

TERMS OF REFERENCE AND TECHNICAL SPECIFICATIONS

i. General information

Assignment name	Supply and delivery Magnetic resonance imaging (MRI)
Beneficiary	Medical Research and Care Center (MRCC)
Country	Iraq
Total estimated number of months	10 months

The Medical Research and Care Center (MRCC) consist of following blocks:

Block A: Central diagnostic block, which comprises the medical imaging department (conventional radiology, MRI, CT-Scan, Gamma Camera, PET-CT), biochemistry, histopathology, microbiology, hematology, and laboratories.

Block B: Cardiology.

Block C: Gastrointestinal.

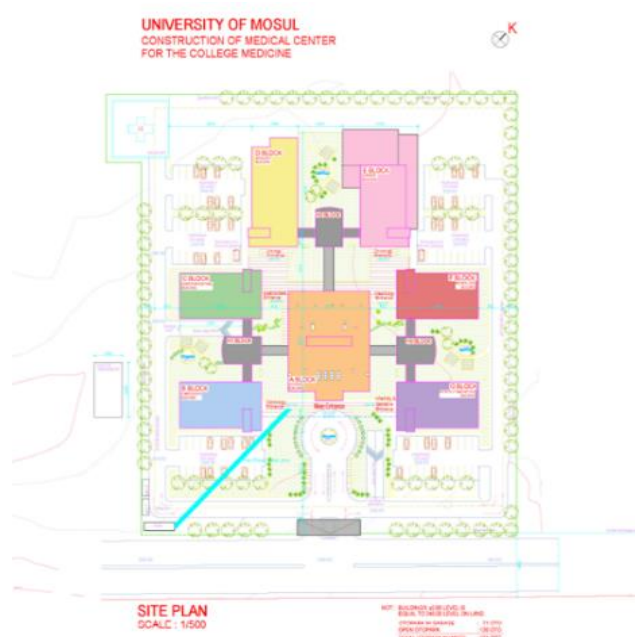
Block D: Nephrology and Urology.

Block E: Oncology.

Block F: Neurology and Neurosurgery.

Block G: Genetic infertility.

The MRCC requires medical equipment tailored to the specific needs of each specialized block.



Rehabilitating and operating the MRCC is crucial as many of the public hospitals in Mosul were severely damaged during the ISIS occupation.

Till now, critical healthcare services are still missing or not sufficiently offered to cover the needs of the vulnerable population, such as radiotherapy and chemotherapy.

The MRCC could help improve the quality and accessibility of healthcare services in the Nineveh governorate and improve the UoM's medical education and research.

ii. Context and justification of the need

Following a preliminary feasibility study conducted between May and September 2021 by Expertise France (EF) and La Chaîne de l'Espoir to assess and define the rehabilitation and development needs of the Medical Research and Care Center (MRCC) in Mosul, EF with a team of experts conducted a second feasibility study from December 2021 until June 2022.

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MRCC, a 150-bed teaching hospital located at the University of Mosul in Mosul-Ninawa Governorate, Iraq, is seeking MRI equipment services to replace an abandoned MRI (HOT magnet). This endeavour aims to support and enhance the capacity of medical imaging and support services for different medical specialties as per identified blocks.

iii. Objectives and desired results

1) General objective

The objective of those supplies is part of reopening and providing optimum Radiology services in the Medical Research and Care Centre MRCC. Expertise France willing to supply:

1.5 MRI (magnetic resonance imaging). The requirements for medical equipment **1.5 T MRI (magnetic resonance imaging)** covered by this TOR will be a new, modern design with materials of the best quality.

2) Specific objectives

This tender is composed of a single lot for equipment and services.

- **Supply, turnkey installation, commissioning (including regulatory checks), updates, maintenance, and training using the new MRI.**
- **Disassembly and removal of old MRI device model: GE model Signa.**
- **Infrastructure and site readiness works, including MEP (mechanical, electrical plumbing) technical constraints and architectural finishes in order to have this radiology room available for patients' services.**

Item	Block	QTYs
Magnetic resonance imaging (MRI)1.5 T	A	1
MRI mini-chiller (See Annex 5 for Specs.)	A	1
Smart UPS 160 KVA	A	1

The proposal shall include the services below:

The lot includes the procurement from supply to delivery to installation, commissioning and warranty. The services include:

- De-installation of the current damaged MRI.
- Pre-installation preparations and checks.
- Supply, delivery, and installation of the equipment.
- Restoration of any damage caused during delivery and assembly.
- Assembly, commissioning, and calibration of the devices.

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- Completion of administrative procedures, on-site inspections, and necessary tests for regulatory compliance and commissioning. This includes the provision of consumables required for these tests.
- Warranty coverage, including preventive and corrective maintenance. This covers travel, labor, and replacement parts.
- Training of technicians and engineers, including any required travel and accommodation. Upon completion of training, engineers and technicians will be authorized to handle and commission the equipment within the limits specified by their authorization. They will also receive training materials.
- Handling and commissioning of the equipment.
- Authorization for intervention on medical devices within the specified limits.
- User documentation (Manuals and datasheets) and certification in English. If available, documentation in Arabic should also be provided.
- Supplying all (MRI Compatible) items along with the MRI Device (All specifications in Annex 2)

iv. Description of the assignment

1) Planned activities.

- Disassembly and removal of old MRI device from GE model Signa.
- Implementation of new MRI

The implementation of the 1.5 Tesla MRI requires transformations/arrangements of the premises. These will **be completely covered by the successful bidder** (see Annexes). The latter carries out an installation study of its equipment in order to verify its compatibility with the premises and existing technical infrastructures.

- Infrastructure works, including MEP and architectural finishes to have this radiology room available for patients' services.
- Old device extraction points and new device entry points shown in Annexes 4.

For all aspect biomed, Infra and MEP subjects:

- Feasibilities and assessment on site,
- Supply, delivery and installation,
- Maintenance and warranty
- All required tests from local authorities to handover the machine

Assignment preparation

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This contract is a public supply contract, aimed at the acquisition, installation (including necessary work), commissioning, maintenance, training for a 1.5 Tesla MRI.

- Post-assignment follow-up: Follow up the implementation of the project according to the technical specifications

2) Anticipated deliverables

Deliverables	
Site visit report or assessments	
Technical documentation & plan for selecting the best equipment	
Methodology, layout, for new MRI installation	
Methodology for dismantling old equipment	
Technical details, layout and methodology for infra and MEP works of the specific room	
Submit the delivery plan for or MRI system including the (Shipping, delivery to the site, installation, commissioning, warranty and training).	mentioning the delivery
Service job report	
Methodology for the taking-over of the equipment and the list of required tests to be done	
Installation report	
Taking-over documents for all biomed, infra and MEP subjects	
Maintenance plan	
Maintenance and warranty report at the end of the project	

As part of the contract, each of the Tenderers must:

1. Define an activity schedule and the commissioning of the various equipment proposed, with deadlines for delivery, installation and training.
2. Specify for each piece of equipment:
 - Environment conditions: evacuation, air-conditioning of the premises (temperature and hygrometry conditions, heat release of the equipment) and necessary extraction required per unit.
 - Necessary power supply
 - Voltage (values, tolerance)
 - Frequency (values, tolerance)

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- Maximum power consumption
- The equipment suitable for working in the climate conditions of Iraq in terms of temperature & humidity.

v. Place, duration, and terms of performance

- 1) Implementation period: **10 Months**
- 2) Start date: **May 2025**
- 3) End date: **February 2026**
- 4) Schedule/program: **to be provided by the supplier.**

vi. Required expertise and profile.

A. General professional experience

- The eligibility for participation in this tender is limited to companies that possess both the "Manufacturer's Authorization" and certification as an official distributor. Additionally, they must be registered in the Ministry of Health (M.O.H) of either the Federal Government of Iraq or Kurdistan Region Authority.
- To be considered for this tender, companies must have technical teams capable of either traveling to or being based in Mosul. These teams will be responsible for the installation and training of medical staff in the MRCC.
- By submitting a proposal, the supplier agrees to fully and unconditionally accept the special and general conditions that govern this request for proposals and the proposed contract (Annex...). The supplier acknowledges that these conditions, outlined in the provided Annex, serve as the sole basis for this procurement process. Any other sales conditions are hereby waived by the supplier. Tenderers are required to carefully review and adhere to all instructions, forms, contract provisions, and specifications provided in the tender dossier.
- It is strongly advised to thoroughly read and comprehend the tender rules document and its annexes. Failure to adhere to the procedures outlined therein may result in disqualification from the evaluation process

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B. General articles and requirements

ARTICLE 1: General requirements

- The bids must include all the equipment necessary for the correct operation of the device.
- All materials will be according to the international high quality
- The implementation will therefore be done at the optimum level to ensure the correct implementation of the installations, and the proper functioning from the start-up.

ARTICLE 2: Compliance with texts

- All supplies must comply with the texts and current standards at the time of installation and commissioning.
- The supplier is required to meet the regulatory requirements for placing on the market in accordance with laws of medical devices and decrees of the Public Health Code.
- The attestation certificates must be attached to the Tenderer's proposal, specifying the class of the device as well as the appendices that served as a reference

ARTICLE 3: Manufacturer's Authorization Form

The authorization certificate must be attached to the Tenderer's proposal includes the following format:

MANUFACTURER'S AUTHORIZATION FORM

(to be submitted by authorized manufacturers/importers in a **letterhead**)

No. Dated:

To: Expertise France

MRCC / Medical equipment tender n°1 committee

Dear Sir / Madam,

Equipment/Item Name:

1. We (Name of the OEM) are the original manufacturers of the above equipment having a registered office at
(Full address with telephone number/fax number & email ID and website), having factories at and, do hereby authorize M/s.
(Name and address of Tenderer) as submit bids, and subsequently negotiate, sign the contract and to supply, install & commission the above items with you against the above bid no.....

2. We also hereby undertake to provide full guarantee/warranty /CMC/AMC as agreed by the Tenderer in the event the Tenderer is changed as the dealers, or the Tenderer fails to provide satisfactory after sales and service during such period of Comprehensive warranty/CMC/AMC and to supply all the spares/reagents / consumables for 5 years.

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3. We also hereby declare that we have the capacity to manufacture and supply, install, and commission the quantity of the equipment's bided within the stipulated time.

(Name)

for and on behalf of M/s. _____

Date: (Name of manufacturers)

Place:

Seal

ARTICLE 4: Training (Application and Service training):

The offer must include full support: travel, accommodation, training costs, meals (lunch, accommodation) for the following personnel:

- End user (user training): The medical and paramedical team (day and night team).
- The Biomedical service (technical training): The biomedical engineer and/or the biomedical maintenance technicians (at least 3 persons)
- Technical training must be completed before the end of the warranty period.
- This will be sanctioned by a personal certificate, issued to each participant, stipulating that the level of skill required to ensure maintenance has been acquired by the technician.

During this training, all the necessary information must be provided:

- Complementary technical documentation.
- Set of computer access codes to the maintenance software, if applicable.
- List of the main spare parts to be kept in stock for MRCC
- The overall training offer must indicate the training schedule (periods, times) as well as the place and the planned training methods.

Reminder:

The Tenderer also undertakes to train again, at his own expense, the user, medical and biomedical teams, in the event of changes to the devices supplied (hardware or software changes).

The training may be postponed of several months after the installation and commissioning phases, if the biomedical and technical teams of the MRCC are not designated yet.

ARTICLE 5: Organization of delivery, installation, and commissioning reception

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The delivery of equipment to the service premises, assembly, installation and commissioning are the responsibility of the Tenderers,

They must explicitly show the conditions of ground load, electrical power supply, average power, peak power absorbed, the tolerable temperature in each room (in particular the maximum tolerable variation gradient).

The Tenderer is deemed to know the places for having visited them. The visit is mandatory. To do this, it will be up to him to make a written request to CONTRACTING agency, which will set up an appointment for him, as precise in the tender rules.

If disturbances are observed when the equipment is put into service or immediately afterward, it is the holder's responsibility to take all useful measures to remedy them under conditions approved by the Hospital Center or, failing that, to provide proof recognized by an official body that these disorders are not attributable to the interventions made under its responsibility or to the equipment installed by it. The mandatory tests and inspections for the commissioning of the equipment and the verification of their performance will be carried out before receipt according to the manufacturer's recommendations and the regulations in force.

The cost of these operations is the responsibility of the Tenderer.

Contracting agency shall bear no responsibility over losses or damages of the procured products incurred during the performance period and before acceptance of said products. The supplier bears the responsibility to verify and certify that the goods they supply are in keeping with the conditions applicable to them.

The supplier commits to provide Contracting agency with goods that will not be subject to manufacturing defects, that have not been exposed to contamination or to anything causing premature wear. Products supplied by the Supplier are covered by a **warranty period**.

It is therefore up to the supplier to ensure the products if necessary.

The total quantity of the product should be well packed in compliance with European storage rules or equivalent.

Before each delivery, the supplier has to submit a copy of the delivery note and all the shipping documents detailed below BEFORE loading and shipping the goods, at least one month prior the arrival of the device to IRAQ in order to get the formal agreement from EF to deliver the goods.

For every consignment, the supplier shall always send a delivery note. Delivery slips shall necessarily bear the Contract Reference and / or Purchase order number, batch numbers, serial numbers if any, the full designation and quantities of the delivery.

Added to the delivery note, the selected supplier will also have to provide EF and MRCC with:

- a delivery notes and / or Packing List
- a commercial invoice

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- a Certificate of Origin from the manufacturer.
- a Certificate of Conformity or Certificates of Analysis (if applicable)
- other documents.

The Supplier commits to inform Contracting agency any constraint or specific regulation linked to the goods or service supply or to the country of importation

In case of international sea or air transport: After the agreement from the entity that placed the order, 3 original sets + 1 copy of these documents will be sent by express courier within four (4) working days after products have been loaded to the EF and MRCC entity that placed the order. A Bill of lading or Airway Bill (3 originals + 1 copy) filled with all the required information has to be added to the documentation.

The supplier shall put in place, and communicate to EF, their internal quality control system, if EF deems it necessary for the guarantee of the supplier's products.

The Supplier will inform Contracting agency about all quality certifications, labels (NF, ISO, CE...) and internal quality process that may apply to its goods or services and will supply all official documents upon Contracting agency request.

EF reserves the right to verify or use the services of a third party of its choice to verify the implementation by the supplier of the quality control procedures laid down in the supplier's quality control system.

Non-conformity of delivery

Should the quality or the condition of the products not satisfy CONTRACTING AGNECY requirements at the moment of the preliminary inspection or delivery inspection, CONTRACTING AGNECY reserves the right to demand:

- The delivery of products which conforms to the order. They will need to be replaced by the Tenderer at his/her own expenses. The replacement will be executed as soon as possible, at latest within fifteen (15) calendar days from the discovery of the non-compliance (from the issuing of a certificate of non-conformity). The replaced products will again be subject to the rules laid down in this contract, including the twelve (12) month guarantee (IF APPLICABLE)
- Or the immediate reimbursement of the payment
- Or the cancellation of the order and of the corresponding price.

ARTICLE 6: Upgrade

The contract being notified for several years, the homogeneous evolution of all the equipment is planned with this contract.

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This evolution concerns both the hardware part, software and accessories.

For each of the products and software offered, the Tenderer will list the major hardware and/or software developments already implemented since the date of first commissioning.

It will imperatively be indicated the version of the software provided.

The Tenderer will specify which hardware and/or software developments are planned, detailing:

- the nature of the expected change,
- the methods of implementation,
- the planned publication date or the planned periodicity,
- the approximate additional implementation cost.

The Tenderer will also indicate which characteristics (technology, architecture, etc.) facilitate the subsequent development of the products offered.

The Tenderer will specify the terms of support for upgrades, hardware and software developments and undertake to do so contractually.

The Tenderer will commit in particular to the tariffs and/or the minimum discount rates which will be practiced during the operation of the equipment.

In the event of technological development of its products, during the period of execution of the contract, the selected supplier may propose to substitute a new product for the old one. This substitution can only be effective after written acceptance by the manager of the establishment and without change in the unit price.

ARTICLE 7: Medical equipment fitting and Room layouts (loaded drawings)

The Tenderer has to provide the medical equipment that will be fitted according to room layout. In this tender, the specific room details will be provided later to recognize the equipment locations.

ARTICLE 8: Validity period of the Offer

bidders remain bound by their offer for a period of **120 calendar days**, from the final date of receipt of the offers.

vii. Assignment reports

A report following the model provided must be forwarded by e-mail on conclusion of the assignment: it must correspond with the deliverable summary analytical report ...

viii. Monitoring-evaluation

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Performance indicators

Deliverables	Immediate effects	Intermediate effects	Verification sources

ix. Personal Protective Equipment (PPE) for Construction

Required personnel protection equipment (PPE) must be always worn when on construction or renovation sites at Princeton University. At a minimum, each employee is required to wear a hard hat and safety glasses. High visibility safety vests with reflective striping are required when employees are exposed to vehicular traffic. In the absences of vehicular traffic, high visibility shirts should be always worn. All workers must wear shirts with sleeves, long work pants, and sturdy work shoes or boots when working on a construction or renovation site. Sleeveless or tank top shirts, short pants, sweatpants, sneakers, sandals, and high-heeled or open-toed shoes are not permitted.

Depending on the circumstances and potential hazards present, additional PPE may be required. This determination will be made by your supervisor based on the preliminary Job Hazard Analysis; EHS may also be consulted. Additional PPE may include:

Protective gloves

Hearing protection

Full face shields when cutting, grinding, or chipping.

Chemical splash goggles

Respiratory protection

Fall protection equipment when working above 6 feet

Specific protective clothing such as welding leathers when welding or FR clothing when working with live electric.

x. Technical Data Instructions

Technical specification and requirements for the MRI including the annexes listed as below.

Note: For the submission of tenders, each candidate will propose a plan layout of the proposed equipment. The layout will make it possible to check the ergonomics of the rooms by showing the

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effects of handling of the MRI installation requirements. **The implantation and installation layout will be required.**

I.1.1 Objective and Technical characteristics of 1,5 T Magnetic resonance imaging (MRI) :

Expertise France wishes to acquire a 1.5T MRI (magnetic resonance imaging) to meet a need requiring cutting-edge technology (simultaneous multi-slice acquisition, iterative reconstruction, AI/deep learning, etc.). This acquisition will replace the GE Signa MRI, currently in place.

The equipment covered by this contract will be new, of modern design with materials of the best quality. Used or reconditioned equipment is inappropriate and unacceptable.

More specifically, this contract covers the supply, turnkey installation, commissioning (including regulatory checks), updates, maintenance and training in the use of the new MRI.

I.1.2 General technical description

objectives and quantities:

- 1 MRI
- 1 acquisition console offering reconstruction functionalities.
- 1 secondary reconstruction console
- All antennas and all accessories necessary to carry out the explorations described below

The main examinations that will be performed on this device are morphological magnetic resonance imaging examinations, both in adults and children, in the following areas:

- Imaging of the central nervous system for neurological, neurosurgical, ENT and neurovascular pathologies.
- Cardiac imaging.
- Vascular imaging of thoraco-abdominal and peripheral vessels.
- Osteoarticular and muscular imaging.
- Thorax-Abdomen-Pelvis Imaging.
- Whole body imaging.
- Senological imaging.

I.1.3 Minimum Technical specifications:

➤ 1.5 Tesla magnet

The magnet will be of the most recent generation and designed for zero or almost zero helium consumption (Total zero boil-off under normal conditions).

(MRI)L.ST, Full-Body closed system.

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The opening diameter of the magnet must be at least 70 cm. Total bore length with covers ≤ 185

The useful field of view (FOV) at the center of the magnet will be a minimum of 50 x 50 x 45 cm for the XYZ axes.

➤ **RF and gradients**

The system will have a ≥ 32 or independent reception channels used in an acquisition field.

The minimum amplitude of the gradients will be 44 mT/m/axis with a minimum slew rate of 200 mT/m/ms/axis simultaneously.

The power of the transmitter (in KW) ≥ 15 kW.

The system must make it possible to cover the patient (whole body) with surface antennas without repositioning the patient.

Standard strength, z-axis mT/m ≥ 33

Standard slew rate, x-axis T/m/sec ≥ 120

➤ **Examination Table:**

Must be electrically operated. Max Patient weight (including vertical and horizontal movement) ≥ 200 Kg

Minimum table height from floor ≤ 70 cm

➤ **Acquisition console and image reconstruction system**

The offer must include an acquisition solution and a reconstruction and post-processing solution.

Bidders are asked to propose a solution that:

- is complete in relation to the applications requested.
- allows access to 3 users simultaneously.
- The reconstruction speed must be equal to or greater than 25,000 reconstructions per second (matrix 256*256 FFT, full Fov)
- The acquisition console includes the provision of the following peripherals: 2 screens of 19 inches minimum (to allow the technologist to follow his examination on one screen and to perform image reconstructions on the other screen), keyboard, mouse, microphone, intercom (i.e. a complete acquisition console) as well as the software (perpetual licenses) for the visualization and "basic" processing

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of the acquired images (for the technologist who controls the NMR).

- The system has the following modalities: DICOM 3: Storage, Send, Print, Modality worklist. There is a possibility of automated storage of images. A flag indicates the exams/images transferred. The console will have external image storage capacity (CDs, DVDs, USB key).

I.1.4 Medical application and Examination:

The objective is to allow the examinations to be carried out, covering all parts of the body (+ neuropaediatric), knowing the importance of the performance of the antennas/reception system:

❖ **Head and neck**

- Study of stroke, dementia, neoplastic lesions, inflammatory lesions.
- Study of cholesteatomas, mastoiditis and neuromas.
- Compensation for movement and swallowing artifacts,
- Diffusion imaging, perfusion imaging as well as SWI imaging.
- Angiographic and perfusion imaging with and without contrast.
- Dedicated rigid tilting antenna of minimum 16 elements (without antenna combination).
- Detailed study of ATM.
- Head and neck angiographic study.

❖ **Spine**

- Study of disco-radicular conflicts, the medullary canal, neoplastic lesions, degenerative lesions and inflammatory lesions.
- Investigation of the entire column.
- Rigid antenna of minimum 12 elements (without antenna combination).
- Automatic labeling of vertebrae.

❖ **Shoulders in two formats or one adjustable format**

- Study of bone, cartilage, ligaments, muscles and tendons.
- Arthro-NMR analysis.
- Dedicated rigid antenna of minimum 6 elements (without antenna combination).

❖ **Elbows**

- Study of bone, cartilage, ligaments, muscles and tendons.
- Arthro-NMR analysis

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- Antenna of minimum 16 elements/Flex antenna.

❖ Knees

- Study of bone, cartilage, ligaments, muscles and tendons.
- Arthro-NMR analysis.
- Dedicated rigid antenna of minimum 16 elements (without antenna combination).
- The knee antenna is a receiver and transmitter.

❖ Dedicated ankle/foot

- Study of bone, cartilage, ligaments, muscles and tendons.
- Dedicated rigid antenna of minimum 16 elements (without antenna combination).

❖ Dedicated wrist hand

- Study of bone, cartilage, ligaments, muscles and tendons.
- Dedicated rigid antenna of minimum 6 elements (without antenna combination).
- The antenna must be able to be positioned vertically and horizontally.

❖ Fingers

- Study of bone, cartilage, ligaments, muscles and tendons.
- Dedicated antenna with a diameter between 4.5 cm and 7.5 cm.

❖ Breast diagnosis

- Study of prostheses, neoplastic lesions and patients at high risk of breast cancer.
- Sequences adapted to silicone and perfusion imaging.
- Fast sequences with a complete examination in 12 minutes (T2, diffusion, T1 dynamic injection).
- Ultra-fast sequences lasting 3 minutes allowing very early enhancement to be seen (only T1 without and with contrast product); GRE T1w typical sequence of 1 minute for wash out.
- Dedicated rigid antenna only for the diagnosis of minimum 8 elements (without antenna combination).

❖ Heart and thorax

- Heart/thorax antenna of minimum 18 elements (without antenna combination).
- The heart/thorax coil must be able to be connected to the table proximally to the patient's chest and distally.
- Study of cardiac anatomy, cardiac function (cine mode), perfusion, late enhancement (viability).

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- Acquisition allowing flow analysis, mapping T1, T2, T2*
- High temporal resolution angiography.
- Cardiac synchronization via ECG or pulse measurement or other (cardiac triggering).

❖ **Abdomen, pelvis**

- Study of characterization of abdominal mass and bile ducts.
- Study of female genitalia and neoplastic prostate lesions.
- Acquisition of the liver in diffusion, with contrast (4D dynamics) and correction of respiratory artifacts.
- Imaging for quantification of hepatic iron and fat load.
- Acquisition of the prostate in diffusion and with contrast (dynamic).
- Fusion of T2 and broadcast images.
- Fast, high-resolution 4D imaging sequences for multiarterial liver imaging.
- Sequence insensitive to the patient's respiratory movements.
- Antenna must be able to be connected to the table proximally to the patient's abdomen and distally.
- Anterior abdominal antenna of at least 16 elements (without antenna combination).
- Integrated respiratory triggering solution or other.
- 2 body antennas

❖ **Lower limb angiography**

- Study of the arteries of the lower limbs.
- Angiographic sequences without contrast product.
- Lower limb antenna of minimum 32 elements.
- Length of the exploration field is at least 75 cm along the Z axis.

❖ **Whole body Imaging**

- Surface antennas covering the entire body must be able to be connected simultaneously.

The magnetic resonance will also be equipped with an antenna detection system which is located in the Field of View with automatic or manual activation of this at the operator's choice.

The most efficient TE, TR, Echo Spacing and b-value Diffusion are expected

- **Ultra-accelerated imaging**, the offer will therefore offer simultaneous multi-slice acquisition (EPI and TSE) and iterative reconstruction 3D TSE, 4D T1 gradient echo, TOF.

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- **A more detailed analysis**, via the presence of the latest technologies based on AI and deep learning. The bidder will detail the advantages of this system.
- The maximum number of options modifying image contrasts (FLAIR, IR, STIR/FS, MTC, IP-OP), increasing the speed of sequences (TSE, EPI, etc.) and reducing artifacts.
- **A thorough diagnosis**, due to the presence of special imaging techniques, notably cardiac MRI (function, flow, T2 and T2*map, late enhancement quantification, T1 Map, ECV); presence of software management of whole body and total spine examinations (intelligent reading, stitching, fusion of diffusion/other sequences, labelling of the vertebrae); presence of complete oncological monitoring (multimodality, automatic 3D registration, visualization of statistics and volumes, temporal histogram); multi-organ spectrographic imaging (head, prostate, etc.); presence of advanced free-breathing techniques allowing 4D type acquisitions for dynamic liver imaging with precise detection of the arterial phase; presence of non-contrast imaging (kidneys and neck for CKD) and non-contrast perfusion.
- **Patient safety and comfort**, via the presence of a media broadcast system (image and sound) and the detection of the patient's breathing without a chest belt and whatever the direction of introduction of the latter; a tunnel video surveillance system with two-way communication and systems facilitating patient positioning (automatic positioning and automatic centering of the patient). To promote patient comfort, a tunnel with a length less than the entire body is expected in order to leave the patient's head free and thus avoid the effects of claustrophobia when the type of examination allows it.
- **Ease of use**, notably via the presence of a removable height-adjustable table and a control station with two screens.

Scanning Techniques:

- Spine echo (SE): Yes
- Inversion recovery (IR): Yes
- Fast Gradient echo with preparation pulse or turbo: Yes
- Puls or turbo: Yes
- Multi-echo with identical phase- encoding for the whole echo train and automatic combination of the echoes to minimize flow artifacts and chemical shift artifacts: Yes
- Dual- echo acquisition, double echo steady state: Yes
- Echo steady state constructive interference in steady state: Yes
- Turbo spin echo pr fast spin echo (TSE or FSE): Yes

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- Diffusion imaging advanced head and Body: Yes
- Echo planar imaging EPI: Yes
- Turbo Inversion Recovery Single- shot TSE: Yes
- **Imaging acquisition**
 - Patient movement compensated head: Yes
 - Patient movement compensated body: Yes
 - Automated real- time prospective motion detection and correction shall be included, 1D motion detection and correction, 2D motion detection and correction isotropic 3-D T1: Yes
 - Isotropic 3-D fast spin echo T2: Yes
 - Water contrast: Yes
 - Fat contrast: Yes
 - Phase contrast: Yes
 - MARS (metal artifact reduction sequence): Yes
 - Fat-suppressed single breath- hold body imaging: Yes
- **Gradient echo**
 - Spoiled techniques: Yes
 - Rewound techniques: Yes
 - Steady state free precession: Yes
 - Inversion recovery: Yes
 - Magnetic transfer contrast: Yes
 - Magnetic susceptibility image: Yes
 - Breast imaging with fat suppression: Yes
 - ECG gated: Yes
 - Respiratory gating: Yes
 - Contrast enhanced imaging: Yes
 - Extremity contrast enhanced imaging: Yes
 - Diffusion imaging: Yes
 - Whole body diffusion and whole body MRI with automatic composing for 200 cm: Yes
 - Diffusion tensor imaging: Yes
 - Prefusion imaging, head: Yes
 - Prefusion imaging, body: Yes
 - Spectroscopy (single voxel multi voxel): Yes
 - Function imaging neurological: Optional
 - Cardiac imaging: Yes
 - Cardiac morphology: Yes
 - Cardiac perfusion: Yes
 - Cardiac cine: Yes
 - Cardiac late enhancement: Yes
 - Other standards: Yes

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- **Non-contrast angiographic imaging**
 - Time of flight: Yes
 - Phase contrast: Yes
 - SSFP or PSIF: Yes
- **The following application shall be included:** Neuro imaging, MR angiography, cardiac imaging, body imaging, whole body imaging, breast imaging, orthopaedic imaging, oncological imaging, paediatric imaging.
- **Real time display:** the possibility of automatically displaying images immediately after reconstruction shall be included.
- **Workstation quantitative image analysis tool**
 - Perfusion imaging: Yes
 - Diffusion Imaging: Yes
 - Body imaging: Yes
 - 3-D image reconstruction: Yes
 - Cardiac imaging: Yes
 - Other standard: according to manufacture (should be specified in details)
- **Control console**
 - Graphic user interface: Yes
 - Artificial intelligence: Yes
 - Automated slice positioning for brain, spine, knee, and shoulder: Yes
 - Workflow efficiency features: Yes
 - Remote access: Yes
 - Remote control: Yes
 - Protocol-sharing tools: Yes
 - Parameter adjustment aides: Yes
 - respiratory gating: Yes
 - Automatic patient voice instructions with the ability to record new instruction: Yes
- **Smart UPS for all system including the chiller:** 160 KVA continues supplying technique

I.1.5 Installation, connection and implementation

The installation will be turnkey and will include, in particular:

- The work of fitting out and finishing the room
- The transfers and delivery of the entire equipment
- The Faraday cage: adaptation or replacement if necessary successful

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bidder will have an obligation of result for optimal functioning of the RMN

- Coordination of the site in agreement with the Expertise France (a start-up meeting will be organized after the award of the contract so that all parties approve the schedule and the work to be carried).
- Installation and configuration for optimal commissioning and operation, in compliance with the requirements provided for, the performances mentioned in the offer, the regulations and the rules of the art for this field of activity (in particular, the manufacturer's recommendations, the RGIE requirements for electrical installations – in particular in the context of technical note T013/A relating to premises for medical uses)

I.1.6 Completion of the premises:

regarding Infra, MEP and architectural works and Radio attenuation will be in accordance with the specifications of the proposed equipment. See Annexes The service includes in particular:

- shielding of walls, ceiling and floor,
- adaptation of the cage to existing networks (medical fluids, electricity, chilled water network),
- the removable panels allowing the delivery of the magnet,
- the observation bay (minimum dimensions: 1m50 wide by 1m high),
- the armored sliding door (lead, RF standards, etc.), providing access to the MRI room,
- the technical penetrations through the cage and the necessary filters (radio frequencies for electrical penetrations, wave guide to the control room, passage of ventilation ducts),
- the Quench line if the existing one could not be used,
- A plan and section view of the installation will be sent with the offer. The bidder Will include the Iso Magnetic liens.

Description of the Works:

Finishing the room: all repairs to existing walls, patching of floors or ceiling slabs, linked to the possible dismantling of the Faraday cage, are the responsibility of the successful bidder.

Wall finishing if new cage needs to be installed: similar to the existing one.

The floor covering: will be of heterogeneous PVC type, meeting the standards and classifications in force as well as the raised plinths, around the perimeter of the room, in the same material and measuring 10cm/ 10cm.

Lighting: an LED type light strip, with variable intensity, will be placed around the perimeter of the room, as well as “backlit pattern” type lighting of approximately 180cm x 120cm above the table, also variable intensity.

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The armored door: it will be of the sliding type (leaded, RF standards, etc.), motorized, of sufficient width for the passage of non-magnetic stretchers.

Armored glass: it will be in the same place as currently and of identical dimensions.

Internal signage: pictograms to place.

The successful bidder is required to carry out a check of the effectiveness of the attenuation of the FARADAY cage, before installing the equipment to allow any possible modifications. Upon commissioning, it will carry out a radiofrequency measurement test as well as an acoustic study in the premises adjacent to the MRI room. Any necessary adaptations following the completion of these studies are the responsibility of the successful bidder. The documents attesting to the completion of these studies and their results will be an integral part of the file submitted to Expertise France.

I.1.7 Objective Standards and Regulations

Standards and regulations

Medical devices, their components, and the services provided must comply with all applicable standards and regulations mentioned in this section on the date of contract signature, as well as those applicable at the time of final acceptance of equipment and services:

- ISO 13485:2003 Medical devices -- Quality management systems -- Requirements for regulatory purposes (Australia, Canada and EU)
- ISO/TS 10974
- IEC 60601-2-33

CE marking

All equipment, peripherals, accessories and consumables will comply with the regulations relating to Directive 93/42/EEC.

The installation must be in accordance with standards and all the regulations in force (hygiene, machine safety, electrical safety, etc.).

Each medical device and pressure device will be accompanied by CE declarations and CE type-examination certificates with the limit of validity and recurrence of controls.

FDA clearance (Preferred) and ISO certificates

The required certificates are to be provided.

I.1.8 Objective Associated maintenance contract and guarantee:

Guarantee:

- The Tenderer's offer will specify the exact duration of the guarantee (**minimum 2 years**).

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- The starting point of the guarantee period is the date of commissioning of the equipment as stated in the decision to accept the equipment.
- Interventions lasting more than two working days carried out during the warranty period, postpone the term of the warranty accordingly
- The Tenderer will provide full maintenance coverage "parts, labor and travel" for the entire warranty period.
- The Tenderer will clearly specify, if necessary, the exclusions or the limits of guarantee.

Warranty maintenance:

Preventive and corrective maintenance and regulatory performance checks are carried out by the contractor during the specified warranty period, in accordance with the manufacturer's recommendations.

The Tenderer will indicate the assumption of responsibility for the preventive maintenance during the duration of the guarantee.

Out-of-warranty maintenance:

The Tenderer will specify in his offer the elements relating to the support of out-of-warranty maintenance with an offer including:

- Training of the technical team in curative and preventive maintenance of equipment.
The equipment and conditions of realization necessary for a support by the maintenance service of MRCC.
- labor, parts (excluding consumables) for support by the supplier's after-sales service, for maintenance from level 2.

The services are carried out in partnership with the technical staff of the Biomedical department of the **MRCC medical centers** according to their availability. However, MRCC reserves the right to involve the contracting party if necessary. The Tenderers will indicate in his offer the amounts relating to this type of intervention.

I.1.9 Applications and post-processing solutions – hardware and software:

The following software applications will be included:

- All the classic 2D and 3D acquisition sequences (gradient echo, spin echo, inversion recovery, etc.) and saturation techniques for removing fat, water and silicone.
- Ultra-fast acquisition sequences.
- Parallel acquisition sequences.
- MR angiography sequences with and without injection (time of flight, phase contrast, etc.).
- Diffusion and perfusion imaging.
- Cerebral perfusion without and with contrast,

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- Tractography.
- Spectroscopy applications.
- Multimodality fusion: MRI, CT, PET, US and intra-modality fusion: anat+DTI.
- Calculation of B values in diffusion.

For all software offered, a detailed description of the functionalities will be provided. The bidder has complete freedom to propose other software adapted to the themes described, including possible precise software suites that are neutral from the manufacturer's point of view allowing the fusion and comparison of multimodal images.

An image composition system is required (total spine, total body, Angio and total abdomen reconstructed in a series of images).

The bidder must propose a solution that integrates into the existing Syngo Via post-processing solution or propose a suitable solution. This involves guaranteeing all post-processing functionalities of the images produced throughout the life of the equipment. Bidders therefore undertake to supply, install and maintain at no additional cost all their own post-processing elements enabling them to guarantee the post-processing of images which are not supported by the third-party system to which they refer in this market.

I.1.10 Connection to the network: traceability and archiving:

The bidder must guarantee complete and efficient integration into the hospital's PACS network and the DICOM network of post-processing software as well as guarantee full compatibility with commonly accepted DICOM standards and patient list management (DICOM WORKLIST). The link with the PACS will be at the expense of the bidder. The detailed "DICOM compliance statement" document will be provided.

The proposed system must be DICOM-compatible to be able to connect to the hospital's existing network and allow, in particular, the import of patient administrative data and the export of images to other modalities and PACS.

The different levels of DICOM format interfaces with implementation of the following service classes are required as Service Class User (SCU) and Service Class Provider (SCP):

- DICOM storage
- DICOM Storage Commitment
- DICOM Print Class User
- DICOM Query/Retrieve

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- DICOM Modality Worklist
- DICOM Modality Performed Procedure Step
- DICOM structured reporting
- DICOM Exchange Media

Any computer cabling and communication equipment (switch, etc.) necessary for communicating the elements of the installation will be included in the basic offer.

Annexes:

- 1- **Annex 1 price schedule MRI 1.5 T.**
- 2- **ANNEX 2 MRI and Accessories Technical Specification.**
- 3- **Annex 3 MRI MEP Requirement.**
- 4- **Annex 4 MRI Room layout.**
- 5- **Annex 5 Chiller Specification.**
- 6- **Annex 6 RF Cage and shielding parameters and Requirements**