Congru Solutions (Pty) Ltd

Experience and Data Driven Decisions on Assets

This unique combination yields dependable decisions which is required for real time decision making

www.congru.co.za

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About Us

Congru Solutions was established to provide technical assistance on high and medium voltage plant. Our strength is our highly experienced team and historical data which drives our decision making process for your critical assets. Innovative and customised solutions for the African utilities, mines and industry. World class diagnostic, predictive and prescriptive analytics of test data irrespective of your choice of test equipment. Equipped with the latest technology for onsite testing and world class analytics ensures high level of confidence in our decision making process.

We are a Level 1 Broad-Based Black Economic Empowerment (B-BBEE) company.

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The DNA of our Technical Leaders

Experienced and Independent

Luwendran Moodley (Pr Eng)

Technical Director

Qualification:
BSc Eng (Electrical)

Professional Registration:
Pr Eng (ECSA)

Expertise:
Diagnostics, Fleet Assessment, Training, Forensic Investigations, Transformer condition assessment, Technical Specification, Transformer Strategy Development

Key Positions
Senior Manager: Technology Services
Senior Manager: HV Substations
Managing Director and General Manager: Doble Africa
Director of Sales and General Manager: Sub-Saharan Africa : Altanova Group
Technical Director: Congru Solutions

Luwendran has 25 years' experience in the field of electrical engineering. He spent 10 years with at a local utility where he accumulated extensive experience in both transmission and distribution plant and equipment.

He spent his formative years in distribution in the fields of technical specification and standards for plant and equipment, failure investigations, introduction of new technology – where he was first an Engineer and later became the Senior Manager: Technology Services. The latter years at the utility as the Senior Manager: Transmission Substations where he was responsible for the company's substation assets.

Luwendran joined Doble Engineering Company as the General Manager: Doble Engineering Africa in 2007. He was the lead in establishing the office in South Africa that services the whole of the African continent. He grew the business heavily based on his technical acumen and established himself as the technical lead within the company. He soon became technical renowned for his expertise on diagnostic testing and interpretation, transformer fleet management, developing Health Indices, failure investigations, training, and the go to person for SFRA interpretation in Africa. Luwendran spent 15 years at helm of Doble Engineering Africa.

After the acquisition by Doble Engineering Company of the Altanova Group, Luwendran was appointed as the Director of Sales and General Manager for sub-Saharan Africa for the Altanova Group in 2022. Following a very brief stint with the Altanov Group he joined Congru Solutions (a proudly South African company) as Technical Director.

Luwendran holds a bachelor's degree in Electrical Engineering (BSc Eng). He is a registered professional engineer (Pr Eng) with Engineering Council of South Africa (ECSA) and a member of South African Institute of Electrical Engineers (SAIEE). Luwendran has published and presented several papers and articles both locally and international.

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The DNA of our Technical Leaders

Experienced and Independent

Kamendren Govender (Pr Eng)

Operations Director

Qualification:

BSc Eng (Electrical)

MBA

Professional Registration:

Pr Eng (ECSA)

Expertise:

Partial Discharge, Interpretation and analysis, life management of assets, root cause analysis, condition assessment

Key Positions

Principal Engineer: Doble Africa
Senior Principal Engineer: Doble Africa
Service Manager: Doble Africa
Operations Director: Congru Solutions

Kamendren's engineering career currently spans over 20 years where he has specialized in the interpretation and analysis of test data, health assessment of high voltage substation plant and transformer fleet management. His other forte includes compilation of specifications, strategy and operation procedures and life management practices.

His engineering profession started as a utility engineer in eThekwini Electricity where he focused in the Technical Support and High Voltage Operations departments. During this time, he was involved in technology evaluations, equipment failure investigations and testing and commissioning. Other major roles and responsibilities included the maintenance of HV plant and equipment for transmission systems and dealing with technical and commercial issues in the procurement of distribution and transmission equipment.

In 2008 he joined Doble Engineering Company as a Principal Engineer in the Consulting Services division. Here he was primarily involved in testing and diagnostics of HV Plant, interpretation of data and research into new technologies and practices. During this time, he grew to become a leading expert in Partial Discharge testing and analysis of Substation plant. In 2015 he became the person responsible for managing all services projects and leading the strategic direction of the company's service division. He was involved in the creation and management of condition assessment engineering teams, execution of projects and dealing with technical and commercial contracts.

In 2022 he joined Congru Solutions as the Operations Director

Kamendren holds a bachelor's degree in Electrical Engineering (BSc Eng) and a MBA degree. He is a registered professional engineer (Pr Eng) with Engineering Council of South Africa (ECSA) and a member of South African Institute of Electrical Engineers (SAIEE). Kamendren has published and presented several papers and articles both locally and international.

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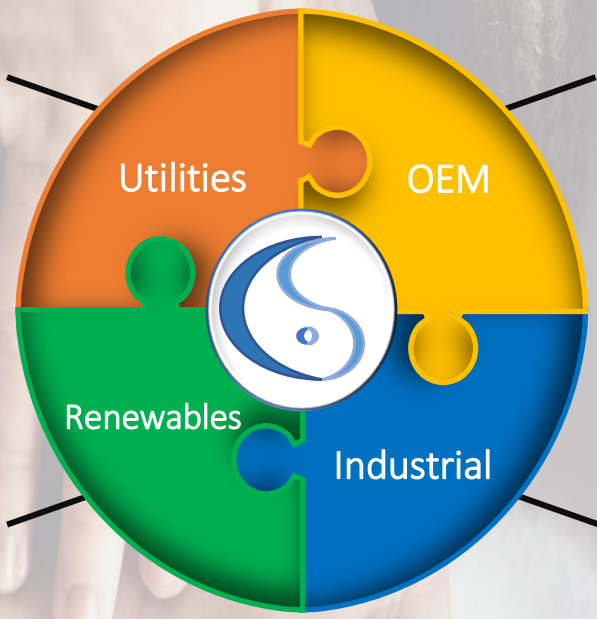
Loyal Customers Base

Trusted, Tried & Tested

Congru's Engineers has developed a trust relationship and a proven track record with a number of customers across the energy sector within Africa. Congru's technical support, 24/7 access to our Engineers, fast and accurate interpretation of results and a proudly South African company has built a sustainable loyal customer base.



City Power, eThekwini,
Cape Town, ESKOM
(Generation, Transmission & Distribution)
NamPower, BPC
KenGen, Kenya Power,
ZESCO, CEC
TEMA and HCB

Actom
LHM
SGB Smit Power Matla
Siemens
ABB
Rotek

Songas
Dorper Wind Farm
JUWI Renewable Energies

EXXARO, Mondi,
South 32, RBM,
Anglo Coal, Sappi, Engen,
Arcelor Mittal, KC,
Tronox, United Steel,
Mumi Mine, Debwana
Mine, Kibali Gold

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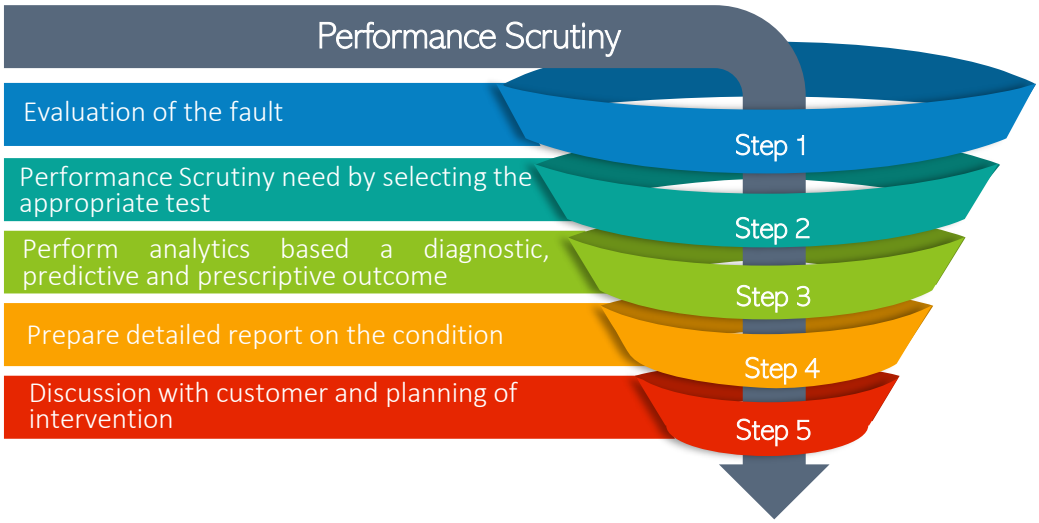
Our Services: Asset Services

Diagnostic, Predictive and Prescriptive Analytics

Performance Scrutiny

Performance Scrutiny is a series of online and offline tests to establish the performance of the asset under normal or fault conditions. Congru Solutions offers customers onsite testing and diagnostic, predictive and prescriptive analytics of the test results. Our technical team have established a database of thousands of assets within the African continent. This has proven to be effective tool in understanding asset failure modes within our local conditions and providing the optimum solution to customers. Congru Solutions relies on our tried and test five (5) step approach for incipient faults.



Performance Scrutiny has proven for decades to be a valuable tool but requires expert diagnostics through sound engineering theory and extensive experience. The conclusions drawn from the test results must provide a condition of the asset and not merely indicating Pass or Fail. Below is a series of online and offline test we offer:

Plant	*Transformer*	*Metal Clad Switchgear*	*Surge Arrestors*	*Instrument Transformers*
Online	• Visual inspection • DGA, Oil quality and Furans • Infrared Scanning • Partial Discharge	• Visual inspection • Partial Discharge	• Visual Inspection • Partial Discharge • Infrared Scanning • Leakage Current	• Visual Inspection • Partial Discharge • Infrared Scanning
Offline	• Power Factor (Tan Delta) • Voltage Ratio • Exciting Current • Leakage Reactance • Winding Resistance • Insulation Resistance • Frequency Response Analysis	• Vacuum Integrity • Timing • Coil current • Power factor	• AC watts loss	• Power factor

For more information on our training courses please click the link below: https://www.congru.co.za/services

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Our Services: Transformer Service

Experience and Data Driven Operational and Financial Decisions

Transformer Condition Assessment Strategy

(with Health Indices/Risk Indices for Transformer Fleet Management)

Congru Solutions offers customers a bespoke condition assessment strategy that will give credibility to operational and financial decisions. Congru Solutions condition assessment strategies is broadly based on three approaches namely Fleet Appraisal, Fleet Survey, and Fleet Scrutiny.

Fleet Appraisal is the technical assessment of readily available data, no outage is required and cost effective. Minimal data such as DGA is sufficient to assign a risk index to the transformer's dielectric and thermal condition

Fleet Survey is all activities within Fleet Appraisal but accompanied by online surveys. No outage is required but onsite survey such as PD scanning is performed. The additional online tests increase the confidence level of the risk index/score. This process is essential to prioritize transformers that will undergo a more detailed assessment during the Fleet Scrutiny stage.

Fleet Scrutiny is typically performed on transformers that have been assigned a high risk index from Fleet Appraisal or Fleet Survey. Further investigation would require an outage to perform onsite offline electrical tests. These electrical tests are used to determine the severity and location of the fault. The transformer is then assigned a risk index based on its dielectric, thermal and mechanical condition.

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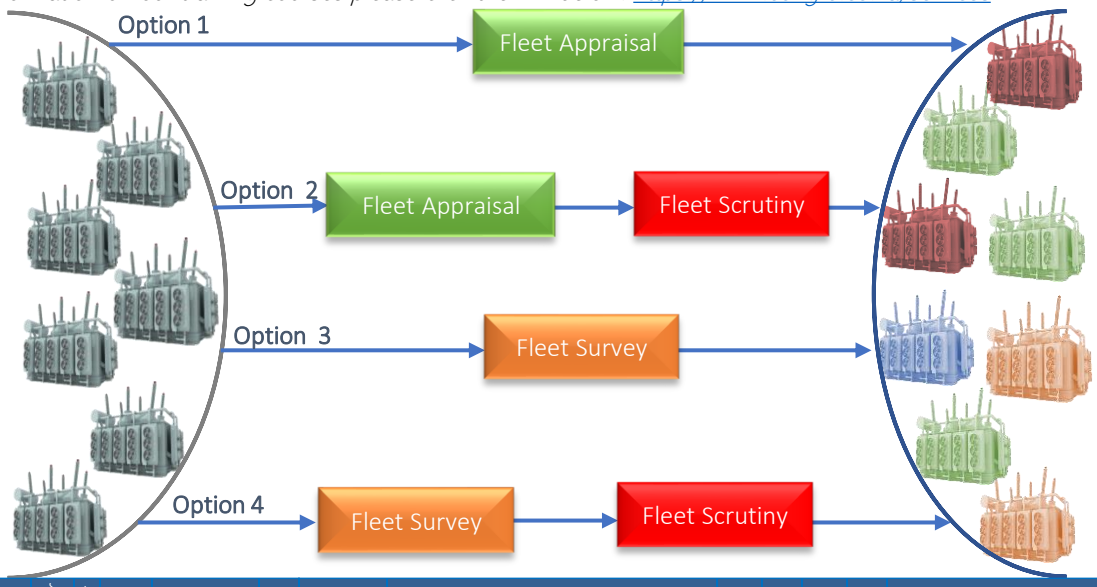

Substation	Circuit	Serial Number	Manufacturer	Year	Voltage Ratio	Rating (MVA)	Condition	Action	Overall	Dielectric	Thermal	Mechanical	Comments
Morningside	T1	287	A	1987	132/11	30	Healthy	None	3	1	1	1	
Windemere	T2	726	A	1987	400/275/22	500	Healthy	None	3	1	1	1	
Pinetown	T1	870	B	1981	132/11	40	Impaired	Drying techniques and repair of oil leaks	42	40	1	1	High moisture (35ppm) due to oil leaks
Bluff	T2	115	E	1972	275/132/11	315	Healthy	None	3	1	1	1	
City	T1A	210	A	1967	33/11	15	Unfit	Oil regeneration and electrical testing	102	100	1	1	High acidity (0.12). Requires PD scan
Overport	T1B	266	A	1974	132/11	40	Suspect	Perform SFRA after short circuit event	7	1	1	5	Know to be prone to hoop buckling
Chatsworth	T2A	629	A	1974	132/11	30	Healthy	None	3	1	1	1	
Umlazi	T2B	210	A	1967	132/11	30	Neglected	Oil analysis required (DGA and quality)	21	10	10	1	DGA not current last taken 18 months ago
Cleremount	T1	699	P	1980	33/11	25	Unfit	Electrical testing	200	100	100	1	Thermal fault involving paper insulation
Klaarwater	T2	809	D	1981	400/275/22	500	Healthy	Repeat DGA measurements	3	1	1	1	Abnormal Methane values
Hillcrest	T1	748	B	1977	275/132/11	315	Impaired	Perform DGA every 3months	52	1	50	1	Developing bare metal thermal fault

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Our Training and Knowledge Sharing

Experience and Practicality Dictates

Training

Our team understands that utility, industrial and mining Engineers have demanding roles and responsibilities that may prevents them from becoming an expert in all pieces of plant. Congru has the luxury of having a team that are considered experts in their given field. As such we have developed courses as a knowledge sharing campaign rather than textbook type training. The courses are not filled with extracts from textbook but rather useful practical application. Our courses are created and delivered by practicing Engineers who understands the needs of you and your organisation.

Current Courses

- *Determining the Health of a Transformer*
- *Assessing the Mechanical Integrity of Transformers*
- *Developing a Condition Monitoring Strategy for Transformers*
- *Partial Discharge Testing and Analysis of Substation Plant*

These courses are also offered at the University of Pretoria (UP)

For more information on our training courses please click the link below: https://www.congru.co.za/training

Knowledge Sharing

Webinars

Our team has developed free one hour webinars (at no cost to your organisation) to expose attendees to best practices, to provide an excellent source of information and introduces your organisation to what is possible.

- *Oil Analysis for Transformers as Part of a Condition Monitoring Strategy*
- *Transformer Electrical Testing as part of a Condition Monitoring Strategy*
- *Partial Discharge Detection on Substation Plant*
- *Online Monitoring for Critical Transformers*
- *Developing a Condition Monitoring Program for Transformers*

Technical Articles and Papers

These are a series of technical information written by our Engineers over their +25 years careers

Case Studies

These are a series of interesting case solved by our Engineers over their careers. These case studies are rich in value for enhancing an Engineer's diagnostic, predictive and prescriptive analysis of test data.

To book a Webinar and/or to read a technical paper and/or to take in a case study please click the link:
https://www.congru.co.za/knowledge-base

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Contact Us

If you have the need to enter into a conversation, contact:

Kamendren Govender +27 (0) 79 501 6887 kgovender@congru.co.za

Luwendran Moodley +27 (0) 79 515 5164 lmoodley@congru.co.za

Our Offices: Durban (HQ) and Pretoria – South Africa

Visit our website: *www.congru.co.za*