S.N. RADIOCOMUNICAȚII S.A.
INTRARE REGISTRATURĂ
IEȘIRE 301/11648/14.10.2022

APPROVED

TECHNICAL EXECUTIVE DIRECTOR

Doina Violeta MICU

SOCIETATEA NAȚIONALĂ DIRECTOR EXECUTIV TEHNIC 2 RADIOCOMUNICAȚII S.A.

TECHNICAL REQUREMENTS

FM TRANSMITTERS IN ACTIVE STAND-BY CONFIGURATION AND FM BAND PASS FILTERS

CPV code: 32210000-8 Radio and television equipment (Rev. 2)

Full solide state FM-VHF transmitter 2+1 @ 1kW: 7 pcs
Full solide state FM-VHF transmitter 2+1 @ 0,5kW: 1 pcs
Full solide state FM-VHF transmitter 1+1 @ 1kW: 7 pcs
FM band pass filter : 13 pcs

Broadcasting Department

Radio Broadcasting Chief Engineer

Lorena TALPAN

Bucharest, 2022

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CIF: RO10881986

Capital Social subscris și vărsat:
193.486.918,66 lei

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1. INTRODUCTION

In this procedure, that will be concluded by signing a product supply contract, Romanian National Radiocommunications Company S.A. (S.N.R. S.A.) performs the role of Contracting Authority, respectively beneficiary of the contract.

The tender specifications are an integral part of the procurement documentation and constitute the minimum set of technical and quality requirements to be fulfilled, on the basis of which each bidder will elaborate the technical and economic proposal, in order to conclude the contract for the supply of products. Any annex corresponding to any chapter of this tender book, is an integral part of that chapter and implicit of the procurement documentation.

Technical offers / proposals that do not meet all the minimum requirements, specified as such in the specifications, will be declared non-compliant. **Partial tenders, in terms of quantity and quality, are not admissible,** only full tenders that meet all the requirements set out in this tender book will be declared admitted. **Alternative offers are not accepted.**

Any tender which deviates from the mandatory minimum requirements will be considered admissible only in so far as it ensures a higher quality level than the minimum requirements.

The documentation related to the technical proposal will be presented in English or in Romanian and will be submitted in electronic format, with text search capability. In case of submission the technical proposal in English, the bidder assumes the obligation to submit, at the request of SNR S.A., the authorized translation into Romanian language.

In the case of english technical terms and their usual acronyms, as well as those which do not have officially equivalent accepted in the Romanian language, the semantic value retains their original technical meaning (according to specifications and definitions in the terminology used by reference structures in the field of communications) throughout the description of the technical specifications in this tender book.

In this document will be used the terms ***Bidder*** and the terms ***Contractor or Supplier***, which will have the same meaning. The terms ***Product Supply Contract*** and ***Contract*** will have the same meaning.

2. PRODUCTS PURCHASE INTENTION CONTEXT

2.1. Information about the Contracting Authority

Name of the Contracting Authority: Societatea Națională de Radiocomunicații S.A. (S.N.R. S.A.)
Address: Șoseaua Olteniței nr. 103, sector 4, București.

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2.2. Information about the context that led to the purchase of the products

According to the provisions of H.G. nr. 372/1998 on the establishment of the Romanian National Radiocommunications Company S.A. through the reorganization of the Autonomous Administration " Radiocomunicații ",Societatea Națională de Radiocomunicaţii (S.N.R.) S.A. is a legal Romanian entity, a national company of public interest, which operates on the basis of economic management and financial autonomy.

S.N.R. S.A. provides telecommunications services with a wide range of coverage and addressability. In order to achieve the purpose for which it is established, S.N.R. S.A. exercises its object of activity throughout the country and outside it, ensuring the transport and broadcasting of national radio and television programs, international radio and television programs, and other radio and television programs.

Romanian National Radiocommunications Company S.A. is the main provider of radio-tv broadcasting services (analog and digital), which deals with the transport and broadcasting of public radio and TV programs of the Romanian Radio and Television Broadcasting Companies at national and international level, through the largest network of DVB-T2, FM, AM and US transmitters.

Within the FM broadcast network of S.N. Radiocomunicății, several types of FM transmitters are in operation, and in the 0.5 kW-1 kW power group are the Quest type ones, which were put into operation in the period 2003-2004. These transmitters are part of a range of equipment with technology from the 1990s, and due to their age, some of the components can no longer be procured. For example, in the Huși and Vaslui sites, the transmitters had to be replaced with available spare transmitters, because their functioning became unstable and after repeated attempts to fix it, normal operation could not be restored. At Hotarele site, a good part of the electrical wiring of the transmitter was damaged by rodents, the operation being unsafe, with repeated blocking situations, random power loss, etc.

Although they are in dual exciter configuration, with automatic change over in case of failure of the main exciter, some of them no longer have this functional facility due to the fact that the switching control system is no longer working, and this component (Main Alt Controller) is " obsolete" (old component, which can no longer be used), according to the information received from the manufacturer.

As mentioned above, these equipments incorporate outdated technology from the 1990s, and the procurement of specific spare parts from the manufacturer is difficult or even impossible for certain items. Because of this, the transmitters are no longer functional at normal capacity (nominal power, technical parameters) or they no longer have the redundancy of critical components such as the exciter. The system of automatic switching in case of failure is non-functional in many of them, which no longer allows transmitter to be on air in case of failure of the main exciter.

Another aspect related to the limitations of this type of equipment is the fact that it does not have the possibility of remote monitoring/access. Because these transmitters are installed in remote locations that are not manned, difficulties arise in ensuring prompt interventions in the event of a failure. In addition, there is also the unpleasant situation that, due to the fact that there is no information about the functionality of the equipment, there are long-lasting failures, and intervention is only started after notifications or complaints being received directly from listeners or sent to Romanian Radio Company, or if any of the intervention teams have other works in the area.

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The contract signed with Romanian Radio Company includes the broadcasting of Romania Actualitati and Romania Cultural programs through two networks with national coverage consisting of 116 transmitters (0.5 kW-10 kW). These networks include 23 Quest transmitters (21x1 kW transmitters and 2x0.5 kW transmitters). Taking into account the fact that the majority of Quest transmitters are in remote locations, we consider it appropriate to adopt a technical solution with active back-up, respectively: 1+1 (a main transmitter + a transmitter active bsck-up) or 2+1 (two main transmitters + one active backup transmitter).

2.3. General framework of the Contracting Authority activity sector

S.N.R. S.A. carries out its activity in the field of radiocommunications, the main object of activity including: the provision and marketing of communications services, maintenance, operation, development and modernization of the national system of terrestrial broadcasting for public radio and television programs, the delivery, under the law, of radiocommunications services necessary for operating the national security system.

Activity of S.N.R. S.A. is carried out in accordance with the provisions of:

- **H.G. no. 372/1998** on the establishment of S.N. Radiocomunicații S.A. through the reorganization of the Autonomous Radiocommunication Directorate;
- **Law nr. 504/2002** of the audiovisual services, with subsequent amendments;
- **O.U.G. nr. 111/2011** on electronic communications, with subsequent amendments;
- **Law nr. 159/2016** on the regime of physical infrastructure of electronic communications networks, as well as for establishing measures to reduce the cost of deploying electronic communications networks, with subsequent amendments and additions;
- **O.U.G. nr. 109/2011** on corporate governance of public enterprises, with subsequent amendments.

3. DESCRIPTION OF REQUIRED PRODUCTS

3.1. The general objective of required products

The object of the Contract is to purchase **23 Full Solid State FM transmitters in active reserved system with a 2+1 / 1+1 configuration and 13 FM Band Pass Filters**, to replace the existing ones that no longer correspond from a technical and functional point of view.

NOTE: the supply of the products will also include training in factory, factory acceptance testing, on-site acceptance testing of the products after installation by the Contracting Authority.

3.2. Required products and ancillary operations to be performed

In the performance of the contract, the contractor's activity shall be guided by the following **principles**:

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- The contractor shall act in the interest of the Contracting Authority throughout the duration of the contract, under the conditions and within the limits described in the documentation relating to this procurement procedure;
- The contractor shall act in order to achieve the objective, with regard to optimising the use of resources in order to achieve the objective of the contract.

3.2.1. Requested products

Delivery of the products will be made at the following **locations**:

No.	Location	Delivery address
1	ALEXANDRIA	Str.Calea Dunarii nr.145, site ROMTELECOM, jud.Teleorman
2	BORSEC	Varful Teasc, Borsec, jud.Harghita
3	BRAŞOV-TÂMPA	Varful Tampa, Brasov, jud.Brasov
4	DĂBULENI	Str.Marin Preda nr.4, Dabuleni, jud.Dolj
5	GIURGIU	Bdul Mihai Viteazul nr.1, Giurgiu, jud.Giurgiu
6	HOTARELE	Com.Hotarele, jud.Giurgiu
7	MAHMUDIA	Deal Bestepe, Com.Mahmudia, jud.Tulcea
8	MOLDOVA NOUĂ	Pojejena, jud.Caras Severin
9	NEGREŞTI	Varful Jelcznic, Negresti-Oas, jud.Satu Mare
10	SIGHET-FM	Dealul Dobaies, Sighetu Marmatiei, jud.Maramures
11	VĂRATEC	Varful Varatec, Baiut, jud.Maramures
12	VASLUI	Dealul Mirenilor, Com.Tanacu, jud.Vaslui
13	HUŞI	Deal Dobrina, Husi, jud.Vaslui
14	SLOBOZIA	Str. Unirii nr.4, Slobozia, jud. Ialomița
15	SULINA	Str. Mircea Vodă nr.1, Sulina, jud. Tulcea
16	Sucursala DRc.BUCUREŞTI	Str. Carpați nr.100, sector 1, București
17	Sucursala DRc. IAŞI	Str. George Enescu nr.7, Iași, județ Iași
18	Sucursala DRc. TIMIŞOARA	Str.Aristide Demetriade nr.1, Timișoara, județ Timiș
19	Sucursala DRc. CLUJ	Str.Fagului nr.2, Cluj Napoca, județ Cluj

The delivery Time is maximum 12 **months**, from the date of signing the contract.

The technical warranty of the products shall be at **least 24 months** from the date of the Final Acceptance Report *and the certificate of acceptance on the* site, as specified in point 3. 2.2. Warranty.

The products covered by the supply contract have the following technical characteristics:

- **Full Solid State FM transmitters active reserved system in 2+1 / 1+1 configuration**

The new equipment that will be installed will be of the latest generation, completely solid state (transistorized).

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It will be provided:

- 1+1 active reservation system (one main transmitter + one active backup transmitter) or 2+1 (two main transmitters + one active backup transmitter) and bandpass filters to limit unwanted parasitic emissions.
- Local monitoring framework and remote access interface
- Spare parts - minimum recommended set*: set of electronic modules and other components that the manufacturer considers necessary for the quick removal of failures and minimizing downtimes.
- For sites where there are at least two transmitters, bandpass filters will be provided for the transmitters that are connected to the broadband input of the combiner or directly to the antenna.
- All equipments must be CE compliant.
- Delivery to broadcast stations.
- The transmitters will have the following main features:
  - Exciter with digitally controlled oscillator and digital modulator (direct to channel)
  - The transmitter will be provided with a microprocessor control system and modern user interface with LCD display and will include all the necessary facilities for integration into Radiocom's remote monitoring system
  - The transmitters will be equipped with sound processor, RDS encoder

Technical specifications of the transmitters:

Frequency range	87.5 ÷108 MHz software digitally programmable
Frequency stability	+/-150Hz
Nominal frequency deviation	± 75 kHz (CCIR 450 - 1)
Modulation capability	± 150 kHz;
Class of emission	F8EH
Stereo emissions	According to CCIR recommendation 450, section 2 (pilot tone procedure)
Output impedance	50 Ω (Unbalanced);
VSWR	Automatic power reduction beyond 1.5:1, Transmitter should be protected for short and circuit conditions
Spurious emissions (including harmonics) a. 9kHz-1GHz b. 108 MHz-137MHz	according ETSI EN 302 018 max -16dBm (25microW) for tx 1kW better than -75dBc for tx 150W-500W max -16dBm (25microW)
Modulation frequency range	30 Hz la 15 kHz;
Input impedance	600 ohms, balanced for analog 110 ohms for digital
AF input level	0 dBu to + 10 dBu for analog - 10 dBFS to 0 dBFS for digital;
Stereo Amplitude Response referred to fmod=400 Hz, 30 Hz to 15 kHz,left channel, right channel	± 0.2 dB (without pre-emphasis) ± 0.2 dB (with pre-emphasis)

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Crosstalk between left and right channels, 100% modulation, 30 Hz to 15 kHz	> 60 dB
Distortion (THD) 30 Hz - 15 kHz, left channel, right channel	
- with 75 kHz frequency deviation	< 0.05%
- with 100 kHz frequency deviation	< 0.05%;
Intermodulation distortion (L , R) 60Hz/ 7kHz, 4:1, +4dBu	< 0.2%
FM S/N ratio, referred to fmod=400 Hz at 75 kHz frequency deviation,peak value measurement, left channel, right channel, -weighted	≥ 80 dB
Asynchronous AM Noise	> 55dB
Synchronous AM Noise	> 50dB
Supply voltage	230Vac ± 15%, 50 Hz ± 3 Hz
Overall efficiency	> 65% pt Tx < 1kW > 70% pt Tx = 1kW

Technical Specifications of FM Band Pass Filters

Type	Min 3 cavities
Frequency range	87.5 MHz – 108 MHz
Impedance	50 ohms
Power	1kW
Frequency	According to the frequencies specified in quotation list
Selectivity	Selectable +/-1.2MHz to +/-1.6MHz
VSWR at fc	<1.08
Insertion loss	<0.5dB, selectivity +/-1.6MHz
Cooling	Natural heat dissipation

Legend:

Spare parts - the minimum recommended set*- The bidder shall provide a complete list of the recommended spare parts for the post-warranty period and their price per unit. The total value of the recommended set of spare parts will not exceed **5% of the value of the transmitter**.

The technical characteristics of full Solid State FM transmitters active reserved system in 2+1 / 1+1 configuration and FM Band Pass Filters that are the object of the contract, can be found in the technical proposal forms Annex 1 to this specification, respectively **Annex 1a- Technical compliance for for Full solide state FM Transmitter** and **Annex 1b- Technical compliance for for FM Band Pass Filters**.

3.2.2. Warranty

The products/ equipments delivered under the contract benefit from the warranty and technical support period assumed by the Supplier in the bidding process, **of at least 24 months** from the date of signing the final reception protocol and the certificate of acceptance on site, without any additional cost for the Buyer.

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During the warranty period, the Contractor shall notify the Supplier within 5 days from the date of finding a malfunction, and the Supplier undertakes to repair or replace at its exclusive expense, any defective component or subassembly, including any installation material that is found to be defective or non-compliant with the technical specifications, within a maximum of 10 days from the date of notification by the Purchaser. The replaced components will have a new warranty period, which runs from the date of their replacement.

The Supplier must provide qualified service personnel capable of providing technical support and managing the fixing of the failures during the warranty period.

3.2.3. Delivery, packing, labelling, transport, and insurance during transport

The supplier shall be obliged to **pack the products** in such a way as to cope with its handling at loading/unloading, the conditions during transport, transit and exposure to extreme temperatures, sun and precipitations that may occur during transport and storage, so as to reach its final destination in good condition, according to the manufacturer's specifications. In the case of packing weights and volumes in boxes, the supplier shall take into account the distance to the final destination of the products.

The products will be labeled and packaged according to the provisions of the execution standards, by category (e.g. transmitters, power suplies, monitoring equipment, installation materials, FM band pass filters, etc.) in separate packages. On each package, a label containing the type of equipment contained will be displayed in a visible place. If a category of equipment is contained in several packages, the Supplier must highlight this fact and make the correlation between these packages (e.g. by numbering them).

All packaging materials for the products, as well as all the materials necessary for the protection of the packages (wooden pallets, protection sheets, etc.) remain the property of the Purchaser.

The products/ equipments will be delivered to the sites mentioned in point 3.3.1., and ***their installation will be carried out by the Contracting Authority***. The supplier has the obligation to communicate to the Buyer, in writing, 5 days before the dispatch of the products, the shipping dates, the description of the products, the quantity. The supplier shall send to the Buyer the following documents that will accompany the products:

- Cargo accompanying notice;
- List of products contained in each package (Packing-list);
- The quality certificate;
- Warranty certificate;
- Transport document (car, sea, etc.);
- Certificate of origin of the goods;
- The factory acceptance certificate, signed by the representatives of both contracting parties.

The products will be insured against loss or damage occurred during transport and caused by any external factor, the Supplier being fully liable for any damage/ malfunction of the products occurred during transport, the latter having the obligation to remedy any deficiency occurred, possibly to replace, if necessary, the damaged / defective product according to the contractual provisions on the technical warranty.

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The Supplier shall be responsible for the delivery of the products within the agreed time limit and shall be deemed to have taken into account all the difficulties which he may encounter in this respect and shall not invoke any reason for delay or additional costs.

3.2.4. Auxiliary operations

3.2.4.1. Training of Contracting Authority staff for product testing and operating

The contractor is responsible for the training of the personnel designated by the Contracting Authority, respectively the schooling in **the factory of a number of 6 persons, during 5 working days**, in order to test the technical parameters of the equipment in the factory and on the site, after installation and for the subsequent operation of the product / equipment.

The training activity will be provided at no additional cost to the Buyer. **The provider will cover all costs of the training**, including those related to **travel and accommodation.**

The technical training activities will be carried out by instructors authorized by the manufacturers of the transmitters and on their equipment; the training shall be carried out at the manufacturer's premises or in facilities approved by him, equipped in accordance with the purpose of the training.

Prior to the start of the training activities, the Tenderer has the obligation to elaborate and make available to the Buyer, in electronic format, ***technical-operational documentations, manuals for exploitation, administration and use in English or Romanian***, for all the functionalities of the product and its equipment. The participants in the training will be provided individually with training materials on electronic and printed support. After completing the training, diplomas / certificates of participation / attestation will be issued for all participants.

3.2.4.2. Installation and commissioning

The on-site installation of the supplied products, **will be carried out by the Buyer**, under the coordination of the personnel trained by the Supplier for this purpose.

Upon completion of the installation of the transmitters on the site, the Buyer shall notify the Supplier in order to carry out, within a maximum of 15 days from receiving the notification, **the on-site acceptance testing of** the products and **their commissioning**.

3.2.4.3. Testing products and accessories

Testing of the full solide state FM transmitters, accessories and a FM band pass filters will be done **in the factory** and **on site**.

The products testing will be carried out in the presence of the Authorized Representatives of the Supplier and the Beneficiary's staff, trained by the Supplier in this scope.

The Contracting Authority proposes **to fill in the test results** in forms of the kind provided in **Annex 3a and Annex 3b** to this specification.

Note: It is mandatory that the submitted offer contains a detailed "*Acceptance Test Protocol*", including the individual procedure and test equipments used to measure and test each parameter and functionality of the transmitters.

The factory testing of the transmitters will be carried for one transmitter from each power range (2+1 FM 1kW, 2+1 FM 0.5kW, 1+1 FM 1kW), out *on dummy load.* Performance testing involves

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operation checks, electrical and mechanical checks, testing the operating regime,according to the protocol . At the end of the factory testing, the **acceptance certificate** will be issued, a document that will be signed by the representatives of the Beneficiary and of the Supplier.

On-site testing involves repeating factory tests on dummy load. **All tests will also be repeated in the antenna.**

Accessories testing

The related equipment will be tested and inspected according to the mutually acceptable acceptance testing protocols at the manufacturer's factory as well as on site. The bidder shall attach to the submitted bid, *the acceptance protocol for each type of equipment*.

3.2.4.4. Technical support and preventive maintenance during the warranty period

Throughout the duration of the contract, the Supplier shall provide **technical support**. It will provide a contact point dedicated to the Buyer, where the latter can report any problem / malfunction that requires maintenance, in order to ensure that any reported situation is promptly handled by the Supplier.

Maintenance during the warranty period, of **at least 24 months**, will be provided by the Supplier, at his expense, including the provision of the necessary spare parts from its own stock. The warranty for the product(s) repaired or replaced during the warranty period is extended by the duration of their immobilization in repair.

3.2.4.5. Spare parts for corrective maintenance program activities after warranty period

The supplier will ensure a stock of first intervention spare parts, within the limit of 5% of the value of the product / equipment, parts that will be ***delivered together with the equipment*** and will be made available to the Buyer for **use during the post-warranty period**, in order to remedy with maximum urgency some possible problems.

The supplier must be able to provide spare parts and any other necessary consumables. Thus, the Bidder shall present in the proposal:

a) **Recommendations regarding the spare parts** that must currently exist in order to facilitate the shortest possible time of the maintenance operations;
b) **The delivery time** for the recommended spare parts, within the limit of 5% of the value of each product / equipment, is the same as the delivery term of the product;
c) The way of insuring the avalability of spare parts during the post-warranty period;
d) Other relevant information.

All spare parts provided by the Supplier must comply with the technical and quality requirements of the equipment manufacturer.

3.3. Duties and responsibilities of the Parties

- **Duties and responsibilities of the Provider**

- To provide products up to the standard and performance presented in its technical proposal, with the professionalism and promptness due to the commitment made;

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- To inform the Buyer 5 days before the delivery of the product, in writing, by sending the documents that will accompany the product on delivery;
- To supervise the delivery of the product and the provision of related services, to ensure the human, material, equipment or other similar resources required by and for the contract;
- To ensure all activities regarding the training of the designated personnel of the Buyer;
- To check the product on departure from the factory and to ensure the proper packaging and labelling of this, according to the requirements of the specification;
- To ensure the transport of the product to the destination and the unloading of the product on site, under conditions of maximum safety;
- To insure the products during transport s;
- To deploy together with the Contracting Authority the verification / testing of the product - acceptance tests in the factory and on the site, after its installation by the Contracting Authority, within a maximum of 15 days from the receipt of the notification on the completion of the installation works, issued by the Contracting Authority;
- To provide the spare parts within the limit and the technical specification established by the contract (max. 5% of the valueof the product / equipment); their delivery will be made together with the transmitter;
- To provide technical support and free maintenance during the warranty period, to remedy within 10 days the failures notified by the Buyer;
- To solve without additional costs for the Buyer, within a maximum of 10 days from the notification of the Buyer, any inconsistency found after the quantitative acceptance, including in the case of inspected or tested products, both in the factory and on site, which do not comply with the technical specifications of the Supplier's technical proposal;
- To ensure, at the request of the Purchaser and at a reasonable price, the spare parts, materials and subassemblies necessary for the proper functioning of the delivered equipment, for a period of 10 years from the end of the contract. If during the 10 years, certain spare parts are no longer produced, the Supplier has the task of purchasing the Buyer the equivalent spare parts, at current and reasonable prices, charged on the market and accepted by the Buyer.

- **Duties and responsibilities of the Buyer**

- To make available to the Contractor any information and/or documents which he holds and which may be relevant to the performance of the contract;
- To designate a representative responsible for the monitoring and performance of the contract;
- To ensure the access of the Supplier to the site mentioned in this specification, in order to unload the product in conditions of maximum safety;
- To quantitatively receive the product within 5 days of its delivery on the site and to sign a quantitative reception report of, that will be aproved by both contracting parties;
- To install the product within 5 working days from the quantitative reception report and to notify the Supplier at the end of the installation of the product on the site, in order to carry out the acceptance tests within the stipulated time, together with the Supplier;
- To carry out the qualitative reception in the presence of a representative of the supplier and to draw up a performance test report, which will be signed by both contracting parties;
- To request technical support from the Supplier, under the conditions set out in the specifications and in the contract;

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- To notify the Supplier within the warranty period of the product, within 5 days from the occurrence of a malfunction, in order to remedy it;
- To pay to the Supplier the price agreed for the fulfillment of the contract, based on the invoice issued by him, accompanied by the Protocol of quantity and quality reception, and by the certificates of acceptance in the factory and on the site, without observations, under the conditions mentioned in the contract.

4. DOCUMENTATION TO BE SUPPLIED TO THE CONTRACTING AUTHORITY RELATED TO THE PRODUCTS

The products covered by this specification shall be compulsorily delivered together with the following documents:

a) The notice accompanying the goods;
b) List of products contained in each package (Packing-list);
c) The quality certificate;
d) Warranty certificate;
e) Transport document (car, sea, etc.);
f) Certificate of origin of the goods;
g) Technical documentation, according to the specifications;
h) Acceptance certificate, following factory testing of the product, signed by both contracting parties.

5. RECEPTION OF PRODUCTS

The final reception of the products will be made at the final destination and will include cumulatively:

a) **The quantitative acceptance,** which will consist in the inspection and visual verification by the Purchaser, counting of the products delivered, including the auxilliary components (it is mandatory to record all the series of the delivered products) within 5 working days of their receipt and a quantity reception report will be concluded, which will be signed by both contracting parties.
b) **Qualitative acceptance**, which will involve carrying out **conformity tests** in order to verify compliance with the technical specifications of the product in the technical proposal.

If, during the quantitative and qualitative acceptances, it is found that not all the components of the product have been delivered, or some of the components tested by the Purchaser do not meet the technical specifications of the technical proposal or are defective, the Buyer has the right to reject the products concerned, and the Supplier has the obligation to remedy the deficiencies found, without additional costs for the Buyer, by delivering within a maximum of 10 working days the missing product/components and/or replacing them, without exceeding the set deadline.

6. PAYMENT TERMS AND CONDITIONS

The payment of the delivered products will be made based on the invoices issued by the Supplier, by bank transfer to his account, according to the provisions of the Contract.

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7. METHODOLOGY OF BID EVALUATION

The award criterion for the conclusion of the supply contract for products is '**the best value for money**'. The score will be awarded taking into account the evaluation factors and subfactors set out in **Annex 2** to this specification, respectively the **financial component - the bid price** and the **technical component**, consisting of 2 subfactors: **the performance of the technical parameters and the delivery time**.

The maximum score, for each factor/ subfactor, will be given to the most advantageous offer in relation to the minimum value requested. For the rest of the admissible tenders, the score shall be calculated according to the algorithm set out in Annex 2.

The evaluation committee will award each bid an individual score, resulting from the summation of the partial scores obtained by applying the calculation algorithm for each evaluation factor/subfactor. **The bid with the highest final score will be considered the winning bid**.

The maximum score that an offer can accumulate is 100 points.

If two or more tenders are ranked first, with equal scores, the tiebreaker will be made taking into account the score obtained at the evaluation factors, in descending order of their weightings. If equality is maintained, the Contracting Authority shall be entitled to request new financial proposals and the successful tender shall be designated the one with the lowest financial proposal.

8. ANNEXES

- Annex 1a - Technical proposal form - Technical compliance for Full solide state FM Transmitter.
- Annex 1a - Technical proposal form - Technical compliance for FM band pass filter.
- Annex 2 - Evaluation factors.
- Annex 3a - Forms for Full solide state FM Transmitter testing.
- Annex 3b - Forms for FM band pass filter transmitter testing.

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ANNEX 1a

Technical proposal form
Technical compliance for FM transmitter with active back-up system

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
I	**Connfiguration**				
a	Full Solid State, air cooled FM transmitters		Yes		
b	Digitally µP controlled transmitter		Yes		
c	Front Panel Diagnostic Display with detailed system information		Yes		
d	Active reserved system in 2+1 configuration (2 main transmitters + active back-up transmitter, rack and wiring, including full automatic change-over system in case of main transmitter fault: switching controller, RF switching system, audio lines and RDS switching system, dummy load)		Yes		
e	Active reserved system in 1+1 configuration (1 main transmitter + active back-up transmitter, rack and wiring, including full automatic change-over system in case of main transmitter fault: switching controller, RF switching system, audio lines and RDS distribution 1:2, dummy load)		Yes		
II	**Frequency**				
1	Frequency range	87.5 ÷108 MHz software digitally programmable	Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
2	Exciter	Digital exciter	Yes		
2.1	Digital controlled oscillator	included	Yes		
2.2	Stereo Encoder	included	Yes		
2.3	Digital Composite Limiter	included	Yes		
2.4	Digital Modulator	included	Yes		
3	Frequency stability	+/-150Hz	Yes		
4	Nominal frequency deviation	± 75 kHz (CCIR 450 - 1)	Yes		
5	Modulation capability	± 150 kHz;	Yes		
6	Class of emission	F8EH	Yes		
7	Stereo emissions	according to CCIR recommendation 450, section 2 (pilot tone procedure)	Yes		
III	**RF Output**				
1	Output RF power	according with quotation request	Yes		
2	Output impedance	50 Ω unbalanced;	Yes		
3	VSWR	a. Automatic power reduction beyond 1.5:1	Yes		
		b. Transmitter should be protected for short and open circuit conditions	Yes		
4	Spurious emissions, including harmonics a. 9kHz-1GHz b. 108 MHz-137MHz	according ETSI EN 302 018 max -16dBm (25microW) for tx 1kW better than -75dBc for tx 150W-500W max -16dBm (25microW)	Yes		
5	Out-of-band emissions a. +/- (200 to 300kHz) b. +/- (300kHz to 500kHz)	 better than -80dBc better than -85dBc	Yes		
6	Output Connector	7/16 DIN	Yes		
IV	**Modulation Inputs**				
1	Inputs (minimum requirements)	1xAnalog LEFT, RIGHT;	Yes		
		- 2xDigital XLR inputs, can be used as: -0/1/2 AES3/EBU (sample rate up to 96kHz; data rate up to 196 kb/s, 16/24/32 bits) and/or -0/1/2 AES192 digital MPX;	Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
		1xMPX (analog);	Yes		
		1xRDS (for external encoder)	Yes		
		automatic switching between input sources with silent detection according to user-configurable thresholds	Yes		
2	IP Input	The provider must offer, within the transmitter system, the possibility to use IP input technology utilizing redundant WAN networks, with instant replacement of packets that may be lost on WAN1 by packets delivered on WAN2. This must take place seamless without switching between streams. Additionally, the technology must support similar functionality on a single WAN as well by utilizing delivery of delayed streams, where packets from second stream replace lost packets from the first stream. Additionally, and at the same time, the IP source must be selectable between primary and secondary source.	Yes		
a	Encoding and decoding for IP signals:	- MPEG2/4: AAC-LC - Linear PCM - Opus - MPEG-TS	Yes		
b	Must be able to upgrade with following algorimths:	- MPEG 1/2 Layer II - MPEG4: AAC-LD/ELD , AAC-HE v1/v2 - E-APT-x	Yes		
V	**Transmission characteristics**				
	Stereo operation				
1	Modulation frequency range	30 Hz to 15 kHz;	Yes		
2	Input impedance	600ohms, balanced for analog 110 ohms for digital	Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
3	AF input level	0 dBu to + 10 dBu, for analog - 10 dBFS to 0 dBFS for digital;	Yes		
4	Pre emphasis	0 µs, 50 µs and 75µs selectable	Yes		
5	Stereo Amplitude Response referred to fmod=400 Hz, 30 Hz to15 kHz,left channel, right channel	± 0.2 dB (without pre emphasis), ± 0.2 dB (with pre emphasis)	Yes		
6	Crosstalk between left and right channels 100% modulation, 30 Hz to 15 kHz	> 60 dB	Yes		
7	Distortion (THD) 30 Hz - 15 kHz, left channel, right channel		Yes		
	- with 75 kHz frequency deviation	< 0.05%	Yes		
	- with 100 kHz frequency deviation	< 0.05%;	Yes		
8	Intermodulation distortion (L or R) 60Hz/ 7kHz, 4:1, +4dBu	< 0.2%	Yes		
9	FM S/N ratio, referred to fmod=400 Hz at75 kHz frequency deviation, peak value measurement, left channel, right channel		Yes		
	- weighted	≥ 80 dB	Yes		
	Mono operation				
10	Amplitude-frequency characteristic referred to fmod=400 Hz, 40 Hz to15 kHz	± 0.2 dB	Yes		
11	FM S/N ratio, referred to fmod=400 Hz at 75 kHz frequency deviation, peak value measurement		Yes		
	- weighted	≥ 80 dB	Yes		
12	Asynchronous AM noise referred to 100% AM modulation at 400 Hz, 50 µs Pre-emphasis and without FM modulation	> 55 dB	Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
13	Synchronous AM noise referred to 100% AM modulation at 400 Hz, 50 µs Pre-emphasis with FM modulation at 75 kHz	> 50 dB	Yes		
VI	**Supply, cooling, environment**				
1	Supply voltage	230Vac ± 15%, 50 Hz ± 3 Hz	Yes		
2	Power factor	> 0.95	Yes		
3	Overall efficiency	> 65% for Tx < 1kW > 70% for Tx = 1kW	Yes		
4	Cooling	Air-cooling, and shut down of the RF output power in case of exceeding temperature or air pressure limit	Yes		
5	Operating temperature range	0°C to+ 45°C;	Yes		
6	Maximum relative humidity	95% non condensing;	Yes		
7	Altitude	up to 2500 m;	Yes		
VII	**Specific requirements**				
1	The FM transmitter should assure an uninterrupted and unattended operation during 24 hours/ day		Yes		
2	The FM Transmitter should be user friendly and simple to operate.		Yes		
3	The equipment quoted must conform to the latest international standards of safety and EMC. The conformance to such standards must be stated in compliance statement (Oferrer will indicate Standard's Name and Number).		Yes		
4	The transmitter shall be characterized by high reliability, high MTBF (15000 hours). A statement need to be provided by manufacturer.		Yes		
5	The transmitters must be installed in a standard 19" rack including power protection & distribution unit, blind panels, top & rear door and all required internal connections.		Yes		
6	The transmitter should have adequately protection against fire, rust and corrosion. An statement need to be provided by manufacturer.		Yes		
7	Transmitter should display various parameters on LCD display.		Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
8	Adequate protection system shall be provided to safe guard the transmitter from damage under fault conditions. The protection system should be fast acting to safe guard the components.		Yes		
9	Typical requirements regarding the protection matter: - Over- load protection for ransmitter. - Protection against over temperature. - Main power supply protection. - Protection against high VSWR including open and short conditions at output. - Immediate power fold-back under severe/damaging fault conditions. Details of fold-back to be provided.		Yes		
10	The FM transmitter must to be provided with calibrated sample port for power measurements		Yes		
11	The FM transmitter must to be provided with automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)). An statement need to be provided by manufacturer. This need to be confirmed by factory test report supplied with the transmitters.		Yes		
12	A proposal for training on factory and factory acceptance is required (see Quotation list)		Yes		
13	The FM transmitter will be provided only with air cooling system.		Yes		
14	A proposal for commissioning (verifying the installation made by customer) in site and site acceptance tests is required..		Yes		
15	A proposal for recommended spare parts kit (included in the offer price) is required. The total value of the recommended spare parts kit will be minimum 5% of the equipment value, see quotation list. The offerer will provide a complete list with the spare parts and price for each item.		Yes		
16	The FM transmitter must to be provided with full local and remote monitoring and control system with HTML5 web user interface for remote operation.		Yes		
	Minimum requirements:				
a)	**Remote**		Yes		
1	Remote control	full transmitter parameters control	Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
2	Minim Remote indication	• on / off status • RF forward and reflected power • Audio input status • Deviation meter • alarms: no carrier, no audio active fold-back -3dB carrier • fault: RF chain and exciter, power amplifier stage, VSWR, temperature, interlock, main power supply.	Yes		
b)	**Local**				
	Display of following parameters	1. Transmitter operating parameters (frequency, output and reflected power, RF currents, main power supply voltage and currents, audio input status, alarm list and history);	Yes		
		2. Fault diagnostic: RF chain and exciter, power amplifier stage, VSWR, temperature, interlock, main power supply	Yes		
		3. Alarms: no carrier, no audio, active fold-back	Yes		
		4. Exciter operating parameters	Yes		
		5. Deviation meter	Yes		
c)	**Monitoring equipment**	**Remote interface:**	Yes		
		• PC remote and monitor facilities: hardware + software firmware;	Yes		
		• All necessary devices and software to integrate the transmitter into the radiocommunications monitoring system (e.g. SNMP protocol, MIB files, etc)	Yes		
		Audio and modulation monitoring	Yes		
		• FM demodulator	Yes		
		• Modulation monitor and metering	Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
		• Audio monitor	Yes		
		• All required cables to connect monitoring equipment	Yes		
17	In the furniture the supplier will provide as "technical documentation", for all furniture, the following items:	Documentation for the mechanical-electrical fitting	Yes		
		Technical manuals containing:	Yes		
		- Specifications			
		- Installation & initial turn on			
		- Operators guide			
		- Controls and indicators			
		- Overall system theory			
		- Maintenance & alignments			
		- Troubleshooting			
		- Overall system & transmitter diagram			
		- Electronic Boards Diagrams			
		- Parts list, etc			
18	All equipments must be conform to the articles of **Directive 2014/53/UE (Directiva RED) of the European Parliament and of the council of 9 March 1999** and its amendment acts on radio equipment and telecommunications terminal equipment, and to all European Community standards that apply to the respective type of equipment (including standards for toxic substances), otherwise the equipments cannot be imported under the Romanian law. All equipments must be **"CE" and "RoHS" certified**. The offerer has to supply the conformity certificates for all equipments. **The manufacturer has to be certified ISO 9001:2015 and ISO 14001:2015**		Yes		
19	All above requirements are mandatory and must be specified in the technical specifications documentation, released by manufacturer, and will be attached as reference; Must be indicated pages for each required parameter for reference.		Yes		

	Technical characteristics	Details	Obligatory	Method of fulfillment of the requirement	References
20	Must be quoted prices for each item in quotation lists, including spare parts kit. The parts included in the spare parts kit will be quoted individually.		Yes		
21	Guarantee periode: 24 months for transmitters and auxiliary equipment.		Yes		
22	Each transmitter will be delivered with factory test report, including at least the measurements and checks required by FM Transmitter Test document (annexed)		Yes		

ANNEX 1b

Technical proposal form
Technical compliance for FM Band Pass Filter 1 kW

Tehnicals caracteristics	Details	Obligatory	Method of fulfillment of the requirement	Referances
Cavities	Min. 3	Yes		
Frequency range	87,5 MHz – 108 MHz	Yes		
Impedance	50 ohms	Yes		
Power	1kW	Yes		
Frequency	according with frequency specified in quotation list	Yes		
Selectivity	selectable +/-1,2 MHz to +/-1,6 MHz	Yes		
VSWR at Fc	<1,08	Yes		
Insertion loss	<0,5 dB , selectivity +/-1,6 MHz	Yes		
Cooling	natural heat dissipation	Yes		

ANNEX 2

Evaluation factors

No.	Valuation factors/subfactors	Required value	Maximum score allotted	Algorithm for calculating the score of admissible bids
1	**Price Offer [Lei / Euro]**	<5.250.000 (Lei) <1.050.000 (Euro)	50	* Maximum score (50) for the admissible offer with the lowest price. * Score for the remaining admissible tenders: **P Price $_x$= (Price $_{Min}$ /Price $_x$) * maximum score allocated**, where: **P price $_x$** - the score obtained by the admissible tender under evaluation. **Price $_{Min}$** - the lowest of the prices of admissible offers. **Price $_x$** - the price of the admissible offer under evaluation
2	**Delivery time**	Maximum 12 months	10	* Maximum score (10) for the admissible offer with the shortest delivery time. * Score for the remaining admissible tenders: **P Time $_x$= (Time $_{Min}$ /Time $_x$) * maximum score allocated**, where: **P Time $_x$**- score obtained by the admissible tender under evaluation. **Time $_{Min}$** - the shortest of the delivery times of the admissible offers. **Time $_x$** - delivery time of the admissible offer under evaluation
3	**Technical performances**	according with table bellow	40	
	TOTAL		**100**	
3	**Table for Technical Performances (stereo operation)**			
3.1	**Stereo amplitude response (AES/Analog inputs)**	± 0.2 dB (referred to selected pre-emphasis curve)	10	min.point (1) for minimum required value (c) max. points (10) for most performant value (b) span = 9 x is vendor value AFC=Amplitude-Frequency Characteristic Formula: **10-((AFCx-AFCb)/(AFCc-AFCb))*span**

3.2	**THD (Total Harmonics Distortion on AES/Analog inputs) 30 Hz - 15kHz, with 75 kHz frequency deviation**	≤ 0,05 %	10	min.point (1) for minimum required value (c) max. points (10) for best value (b); span = 9 x is vendor value THD=Total Harmonics Distorsion Formula: **10-((THDx-THDb)/(THDc-THDb))*span**
3.3	**S/N ratio, referred to fmod=400 kHz, at 75 kHz frequency deviation, weighted**	≥ 80 dB	10	min.point (1) for minimum required value (c) max. points (10) for best value (b); span = 9 x is vendor value SNR=Signal/Noise Ratio Formula: **10-((SNRx-SNRb)/(SNRc-SNRb))*span**
3.4	**Overall efficiency**	> 65% for Tx < 1kW > 70% for Tx = 1kW	10	min.point (1) for minimum required value (c) max. points (10) for best value (b); span = 9 x is vendor value OE=Overall Efficiency **Formula:** **10-((OEx-OEb)/(OEc-OEb))*span**
	Total for Technical performances		40	

ANNEX 3a

FM TRANSMITTER TEST AND FM SYSTEM ACCEPTANCE

to be performed on Dummy Load each transmitter of 2+1/ 1+1 systems will be individually tested

TX s.n.....
Date.....

- Factory Testing
- Site testing

I. Factory testing

to be performed on Dummy Load

1.PERFORMANCE

A) OPERATING FREQUENCY: Pass/ Fail

Carrier stability: ____+/-150 Hz

Pilot tone stability: _____kHz (19 kHz ± 1 Hz)

B) FREQUENCY RESPONSE Pass/ Fail

LIMIT: WITHOUT PRE –EMPHASIS: WITHIN ± 0.2 dB
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION

Freq.	Tx @ 75 kHz		
	WITHOUT PRE-EMPHASIS		WITHOUT PRE-EMPHASIS
	LEFT CHANNEL	RIGHT CHANNEL	MONO
30 Hz			
60 Hz			
125 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

LIMIT: WITH PRE –EMPHASIS: WITHIN ± 0.2 dB
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION

Freq.	Tx @ 75 kHz		
	WITH PRE- EMPHASIS		WITH PRE-EMPHASIS
	LEFT CHANNEL	RIGHT CHANNEL	MONO
30 Hz			
60 Hz			
125 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

C) STEREO CROSS TALK Pass/ Fail

LIMIT: 30 Hz TO 15 kHz: BETTER THAN 60 dB

FREQUENCY	Tx @ 75 kHz	
	LEFT TO RIGHT	RIGHT TO LEFT
30 Hz		
60 Hz		
125 Hz		
400 Hz		
1 kHz		
2 kHz		
6 kHz		
10 kHz		
12 kHz		
15 kHz		

D) DISTORSION (THD) Pass/ Fail

LIMIT: <0.05% @ 75 kHz DEVIATION

	Tx @ 75 kHz		
FREQUENCY	STEREO		MONO
	LEFT	RIGHT	
30 Hz			
60 Hz			
125 Hz			
400 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

LIMIT: 0.05% @ 100 kHz DEVIATION

	Tx @ 100 kHz		
FREQUENCY	STEREO		MONO
	LEFT	RIGHT	
30 Hz			
60 Hz			
125 Hz			
400 Hz			
1 kHz			
2 kHz			
6 kHz			
10 kHz			
12 kHz			
15 kHz			

E) INTERMODULATION DISTORSION Pass/ Fail

LIMIT: better than 0.2% USING 60Hz/7 kHz TONES, 4:1, +4dBu

STEREO		MONO
LEFT	RIGHT	
%	%	%

F) SIGNAL TO NOISE RATIO Pass/ Fail

LIMIT : BETTER THAN 80 dB (weighted)
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION RMS DETECTOR

	STEREO		MONO
	LEFT	RIGHT	
WEIGHTED			

G) AM NOISE Pass/ Fail

LIMIT: ASYNCHRONOUS: BETTER THAN 55 dB/ Pilot OFF
SYNCHRONOUS: BETTER THAN 50 dB/ Pilot ON
0 dB REF LEVEL = 400 Hz @ 75 kHz DEVIATION

ASYNCHRONOUS	**dB**
SYNCHRONOUS	**dB**

H)Spurious emissions (including harmonics): Pass/ Fail

a. 9kHz-1GHz

LIMIT: max -16dBm (25microW) for tx 1kW better than -75dBc for tx 150W-500W

b. 108 MHz-137MHz

LIMIT: max -16dBm (25microW)

HARMONIC	LEVEL
2nd	
3rd	
4th	
5th	
6th	
7th	
8th	
9th	
10th	

SPURIOUS (frequency)	LEVEL

I) Overall Efficiency Pass/ Fail

Limit: > 65% for Tx < 1kW
> 70% for Tx = 1kW

Overal Efficiency.....

2.METERING

A) FWD AND REFLECTED POWER METERING

FWD PWR		**kW**
REFL PWR	**VSWR**	**W**

TOTAL OPERATING **P.A. CURRENT** **.....AMPS**
P.A. VOLTAGE **.....VOLTS**

B) DIAGNOSTIC METERING

-to be detailed by supplier according with transmitter architecture for:

1) CURRENTS
2) VOLTAGES
3) TEMPERATURES

3. OPERATING, ELECTRICAL AND MECHANICAL CHECKS
Pass/ Fail

1. Check for full compliance with technical specification requested.
2. Check the automatic switching operation:
   -tx spare automatically activated and replace any of main tx in case of failure
   -program and RDS line switching (for 2+1 system)
3. Check automatic switch-on at short interrupting of the main power supply (3 interrupts up to 1 second (in 5 seconds interval)).
4. Check of the protections.
5. Check of the monitoring equipment.
6. Check for operating RDS System
7. General mechanical checks.
8. Technical documentation provided (Specifications, Installation & initial turn on, Operators guide, Controls and indicators, Overall system theory, Maintenance & alignments, Troubleshooting, Boards Diagrams, Parts list, others)
9. Factory Test Report

Customer signature **Supplier signature**

ACCEPTANCE CERTIFICATE

The above listed tests have been successfully completed on the following transmitter and the results are compliant with the specifications.

Transmitter Serial Number _____

Frequency _____

Date of Manufacture _____

CUSTOMER REPRESENTATIVE

Name _____

Title _____

Date _____

SUPPLIER REPRESENTATIVE

Name _____

Title _____

Date _____

Comments:

II. SITE TESTS

All tests listed under factory tests item would be repeated on dummy load.

All tests will be repeated also into the antenna.

**Note: The transmitter will be coupled to the antenna via an existing patch panel. Switching between the antenna and dummy load will be done from the patch panel.*

The patch panel input impedance is 50 Ω

NOTE: IT IS MANDATORY FOR THE OFFER TO CONTAIN A DETAILED "ACCEPTANCE TESTS PROTOCOL" INCLUDING THE INDIVIDUAL PROCEDURE AND TEST EQUIPMENTS USED TO MEASURE AND TEST EACH PARAMETER AND FUNCTIONALITY OF THE TRANSMITTERS.

1. TESTING OF ACCESSORIES

The associated equipment shall be tested and inspected as per mutually acceptable Acceptance Test Protocols at the manufacturer's works as well as at the site. The tenderer shall enclose the ATP for each equipment type along with the tender.

ON SITE SYSTEM CHECKS: PASS/FAIL

Transmitter Internal and External Interlock _____

Grounding Switch _____

Automatic AC Restart Test _____

VSWR Manual Foldback Test_____

VISUAL INSPECTION

Transmitter Rack_____

Transmitter Components _____

RF Transmission Lines _____

Patch Panel _____

Program Input Equipment _____

5. TEST EQUIPMENT	MANUFACTURER/MODEL	S/N
1.		
2.		
3.		
4.		

ANNEX 3b

BAND PASS FILTER TEST

Site Test 1kW

THE TESTS INCLUDE:

Tuned Frequency.....
Limits: according with transmitter operating frequency

Selectivity.....
Limits: for +/-0,8 MHz to +/-1,6 MHz: 20 dB

VSWR at Fc:.....
Limits: <1,08

Insertion loss:.....
Limits: <0,5 dB at Fc +/-1,6MHz

Check of the mechanical execution;

Formular XX

Tenderer

.....

(Company name)

Summary
Of prices for products

A. FULL SOLID STATE FM-VHF TRANSMITTER 2+1 @ 1 kW

No	FURNITURE	REQUIREMENTS	Quantity	PRICE site ALEXANDRIA	PRICE site BRAȘOV-TÂMPA	PRICE site GIURGIU	PRICE site MAHMUDIA	PRICE site NEGREȘTI	PRICE site VĂRATEC	PRICE site VASLUI
1	Active reserved system in 2+1 configuration	According with Technical Specifications System power: 2 x main transmitters = 1kW 1 x spare transmitter = 1kW	1 system / site							

Formular XX

No	FURNITURE	REQUIREMENTS	Quantity	PRICE site ALEXANDRIA	PRICE site BRAȘOV-TÂMPA	PRICE site GIURGIU	PRICE site MAHMUDIA	PRICE site NEGREȘTI	PRICE site VĂRATEC	PRICE site VASLUI
2	INTERFACE FOR CONTROL and MONITORING, Local and Remote	- Local and PC remote management and monitoring facilities: hardware + software/ firmware; -All necessary devices and software to integrate the transmitter into the Radiocomunicatii monitoring system (e.g. SNMP protocol, MIB files, etc. via TCP/IP port for ethernet HTML5 web interface or software monitoring/management	1 pc / site							
		Audio and modulation monitoring • FM demodulator (1 pc / main tx) • Modulation monitors and metering • Audio monitor								

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site ALEXANDRIA	PRICE site BRAȘOV-TÂMPA	PRICE site GIURGIU	PRICE site MAHMUDIA	PRICE site NEGREȘTI	PRICE site VĂRATEC	PRICE site VASLUI
3	RDS ENCODERS SET suitable for 2+1 configuration: - Fully compliant with IEC standard 62106	- Spare TX shall be able for automatically operation using RDS configuration of each of the two main transmitters - Scrolling PS and radio text messaging - PS 8 characters and up to 128 characters scrolling messaging - TCP/IP port for ethernet web GUI or software management -6 AF (alternate frequencies) at least	1 set / site							

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site ALEXANDRIA	PRICE site BRAȘOV-TÂMPA	PRICE site GIURGIU	PRICE site MAHMUDIA	PRICE site NEGREȘTI	PRICE site VĂRATEC	PRICE site VASLUI
4	AUDIO PROCESSORS SET suitable for 2+1 configuration	- Spare TX will be able for automatically operation using audio settings of each of the two main transmitters - Multiband processing, EQ, AGC, Clipping - processing/ bypass selectable For external device: - balanced analog input : 600 ohm/>10kohm selectable - balanced analog output: 600 ohm, balanced, (-10 dBu to +14 dBu adjustable) - balanced digital input 110 ohm - balanced digital output: 110 ohm (-20 dBFS to 0 dBFS adjustable) - auto/manual switch audio input - MPX output - XLR connectors for audio input/output - all necessary interconnecting cables	1 set / site							

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site ALEXANDRIA	PRICE site BRAȘOV-TÂMPA	PRICE site GIURGIU	PRICE site MAHMUDIA	PRICE site NEGREȘTI	PRICE site VĂRATEC	PRICE site VASLUI
5	TECHNICAL MANUAL AND COMPLETE DOCUMENTATION	In English	1 pc / site							
6	COMMISSIONING AND SITE ACCEPTANCE TESTS	No of supplier specialist & working days Supplier will support all cost for travelling, accommodation, daily expenses. Buyer will support transport from hotel to site and back	1 pc / site							

TOTAL PRICE A :

B. FULL SOLID STATE FM-VHF TRANSMITTER 2+1 @ 0,5 kW

No	FURNITURE	REQUIREMENTS	Quantity	PRICE site BORSEC
1	Active reserved system in 2+1 configuration	According with Technical Specifications System power: 2 x main transmitters = 0,5kW 1 x spare transmitter = 0,5kW	1 system	
2	INTERFACE FOR CONTROL and MONITORING, Local and Remote	- Local and PC remote management and monitoring facilities: hardware + software/ firmware; -All necessary devices and software to integrate the transmitter into the Radiocomunicatii monitoring system (e.g. SNMP protocol, MIB files, etc. via TCP/IP port for ethernet HTML5 web interface or software monitoring/management	1 pc	
		Audio and modulation monitoring • FM demodulator (1 pc / main tx) • Modulation monitor and metering • Audio monitor		

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site BORSEC
3	RDS ENCODERS SET suitable for 2+1 configuration: - Fully compliant with IEC standard 62106	- Spare TX shall be able for automatically operation using RDS configuration of each of the two main transmitters - Scrolling PS and radio text messaging - PS 8 characters and up to 128 characters scrolling messaging - TCP/IP port for ethernet web GUI or software management -6 AF (alternate frequencies) at least	1 set	
4	AUDIO PROCESSORS SET suitable for 2+1 configuration	- Spare TX will be able for automatically operation using audio settings of each of the two main transmitters - Multiband processing, EQ, AGC, Clipping - processing/ bypass selectable For external device: - balanced analog input : 600 ohm/>10kohm selectable - balanced analog output: 600 ohm, balanced, (-10 dBu to +14 dBu adjustable) - balanced digital input 110 ohm - balanced digital output: 110 ohm (-20 dBFS to 0 dBFS adjustable) - auto/manual switch audio input - MPX output - XLR connectors for audio input/output - all necessary interconnecting cables	1 pc	

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site BORSEC
5	TECHNICAL MANUAL AND COMPLETE DOCUMENTATION	In English	1 pc	
6	COMMISSIONING AND SITE ACCEPTANCE TESTS	No of supplier specialist & working days Supplier will support all cost for travelling, accommodation, daily expenses. Buyer will support transport from hotel to site and back	1 pc	

TOTAL PRICE B:

C. FULL SOLID STATE FM-VHF TRANSMITTER 1+1 @ 1 kW

No	FURNITURE	REQUIREMENTS	Quantity	PRICE site DĂBULENI	PRICE site HOTARELE	PRICE site MOLDOVA NOUĂ	PRICE site SIGHET	PRICE site HUSI	PRICE site SLOBOZIA	PRICE site SULINA
1	Active reserved system in 1+1configuration	According with Technical Specifications System power: 1 x main transmitter = 1kW 1 x spare transmitter = 1kW	1 system/site							
2	INTERFACE FOR CONTROL and MONITORING, Local and Remote	- Local and PC remote management and monitoring facilities: hardware + software/ firmware; -All necessary devices and software to integrate the transmitter into the Radiocomunicatii monitoring system (e.g. SNMP protocol, MIB files, etc. via TCP/IP port for ethernet HTML5 web interface or software monitoring/management	1 pc / site							
		Audio and modulation monitoring • FM demodulator (1 pc / main Tx) • Modulation monitor and metering • Audio monitor								

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site DĂBULENI	PRICE site HOTARELE	PRICE site MOLDOVA NOUĂ	PRICE site SIGHET	PRICE site HUSI	PRICE site SLOBOZIA	PRICE site SULINA
3	RDS ENCODERS SET suitable for 1+1 configuration: - Fully compliant with IEC standard 62106	- Spare TX shall be able for automatically operation using RDS configuration of the main transmitter - Scrolling PS and radio text messaging - PS 8 characters and up to 128 characters scrolling messaging - TCP/IP port for ethernet web GUI or software management -6 AF (alternate frequencies) at least	1 set / site							

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site DĂBULENI	PRICE site HOTARELE	PRICE site MOLDOVA NOUĂ	PRICE site SIGHET	PRICE site HUSI	PRICE site SLOBOZIA	PRICE site SULINA
4	AUDIO PROCESSORS SET suitable for 1+1 configuration	- Spare TX will be able for automatically operation using audio settings of each of the two main transmitters - Multiband processing, EQ, AGC, Clipping - processing/ bypass selectable For external device: - balanced analog input : 600 ohm/>10kohm selectable - balanced analog output: 600 ohm, balanced, (-10 dBu to +14 dBu adjustable) - balanced digital input 110 ohm - balanced digital output: 110 ohm (-20 dBFS to 0 dBFS adjustable) - auto/manual switch audio input - MPX output - XLR connectors for audio input/output - all necessary interconnecting cables	1 set / site							

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No	FURNITURE	REQUIREMENTS	Quantity	PRICE site DĂBULENI	PRICE site HOTARELE	PRICE site MOLDOVA NOUĂ	PRICE site SIGHET	PRICE site HUSI	PRICE site SLOBOZIA	PRICE site SULINA
5	TECHNICAL MANUAL AND COMPLETE DOCUMENTATION	In English	1 pc / site							
6	COMMISSIONING AND SITE ACCEPTANCE TESTS	No of supplier specialist & working days Supplier will support all cost for travelling, accommodation, daily expenses. Buyer will support transport from hotel to site and back	1 pc / site							

TOTAL PRICE C:

D. SPARE PART KIT for 2+1 @ 1kW and 1+1@1 kW systems

No	FURNITURE	REQUIREMENTS	Quantity	PRICE 1 set/Sucursala București; 1 set/Sucursala Iași; 1 set/Sucursala Timișoara; 1 set/Sucursala Cluj
1	RECOMMENDED SPARE PARTS *The offeror will provide a complete list with the spare parts and price for each item/each set.	Each set will contain recommended minimum spare parts kit (electronic boards/modules, power supply, power amplifiers, air filters, air fan, calibrated fuse, RF power transistor, display, switching relays, etc.). The 4 sets will be identically The total value of the recommended spare parts kit will be minimum 5% of the system value of 2+1 @ 1kW and 1+1@1 kW systems	4 Sets (1 set for each site)	

TOTAL PRICE D:

E. SPARE PART KIT for 2+1 @ 0,5 kW system

No	FURNITURE	REQUIREMENTS	Quantity	PRICE site Sucursala Cluj
1	RECOMMENDED SPARE PARTS *The offeror will provide a complete list with the spare parts and price for each item/each set.	Each set will contain recommended minimum spare parts kit (electronic boards/modules, power supply, power amplifiers, air filters, air fan, calibrated fuse, RF power transistor, display, switching relays, etc.). The value of the recommended spare parts kit will be minimum 5% of the entire system value of 2+1 @ 0,5 kW system	1 Set	

TOTAL PRICE E:

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F. BAND PASS FILTER (3 CAVITIES) 1 kW

No	Site	FURNITURE	REQUIREMENTS	Quantity	PRICE site
1	**ALEXANDRIA**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 89,7 MHz	1 Pc	
2	**BRAŞOV-TÂMPA**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 105 MHz	1 Pc	
3	**DĂBULENI**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 99,1 MHz	1 Pc	
4	**GIURGIU**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 102,6 MHz	1 Pc	
5	**HOTARELE**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 91,1 MHz	1 Pc	
6	**MAHMUDIA**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 102 MHz	1 Pc	
7	**MOLDOVA NOUĂ**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 105,1 MHz	1 Pc	
8	**NEGREŞTI**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 89,4 MHz	1 Pc	
9	**SIGHET-FM**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 106,2 MHz	1 Pc	
10	**VĂRATEC**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 100,8 MHz	1 Pc	
11	**VASLUI**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 102,4 MHz	1 Pc	
12	**HUSI**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 101,7 MHz	1 Pc	
13	**SLOBOZIA**	BAND PASS FILTER (3 CAVITIES)	3 cavities, 1 kW, tuned to 96,3 MHz	1 Pc	

TOTAL PRICE F:

G. FACTORY TRAINING AND FACTORY ACCEPTANCE TESTS

No	FURNITURE	REQUIREMENTS	Quantity	PRICE (EURO)
1	FACTORY TRAINING and FACTORY ACCEPTANCE TESTS	6 persons/ 5 working days, including: _Air Transport _Hotel Accommodation _Lunch on working day _Living expenses: 100 euro / day / person _Local transport _Insurances	1 Set	

TOTAL PRICE G:

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Frequency List

Site	Frequency	System type
ALEXANDRIA	91,8 MHz	2+1
ALEXANDRIA	89,7 MHz	
BORSEC	101,00 MHz	2+1
BORSEC	98,40 MHz	
BRAŞOV-TÂMPA	102,5 MHz	2+1
BRAŞOV-TÂMPA	105 MHz	
DĂBULENI	99,10 MHz	1+1
GIURGIU	104,6 MHz	2+1
GIURGIU	102,6 MHz	
HOTARELE	91,1 MHz	1+1
MAHMUDIA	100,5 MHz	2+1
MAHMUDIA	102 MHz	
MOLDOVA NOUĂ	105,10 MHz	1+1
NEGREŞTI	89,40 MHz	2+1
NEGREŞTI	93,3 MHz	
SIGHET-FM	106,20 MHz	1+1
VĂRATEC	91,20 MHz	2+1
VĂRATEC	100,80 MHz	
VASLUI	106,10 MHz	2+1
VASLUI	102,40 MHz	
HUSI	101,7 MHz	1+1
SLOBOZIA	96,3 MHz	1+1
SULINA	100,9 MHz	1+1

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Quotation Grand TOTAL

Item	Description	Price
Total price A	FULL SOLID STATE FM-VHF TRANSMITTER 2+1 @ 1 kW	
Total price B	FULL SOLID STATE FM-VHF TRANSMITTER 2+1 @ 0,5 kW	
Total price C	FULL SOLID STATE FM-VHF TRANSMITTER 1+1 @ 1 kW	
Total price D	SPARE PART KIT for 2+1 @ 1kW and 1+1@1 kW systems	
Total price E	SPARE PART KIT for 2+1 @ 0,5 kW system	
Total price F	BAND PASS FILTER (3 CAVITIES) 1 kW	
Total price G	Factory training and Factory acceptance tests	
	TOTAL	