ANNEXURE A

REQUEST FOR PROPOSAL

1. Purpose of the Request for Proposal

The purpose of this Request for Proposal is to invite eligible institutions of higher learning (IHLs) and research institutes (RIs) to submit research proposal(s) to form part of the research panel on the theme(s) stipulated by the Independent Communications Authority of South Africa (ICASA), hereafter called "the Authority" as part of its engineering and technology research programme. The RFP is expected to result in a project (or projects) for a period of five (5) years.

2. Background

In terms of Chapter 5 and 6 of the Electronic Communications Act No. 36 of 2005 (the ECA) the Authority is mandated to control, plan, administer and manage the National Radio Frequency Spectrum. In doing so, the Authority is expected to ensure efficient use of the scarce resource, the radio frequency spectrum. In addition, the Authority is expected to advise the Minister on policy matters in accordance with the objects of the Act (section 3(9) of the ECA). This would include advice as the Minister represents the Republic of South Africa in international fora, including the ITU (section 34(1) of the ECA).

To achieve its mandate, the Authority has initiated a research and advisory program with the following objectives:

1 To keep the Authority and the industry at large informed on new developments and technologies and the impact that might have on radio-frequency spectrum management;
2 To provide a source of technical expertise to inform rule making and to advise on policy matters;
3 To perform a wide variety of research with an objective of enhancing the efficient use of spectrum;

4 To facilitate national involvement in international fora, including the ITU;
5 To encourage research and development within the ICT Sector;
6 To encourage investments, including strategic infrastructure investment and innovation in the ICT sector;
7 To promote he universal provision of the electronic communications networks and electronic services connectivity for all.

3. Objectives of the Request for Proposal

Collaboration work between the Authority and the institutions of higher learning (IHLs) and or research institutions on spectrum related matters will occupy a unique role in developing and strengthening the capacity to generate an advanced level of administrative, regulatory and technical expertise to address the issues on spectrum arising from the rapid advancement of wireless communications in the communication and multimedia industry. Therefore, the objective of this bid is to facilitate the collaboration process and to promote research on spectrum related matters. Research work should be geared towards achieving or facilitating the following:

a. Address specific questions in ITU-R study groups and prioritised Agenda Items in World Radio Conferences (to be provided on request as needed).
b. Understanding and furthering of emerging technologies – assessment of new technologies such as software-defined radio, smart antennas, cognitive radio, Ultra-Wide Band (UWB) and mesh networks, Orthogonal Frequency Division Multiplex (OFDMA) and Multiple-Input and Multiple-Output (MIMO).
c. Understanding the state and use of the spectrum - monitoring the use of the spectrum, including usage of licence-exempt spectrum and availability of "white spaces" including the use thereof.
d. Encourage spectrum efficiency, spectrum liberalisation and defining alternative spectrum licensing regimes – e.g. spectrum usage rights, Electro- Magnetic Compatibility (EMC) levels, dealing with spectrum fragmentation, spectrum sharing, and propagation studies.
e. Economic value of spectrum and innovative administrative techniques – such as pricing and trading, spectrum ecosystem, sector studies and

forecasting, spectrum parks, spectrum-trading units, spectrum map grids, etc.

f. Understanding dynamic and opportunistic spectrum management
g. The development and Implementation of Reference Geo-Location Database
h. The implementation of the Television White Space (TVWS) Regulatory Framework.

The applicants will be expected to carry out research and, where necessary, development.
This will be based on the some of the following, but not limited to, the following areas:

3.1 Spectrum management

a. Systems and tools for spectrum management;
b. Spectrum economics/ demand;
c. Spectrum pricing;
d. Propagation studies and measurements;
e. Sharing studies;
f. Frequency allocations, and or channel arrangements;
g. Spectrum Sharing
h. Regulatory measures;
i. New concepts and approaches to spectrum management.

3.2 Emerging technologies and concepts

a. Digital broadcasting opportunities and business models;
b. IMT2020 systems and service developments;
c. Software-defined radio and cognitive radio;
d. Technology convergence, including UWB and meshed / ad hoc networks;
e. Coexistence and sharing of IMT systems and systems for other services incumbent in the band identified for IMT to ensure the achievement IMT2020;
f. Licence-exempt spectrum and the characteristics thereof;

g. Short-range devices;
h. Other.

3.3 A reference geo-location spectrum database (Reference GLSD System)

A reference geo-location spectrum database for managing TV Whitespace (TVWS) spectrum needs to be developed. The database, henceforth called "the system" must meet the following technical requirements:

a. The system must be accessible online and provide a user-friendly graphical user interface (GUI) for enabling the Authority a secure login to access its features and to log out.
b. The system must provide sufficient storage and be able to maintain up-to-date technical information and data sets of all incumbent services in the radio frequency band 470 MHz to 694 MHz.
c. The system must be able to maintain up-to-date "Type Approval" information and other relevant information to determine the identity of all White Space devices.
d. The system must be able to calculate countrywide baseline coverage predictions of broadcast TV services in the radio frequency band 470 MHz to 694 MHz in accordance with the ITU GE06[1] agreement.
e. The system must be able to protect the Radio Astronomy service in the radio frequency sub-band 606 MHz to 614 MHz in compliance with protection thresholds prescribed in ITU Recommendation 769[2] as amended.
f. The system must be able to protect systems in the Radio Astronomy service in demarcated polygons in the Karoo Astronomy Advantage Areas (KAAAs) 1, 2 and 3 in compliance with the Astronomy Geographic Advantage Act (AGA Act No. 21 of 2007)[3].
g. The system must be able to protect TV Broadcasting and Radio

[1] https://www.itu.int/pub/R-ACT-RRC.14-2006

[2] https://www.itu.int/rec/R-REC-RA.769-2-200305-I/e

[3] http://www.polity.org.za/article/astronomy-geographic-advantage-act-no-21-of-2007-2008-07-17

Astronomy services operating in the radio frequency band 470 MHz to 694 MHz as prescribed in ITU GE06, ITU Recommendation 769, as well as in accordance with the Memorandum of Understanding (MoU[4]) of the Communications Regulators Association of Southern Africa (CRASA).

h. The system must be able to calculate countrywide baseline Television Whitespace (TVWS) availability maps in the radio frequency band 470 MHz to 694 MHz, excluding the Radio Astronomy sub-band 606 MHz to 614 MHz and SKAAA demarcated polygons 1, 2 and 3.

i. The system must be able to utilise the TVWS availability maps as regulatory limits when verifying the accuracy of secondary geo-location spectrum databases (GLSDs).

j. The system must be able to update the algorithms or parameter values as requested by the Authority.

k. The system must provide a secure communication protocol of an Application Programming Interface (API) for enabling seamless remote synchronisation with secondary GLSDs for periodic verification, monitoring their accuracy and exchange of baseline datasets.

l. The system must provide robust communications security to prevent and protect from unauthorised data input and modification, and unauthorised alteration of stored data.

m. The system must provide robust secure communications with secondary GLSDs to prevent unauthorised parties from accessing or modifying information during transmission.

n. The successful entity must make available to the Authority a virtual radio device as one among various tools to be used during the qualification process of secondary GLSDs.

o. The entity must provide a work plan on human capacity building to use the systems features.

p. The entity must provide a work plan for routine and preventative maintenance of the system.

[4] http://www.crasa.org/crasa-publications-details/id/105/memorandum-of-understanding-on-cross-border-coordination-on-radio-communication-services-sadc./

4. Expected outcome of the collaboration program

Beyond the results of research and development projects, the collaborative efforts will encompass the following benefits:

a. Capacity building and knowledge growth for those dealing with spectrum management
b. Funding of research themes which are in line with the needs of the industry
c. Provision of a platform for sharing knowledge and exchange of expertise locally, within the region and internationally
d. Through the promotion and organisation of seminars, symposiums, conferences and workshops, the field of spectrum management could be introduced to a wider audience.
e. Presentations tailored at a level within grasp of the public to get acquainted with the field of spectrum management
f. The collaboration will increase the spectrum management capacity of the Authority and increase the scope to provide better spectrum related services in South Africa and to assist regionally and internationally.
g. The collaboration will increase regulation-making capacity to ensure proper professional rulemaking.
h. Provide the maintenance and upkeep of the Reference GLSD system.

5. Request for proposal evaluation criteria

The following evaluation criteria will apply for an institution of higher learning or research institute to be appointed on the panel:

Item	Criteria Description	Weight
1	*Relevance of organisation:* The bidder must show how the focus of its organisation has relevance to the subject matter and scope of the Authority's needs, including how the diversity of its capabilities could contribute to the development of spectrum management, system development, and system implementation, knowledge within the Authority and capacity building within the Authority. The bidder must give a high-level description of its research and development capabilities and methodologies and show how its approaches will lead to successful envisaged outcomes in terms of the Authority's requirements.	20 points
2	*Qualifications:* The qualifications of the bidder's human resources should include degrees or equivalent qualifications in engineering, telecommunications, economics, and commerce or any other equivalent qualification relevant to research and development, from a recognised institution.	15 points
3	*Knowledge and expertise:* The bidder should detail the knowledge and expertise it has relevant to the Authority's needs. It should detail what level of engineering and ICT knowledge it has, including the level of knowledge and expertise in relation to radio-based technologies and the methods and principles by which radio-frequency spectrum is managed in a regulatory environment.	15 points

4	*Experience:* The bidder should have demonstrable significant experience in research and development in the identified fields. The bidder must have experience in preparing appropriate documentation such as research reports, journal papers and system operating manuals. It should give details of its role in relevant past conferences and workshops – e.g. conducting/leading proceedings, presenting papers, conducting equipment demonstrations. Any certifications from other organisations, where relevant, should be mentioned.	20 points
5	*Project Planning and costing Methodology:* The bidder must provide examples of work plans or a generic work plan showing how the research and development in the identified fields will be executed. The plan must show how budget is determined and show how budget and other parameters are aligned with performance indicators. It should give details as to how the allocated funds could be used.	15 points
6	*Resources:* The bidder should provide evidence that it has the necessary technical and organisational resources (including appropriate tools), financial capability and other resources necessary for executing the work. The bidder must show how it may have to collaborate with other departments within its own organisation or with other institutions. Where the bidder has linkages to and relationships with other institutions of the same or complementary nature – in either South Africa or elsewhere – it should provide details.	15 points
Total		**100 points**

6. Expertise required from the successful **institutions of higher learning (IHLs) and research institutes (RIs).**

The bidder is expected to have high expertise for research in radio-communication other forms of telecommunication, policy matters and spectrum management.

7. Deliverables and timeframes

The successful applicant is expected to have the following deliverables:

Deliverable 1 three months after the research project award:

- Summary of relevant research work already done and specific outputs serving as a springboard for research and development work in this collaboration.
- A detailed research proposal for each research and development action to be undertaken covering the following:
    1. Background information, objectives, motivation, and problem statement all showing the significance of, or contribution made by, the research and development.
    2. A comprehensive literature review showing relevant work and points-of-departure as the case might be and conceptual framework or perspectives.
    3. A statement of research and development question or hypothesis or description of phenomena to be examined and explain how this would elucidate the problem and how it would fit in the conceptual framework.
    4. Research approach or methodology - description of plans for collecting and analysing data, including tools and procedures.
    5. Schedule of work or task structure.

Deliverable 2 (Three months: Technical reports detailing work already done, methods used – e.g. measurements done, raw data, and analysis of the data as the case might be.

Deliverable 3 (from time-to-time): Other secondary reports as research and development spin-offs.

Deliverable 4 (at least on an annual basis): Research journal papers or conference proceedings, system development and performance as agreed from time to time. A final annual report stating the objectives achieved, output, and capacity building.

The bidder and the Authority, whenever practically possible, should be able collaborate in developing proposals, reports and research papers, either as co-authors or as contributors.

8. Response format

The bidders shall submit its response in accordance with the response format specified below;

I. Schedule 1: Executive summary

The executive summary must be brief and cover the following:

Paragraph 1 The institution of higher learning/research institution should affirm individuals (by name and surname) who have been mandated by the executive committee to act on behalf of the consortium, joint, partnership or prime contractor, as the case might be.

Paragraph 2 The institution of higher learning or research institution should give an overview of similar tasked performed before. Contact details for reference should be provided.

Paragraph 3 The institution of higher learning / research institution should give a short summary characterising the proposal.

II. Schedule 2: Functional response – covering the following:

1. Detailed research and development methodology, approach and research infrastructure currently in place (including collaborations and leverages).
2. Research and development material and equipment (e.g. laboratories, hardware and software).
3. Specific research and development work currently being carried out and associated outcomes and plans.
4. Chosen themes or research and development areas in this Request for Proposal (RFP) and motivation thenceforth.
5. Proposed methodology and approach and envisaged outcomes for this RFP.

6. Resources and infrastructure to be used for this RFP.

7. Work plan showing key performance areas, aligned with budget.

8. Work Breakdown Structure

9. Resource Plan and Allocation

10. Methodology

III.Schedule 3: Institution of higher learning or research institution

1. Credentials of the institution of higher learning / research institution
2. Structure of the institution of higher learning or research institution