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Reverse Engineering and Addditive Manufacturing Qualification of Medium/Large Obsolete Parts for Energy and Mining applications: Building Resilient Supply Chains

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ORGANISATION PROFILE



CSIR Total Staff Base	2 298	Black South Africans	1 806 (79%)
Female South Africans	1 060 (46%)	Total SET base	1 617 (70%)
Black South Africans in SET base	1 185 (73%)	Female South Africans in SET base	648 (40%)
Employees with disabilities	2.7%	SET base with Master's	485 (30%)
SET base with PhDs	312 (19%)		

The objectives of the Council for Scientific and Industrial Research are: Developing, maintaining and **applying SET capabilities** for the **inclusive growth of the South African economy, improving the performance of industry and supporting creation** of a **capable state.**



Technology development

-**Radar** technologies for surveillance, tracking, remote sensing, protection, warning and interception

-**Additive manufacturing** technologies



Product development

-Eco-friendly **flavours and fragrances, biocides, cosmetic** products

-Rapid development of **ventilators** during the Covid-19 pandemic



Custom solution development

-**Curbing rhino poaching**: surveillance system for Kruger National Park

-**Wastewater treatment** solutions



Evidence-based decision support

-Information Management System for **coastal management**: floods, algal blooms, fisheries

-National Policy Data Observatory enabling response to **Covid-19 and natural disasters**



Technology licensing

-**Heavy vehicle simulator**

-Qfrency **text-to-speech**

-**Multispectral camera** technology



Specialised training

-Learning Factory for **upskilling and re-skilling for the fourth industrial revolution** with merSETA

- **Cybersecurity training** for entities



Highly specialised services

-**Laser repair** of steam turbine parts for Eskom.

-**Refurbishment of underwater sonar** for the SA Navy

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PROPOSAL INTRODUCTION (I)

Vision: main project goal

Establish an industrially validated framework for the rapid reverse engineering, additive manufacturing, and qualification of medium-to-large obsolete metallic components used in energy generation, mining, mineral processing, rail, and heavy industrial sectors.

Motivation: why the project is necessary

The energy and mining sectors are increasingly challenged by aging infrastructure, obsolete equipment, discontinued OEM components, and vulnerable international supply chains. Critical equipment failures often result in prolonged downtime because replacement parts are unavailable, have lead times exceeding 12-24 months, or require expensive custom manufacturing.

Content: which are the developments to be made in the project

On demand manufacturing using 3D printing for localized production of spare parts with reduced lead times.

PROPOSAL INTRODUCTION (II)

Expected outcome: descriptions of the results to be obtained in the project

The project will deliver a validated digital-to-manufacturing framework for the rapid reverse engineering, additive manufacturing, qualification, and deployment of obsolete medium-to-large metallic components used in the energy and mining sectors. The outcomes will address technical, industrial, economic, and strategic challenges associated with equipment obsolescence and supply chain vulnerability.

Impacts: what will be the expected market impact of the project

The proposed project will create significant market impact by enabling the transition from conventional spare-part procurement models to digitally enabled, on-demand additive manufacturing of obsolete components for the energy and mining sectors

Schedule: start and end dates for the project. Duration.

Project start: June 2027, Project end: May 2030

PARTNERS

Current Consortium: list of partners already involved in the project

South African partners:
Council for Scientific and Industrial Research
University of Venda

Partner search: type of partner searched and countries of origin (if necessary).

CONTACT INFO

Contact info: of the person coordinating the project proposal

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