



ELECTRICAL POWER ENGINEERING

Department of Electrical Power Engineering

Postgraduate Research Template

#	Student Name / Surname	Bhekinkosi Pheneas Madonsela	Start date	April 2017	Supervisor	Prof IE Davidson
	Title of Project	Integrating power transformer protection scheme to telecontrol remote terminal unit (RTU)	Completion	May 2019	Co-Supervisor(s)	Dr C Mulangu
Program of Study (M Eng. / D Eng.)			M Eng. Electrical Power Engineering			
	Student #	21208384	Email Address	Madonsbe@eskom.co.za or 21208384@dut4life.ac.za		
<p>Synopsis of Research Project: Automated substations and distribution networks are key element of smart grid, however not all substations and distribution networks are automated to date due to the numerous reasons such as cost related to automation and scarcity of skillful workforce. With the drive to integrate renewable energy to the national smart grid, the advanced and innovative integrating methodologies need to be investigated. Automating the power system is the effort to improve power supply security, availability and reliability. Reliability is very important in substation automation systems and is achieved through real-time monitoring of the substation data. The interconnection of substation through substation automation devices is crucial because it provide the backup link to the network in case one substation fails. The utilities has developed a remarkable interest in substation automation due to the benefit its offers such as; reduction in maintenance and, operating cost and improved revenues due to stable power system networks. Substation automation is made up of four main functions that need to be fused together; protection, control, monitoring and, local and remote communications. There are numerous communication protocols available in the market for substation automation applications. However not all of them are utilized in the current application of smart grid. DNP3 and IEC61850 are the leading communication protocols currently. DNP3 has proved its technical advantages over the past few years in substation automation applications. On other hand IEC61850 was only published in 2003 and became more popular in substation around 2006; the standard is</p>						

only fifteen years old. IEC61850 define the protocols such as; GOOSE, SMV, GSSE, GSE and MMS using its communication profiles. This research will investigate the possibilities of integrating DNP3 data point into IEC61850 data model.