

NMISA NMS PROJECT PROPOSAL

Action Field	Information		
Project Title	Measurement of UV for COVID-19 disinfection		
Division Name	Physical and Electromagnetic Division		
Financial year	2020/2021	To	2021/2022
Project leader (Responsible person)	Pieter du Toit	Signature: Date: 19/10/2020	
Section Head	Liesl Burger	Signature: Date: 19/10/2020	
Final Approval by Director (not required at time of submission)			
National Measurement Standard and units been maintained			
	Year 1	Year 2	Year 3
Budget Estimate (kR)	kR	kR	kR
	Year 1	Year 2	Year 3
Revenue Estimate (kR)	kR	kR	kR

1. General Information

1.1. Project History

Period	Main Deliverable	Financial Data
Year 1: (20/21)	New project	
Year 2: (21/22)		
(add years if needed, max 5)		

1.2. Project description

Give an overview of the nature of the work to be undertaken. Include a description of the expected outputs from the project and how these will contribute to the metrology theme. Specifically mention if it is a base unit, or to which base unit it links, if it is maintenance of the current capability, an improvement or to establish a new NMS. Summarise the Impact and Revenue generation potential, i.e. size of the market, etc. Be brief and to the point, single sentences are preferred in bullet format

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1.3. Background to the proposal

Describe the background to the project: Refer to the current status and relevance, previous work undertaken, why an improvement is necessary, etc.

The ability of UV light to disinfect has been known for years. UV-C in particular interrupts sequences of DNA and RNA in all living organisms, and renders them unable to reproduce, and thereby preventing the spread of a number of pathogens. The UV group at NMISA has been involved with the calibration of UV-C measuring equipment for several years in support of the UVGI initiative against tuberculosis.

With the current COVID-19 pandemic this technology has found application in the sterilization of air, PPE and surfaces. While a number of companies already supply UVGI equipment, there are also a number of South African companies which have designed and developed UV disinfection devices for a range of applications, as well as mass-produced UV devices designed for personal use being imported.

For the protection of users, these devices must be tested to ensure that they are both safe and effective.

1.4. Link to key NMISA focus areas:

Mark the focus area that your project is linked to:

- ☒ Manufacturing (including dissemination and assistance to SMEs, exports, etc.)
- ☒ Agriculture and Food
- ☐ Energy efficiency
- ☐ Green Economy
- ☐ Audits and PT Schemes
- ☐ Telecommunications
- ☒ Materials Characterisation/Metrology
- ☒ Health and Environment
- ☐ Law Enforcement
- ☒ Radiation Safety
- ☐ Dosimetry
- ☐ Other Nuclear (Environmental monitoring, energy generation, proliferation, etc.)
- ☐ Regional Integration (Traceability for SADC, Shortening the traceability chain for Africa, or in support of the AfCFTA)
- ☐ Other (please elaborate below)

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1.5. Objectives

List the key objectives to be achieved (under the NMISA Goals)

NMISA Goals	Objectives
Shorten the Traceability Chain for Africa by maintaining the Units and NMS at an Internationally recognised level. To ensure that the South African measurement system is internationally comparable.	To extend the irradiance level calibration capability up to 25 mW/cm ²
Ensure an Effective Dissemination of the Units and NMS to National and Regional laboratories. Provide essential support to the South African public, private enterprises and the Region through the dissemination	To provide traceability to UV-C measuring devices To offer UV-C calibration services



of the National Measurement Standards, units and expertise.	To measurement knowledge and expertise via consultation and training courses
To provide Metrology for Regulatory Purposes. To support regulators and government laboratories for compliance and the development of regulations through technical expertise and measurement solutions.	To provide measurement knowledge and expertise as part of technical infrastructure through SABS technical committees and SANAS STC, should this be required.
Metrology Services for Government and State-owned Enterprises. To assist Government and SOEs to save costs by providing efficient shared services.	To provide calibration and measurement services for the Department of Health and affiliated research bodies

1.6. Activities/Tasks

Describe the key activities or tasks of the project (Be very specific for the period, i.e. maintenance of Quality system, comparisons, CC and TC meetings, national and regional dissemination, etc.)

2022/2023:

- Develop a standard measurement procedure for UV disinfection devices for:
 - Flux
 - irradiance
- Extend the current measurement capability of 1 mW/cm² to 25 mW/cm²
- Provide a consultation, calibration and measurement service to industry on an ongoing basis
- Provide a series of UV courses:
 - Basic user safety
 - Measurement advice for device maintenance an safety
 - UV measurement and calibration for engineers
- To write articles in technical journals and the popular press on the safety and effectiveness of UV-C devices with advice for medical personnel, engineers and consumers.

2022/2023:

- xxx
-]

2023/2024:

- xxx

1.7. Potential benefits

2. Relevance

2.1. What is the current offering with associated uncertainty?



2.2. What is the requirement from industry, the region or society?

2.3. Do you have the capability to develop to the level of what is required?

Parameter	Capability
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2.4. How long will it take to develop?

Parameter	Capability	Time to develop
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2.5. What is the alternative, i.e. is it practically possible for RSA (and SADC) to obtain traceability from elsewhere?

Parameter	Alternative
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3. Project Team:

3.1. Composition

Name	Role	Project Responsibilities	Section
Liesl Burger	Scientist (Section Head)	Project member: <ul style="list-style-type: none"> Customer service Research Article authorship 	PR
Macdufe Mkabela	Scientist	Project member: <ul style="list-style-type: none"> Customer service External calibrations Research Procedure development Article authorship 	PR
Pieter du Toit	Scientist	Project member: <ul style="list-style-type: none"> Customer service External calibrations Expert advice Procedure development Article authorship 	PR
Rheinhardt Sieberhagen	Scientist	Project member: <ul style="list-style-type: none"> Customer service External calibrations Expert advice Procedure development Article authorship 	PR



3.2. Project Team's Ability to Execute:

Describe the team capability to deliver (core competencies, contributing competencies, lacking competencies).

Sub-Initiative	People (e.g. skills, HCD)	
	Not Available (Required)	Available

4. Milestones and deliverables

A description of each milestone (decision point for continuation of the project) must be included, together with the due date for the milestone. The deliverables at each milestone should also be described. The investment required per milestone should be based on the actual costing

Investment summary			Financial year	Estimated Investment (R)
Current year of investment			Year 1	R
Investment details (current year):			2020/21	R
Milestone/Task/ Deliverable name	Task start date	Milestone/ Task delivery date	Milestone/Task/ Deliverable description	Estimated Investment (R)
Develop a standard measurement procedure for UV disinfection devices for flux & irradiance:				
Draft procedure - irradiance	April 2020	Sept 2020	Develop a draft procedure for irradiance measurements	
Draft procedure - flux	April 2020	Dec 2020	Develop a draft procedure for flux measurements	
Provide a consultation, calibration and measurement service to industry on an ongoing basis:				
Research into UV Disinfection, Measurement and Calibration	April 2020	March 2021	Ongoing research into the latest developments	
Provide a series of UV courses:				
Basic user safety	April 2020	June 2020	Online course to the public as a public service	



Measurement advice for device maintenance and safety	April 2020	Aug 2020	Online short course	
UV measurement and calibration for engineers	April 2020	Dec 2020	Online intensive course	
Articles in technical journals and the popular press on the safety and effectiveness of UV-C devices with advice for medical personnel, engineers and consumers:				
Article on UV Disinfection	April 2020	June 2020	Article written, reviewed & published	
Article of UV calibration	April 2020	Sept 2020	Article written, reviewed & published	
Review article of available UV disinfection devices	April 2020	March 2021	A number of devices measured for safety and effectiveness Article written, reviewed & published	
Extend the current measurement capability of 1 mW/cm² to 25 mW/cm²:				
xxx	April 2020	March 2022	xxx	R xx xxx
General:				
Maintain Quality System	Continued	Continued	Maintained Quality System	
Total current year**				R x xxx xxx

5. Capability Information

Identify essential capabilities available/ required for the project. Add additional rows if required

Sub-Initiative	Technology (e.g. equipment, software)		Infrastructure (e.g. Facilities, Logistics)	
	Not Available (Required)	Available	Not Available (Required)	Available

6. Risk, Constraint and Opportunity Assessment

Identify main risks and opportunities associated with the project including essential capabilities and/or equipment and facilities required for the project that may constitute a Risk or Constraint if unavailable.



7. Annual Performance Plan (APP) Information

Give an indication of the Project contribution to KPIs. If not available at this stage, it can be added later.

**The definitions of the KPIs are available in the NMISA Annual Performance Plan 2020-2023*

Performance Indicator*	KPI No.	Source						
			2021/2022				2022/2023	2023/24
			Q1	Q2	Q3	Q4	Annual	Annual

The following section is needed to evaluate the Market relevance and level of continued investment in this NMS. Not everything may be applicable to the project and especially maintenance of an existing NMS, but your assistance to build the picture will be greatly appreciated.

Not all the information may be available now, but please put in everything that is known, it will then be developed with time to build a full picture for better decision making.

Where an answer has been supplied in any section above, this can be indicated here without repeating the information.

8. Market relevance