that can adversely impact patient and staff comfort. Ask your RF shielded door provider if they offer doors with a range of sound transmission class (STC), such as STC 28 through STC 44 acoustic packages, to help address noise control.

One should also consider what will be required to replace the RF shielded door. Can the door be easily replaced, or will it require the removal of finishes and modifications to the shielding to accommodate the new door? It is important to understand what will be involved with the door upgrade replacement to develop an accurate view of the costs and downtime. Your RF shielded door provider should assist you in planning the door upgrade, presenting all the options available, and identifying the best solution for your suite.

4. When do I need to add a filter or waveguide to the RF shielded enclosure system?

Are you looking to add a new piece of equipment to your MRI suite that requires power, communication, or routing of fiber optics to the control room or equipment room? All new additions to your room require penetration of the RF shielded enclosure system, which if not done correctly will lead to degradation of the RF shielding system performance and increase the potential for imaging artifacts, thus limiting a facility's ability to accurately scan patients and perhaps resulting in costly down time. Always contact a qualified RF shielding vendor to assist you in identifying what filtering or feedthroughs are required to effectively penetrate the RF shielding. As a rule of thumb for MRI suites, a manufacturer of any approved component or system for an MRI magnet should be able to identify the proper connection. A qualified shielding vendor can also assist in identifying the correct communication/data filter to use for a particular application; however, the equipment provider should have already qualified this penetration. A qualified RF shielding vendor will also install new filters and penetrations, ensuring the RF shielding integrity is maintained while verifying performance via an RF shielding effectiveness test.

5. Should you modify your shield when you upgrade your Magnet or D-Stream Software?

When upgrading to a new magnet or D-Stream software, you may also need to consider if upgrades or modifications to your shielding system may be required. Will our RF shielded system meet the performance criteria? How old is our existing shielding system? Do we need to replace the magnet interface panel? Will we require magnetic shielding or the removal of magnetic shielding? How do we remove the old system and bring in the new system safely? How can we maintain a schedule and budget for this effort? These questions cannot be answered without contacting a representative from your RF shielded enclosure provider. Since the answers are specific to your MRI suite and your choice of an MRI shielded system, they must be explored with careful consideration of your existing MRI suite. Contact your RF shielded system representative to create a detailed plan for your upgrades.

6. What are the benefits of entryway versus screener versus hand-wand ferromagnetic systems, or TechGate® systems, for MRI environments and how do they ensure safety?

When it comes to ferromagnetic detection, many systems are available to enhance safety processes in MRI environments for patient and staff safety. Your ferromagnetic detection provider should not only provide the equipment, but also ensure its proper installation and offer comprehensive training to healthcare staff on its use and maintenance. Additionally, assistance with safety protocols provides an end-to-end approach to ensure that healthcare facilities can maintain a safe and secure MRI environment.

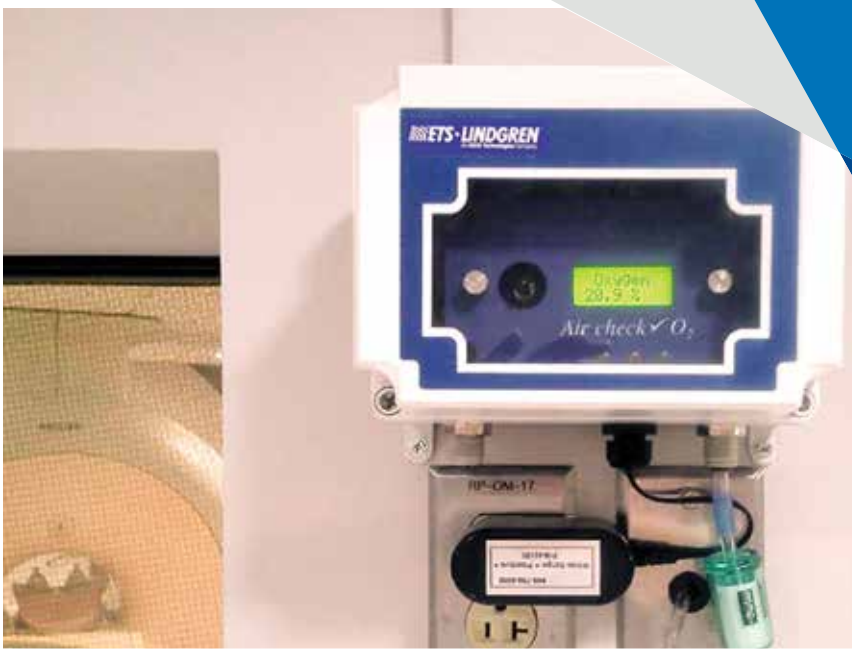
Does conformance to the guidelines published by the Centers for Medicare and Medicaid Services (CMS), American College of Radiology (ACR), and/or the Facility Guidelines Institute™ (FGI) need to be considered? While RF shielded enclosure manufacturers are not directly involved in these associations or accreditations, leading manufacturers offer sources to help implement the recommended or required compliance solutions.

Patient and staff safety is one of the primary concerns when designing an MRI imaging suite. Optimization of patient and staff ingress and egress through these controlled areas requires additional unique design considerations that may not be contemplated for other areas of the healthcare suite.

When it comes to ferromagnetic detection, optimal systems should include the entryway, wall-mount patient screeners, and handheld detectors, designed to identify ferromagnetic objects. These systems enhance safety in MRI environments by alerting healthcare staff to the presence of potentially hazardous objects. Many facilities have a safety plan or perhaps a MRSO (Magnetic Resonance Safety Officer) that would determine the type of detector that best fits your facility. Entryways are for scanning as staff and patients enter the room, screeners allow you to review potential dangers prior to entering the space, and handhelds are similar but work well when patients cannot stand.

In addition to the above more common types of detectors, an automated physical barrier may help control access to the MRI suite and alert people to the dangers posed by the MRI. This system allows your staff to safely prepare patients for the scan without the concern of someone entering a Zone 4 (hazardous zone where magnetic fields are greater than 5 gauss) freely and/or prevent an unknown person from entering the space while the room is being prepared by staff for a scan.

This end-to-end approach ensures that healthcare facilities can maintain a safe and secure MRI environment.



7. How do modern oxygen monitor systems contribute to patient safety in healthcare settings? What are the key features of their oxygen sensors and data interfaces for seamless integration with medical equipment and hospital information systems?

Leading RF shielded enclosure manufacturers offer essential components such as an oxygen monitor system in healthcare settings. Oxygen sensors are engineered for precise monitoring of oxygen levels, which is vital for patient and staff safety during medical procedures. These sensors are known for their accuracy and reliability. Oxygen monitors also feature data interfaces that enable the seamless integration of oxygen monitoring into medical equipment and hospital information systems. This real-time tracking of oxygen levels ensures the well-being of patients and contributes to the quality of patient care provided in medical facilities.

When considering an oxygen monitoring system, it is not only important to select a monitoring system that is effective, but also interfaces with building management systems and is cost effective to maintain. Oxygen monitoring systems typically require the replacement of the sensor and/or filter in the system with some systems requiring replacement every 12 to 18 months. This results in a cost of thousands of dollars per replacement or lifetime maintenance costs in the tens of thousands of dollars. Ask your RF shielded enclosure manufacturer about the oxygen monitoring system, what maintenance is required, the associated costs, and how often this is required. This simple step could significantly reduce your maintenance costs from those provided by another oxygen monitoring system manufacturer.

8. What should you look for when sourcing LED lighting for your MRI system?

LED lighting has become the new standard for lighting in modern MRI suites. If you have an older suite utilizing DC incandescent lighting, LED lighting can reduce maintenance costs by eliminating the need to regularly replace light bulbs which lowers operational costs. Soft white LED lights and those in down light installations are most soothing to enhance patient comfort. Before you consider replacing your incandescent lights, ensure the new LED lights are designed and tested for MRI suite applications. Ask about options for dimmable equivalent 150 watt down lights that feature a high performance, light emitting diode with no UV, IR, or RF emissions. Features such as engineered heat displacement in a low-profile result in long lasting LED lights. A flat panel LED light option may be available; this is an excellent lighting solution for MRI suites with limited ceiling space and other similar applications. These lights consist of an LED lighting guide-plate with built-in LEDs, and provide an efficient, no glare, and uniform luminance across the lighting panel. Ask if the new lighting includes an external LED driver power supply and meets all MRI magnet vendor siting requirements for lighting.

9. What options are available for improving patient comfort?

Creating an environment that enhances patient comfort improves patient satisfaction and increases patient throughput by placing a patient at ease. Patient comfort options may include S-Glass which provides MRI staff with a privacy option for windows that can be incorporated directly to the glass eliminating the need for blinds or ancillary options for covering windows to provide privacy. Graphic displays can be mounted on the wall or ceiling to ambient lighting, providing a soothing environment for the patient. Ensure patient comfort products are MRI safe, utilize green technology, and can be easily retrofitted to the MRI suite.

10. Why are maintenance agreements or service contracts a good idea when purchasing an RF shielded enclosure? Is it possible to move an MRI suite?

Your RF shielded enclosure is often a forgotten about aspect of the MRI suite, but is essentially a workhorse integral to the overall performance of the MRI suite. If the RF shielding system degrades or is damaged, the result may be image quality issues that could adversely impact patient care and lead to costly down time. Therefore, the RF shielded enclosure should be viewed as a piece of capital equipment similar to the MRI magnet that requires regular maintenance to ensure optimal performance and maximize uptime. Consider service contracts and preventative maintenance services by professional, trained technicians to encompass:

a. **On-Site Inspection:** RF doors, shields, accessories, and associated equipment are inspected to identify any issues or deficiencies.

b. **Routine Maintenance:** Schedule routine maintenance on a regular basis to ensure that doors, RF shields, and equipment are in optimal condition. This includes replacing worn components and conducting preventive repairs.

c. **Detailed Report:** After each maintenance visit or inspection, a detailed report is provided on the work performed, including any identified deficiencies and recommendations for improvement.

Although rare, some MRI suites are relocated within a healthcare facility or to another location due to a variety of reasons, such as a facility remodel or expansion, sale of a practice, etc. This is not always an option but with an experienced RF shielded enclosure provider, this may be possible and a cost-effective option to consider. An estimate for this service and the scope of work may be provided to help with your planning.

While we have outlined the "Top 10" considerations, there are many more specific concerns to consider depending on your location, the type of equipment you're utilizing, the amount of time your equipment is operating, and what types of accessories you have. In addition, consider how much red tape you may have to go through to implement your plans within your organization or facility as a result of the many options and choices available in the marketplace. We hope you found this "Top 10 Considerations for Medical Services" useful to ensure optimal performance of your RF shielding system and maximum return on your MRI suite investment. Contact your RF shielding regional sales manager or representative for further information or discussion.

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