GENERATOR SET
CAPABILITY CURVE

REAL POWER
p.u. KW

VOLTAGE INSTABILITY REGION

ALTERNATOR OUTPUT (STATOR CURRENT)
LIMITED BY STATOR HEATING AND VOLTAGE INSTABILITY AT LEADING POWER FACTORS

ALTERNATOR OUTPUT (STATOR CURRENT)
LIMITED BY ENGINE POWER AT POWER FACTORS ABOVE 0.8

ALTERNATOR OUTPUT (STATOR CURRENT)
LIMITED BY STATOR HEATING (ALTERNATOR RATED OUTPUT)

ALTERNATOR OUTPUT (STATOR CURRENT)
LIMITED BY ROTOR HEATING AT POWER FACTORS BELOW 0.8

UNIY POWER FACTOR

ENGINE KW LIMIT LINE

LOW POWER FACTOR RESULTS
IN THE ALTERNATOR BEING UNDER-EXCITED - LOW ROTOR (FIELD) CURRENT

LEADING POWER FACTOR RESULTS
IN THE ALTERNATOR BEING OVER-EXCITED - HIGH ROTOR (FIELD) CURRENT

LOW ROTOR (FIELD) CURRENT LEADS TO STATOR END IRON HEATING

HIGH ROTOR (FIELD) CURRENT LEADS TO HEATING IN THE ROTOR WINDINGS

GENERATOR SET OPERATING RANGE SHOWN BOUNDED BY THE BLUE LINE

ALTERNATOR THEORETICAL CAPABILITY CURVE

REACTIVE POWER
p.u. KVAR (leading)

REACTIVE POWER
p.u. KVAR (lagging)

REAL POWER
p.u. KVAR (lagging)

VAR IMPORT

VAR EXPORT

0.8 pf LAGGING

KVAR

KVA