

FFESTINI OG METERING
COMPENSATIONS FOR GENERATOR 1 & 2 METERS
WITH CHANGE OF POWER TRANSFORMER (SGT1)

(BASED ON AWB 2008 NOTES FOR GEN3 & 4)

Power transformer Siemens 190MVA unit with serial number 110791.

The test certificate for the unit gave the following figures for the no-load and on-load losses.

No-load loss at 100 % voltage.	66.41 kW (from page 12 of Siemens report)
On-load loss at rated current	739.7 KW (hot figure at 75 degC) (from page 7)
%Impedance = 18.39 from page 7)	

The transformer rating is 190 MVA = 6856A

As for previous meter power transformer loss compensations at this site half of the power transformer losses will be applied to each meter.
 (Generators 1 & 2)

The new gen meters are each rated at 4000A, 16kV = 110.85MVA
 Total = 8000A

The on-load loss converted to the meters combined rating is:

$$739.7 \times (8000 / 6856)^2 = 1007 \text{ kW} \quad (8000 / 6856)^2 = 1.3616$$

The losses to be applied to each meter are:

Active Meters

No-load (at 100 % V)	33.2 kW	(or 0.03 % of meter MVA)
On load (at 100 % I)	504 kW	(or 0.455 % of meter MVA)

Reactive Meters

No reliable figure for the no load reactive compensation is available from the transformer test certificate so suggest that a zero figure is used on the meters.

The on load reactive loss of the power transformer is, 34.93 MVAR (see below)

This loss converted to the meter combined rating is $34.93 \times (1.3616) = 47.56 \text{ MVAR}$

The loss to be applied to each meter is, 23.78 MVAR (or 21.45 %)

SGT1									
SIEMENS TRANSFORMER									
S/n 110791						ELEXON formula			
<div> <ul style="list-style-type: none"> $FLVCu_{test} = \sqrt{\left(VA_{test} * \frac{\%Impedance}{100}\right)^2 - (FLWCu_{test})^2}$ <p>$FLVCu_{test}$ is the full load vars lost in the power transformer's copper windings under test conditions.</p> </div>									
	VA _{test} =		190	MVA					
	%Impedance =		18.39	from page 7 of cert					
	FLWC _{test} =		739.7	kW					
		p1=	1.22E+15						
		p2=	5.47E+11						
		p1-p2=	1.22E+15						
		FLVCu=	34933.17	kVAR					