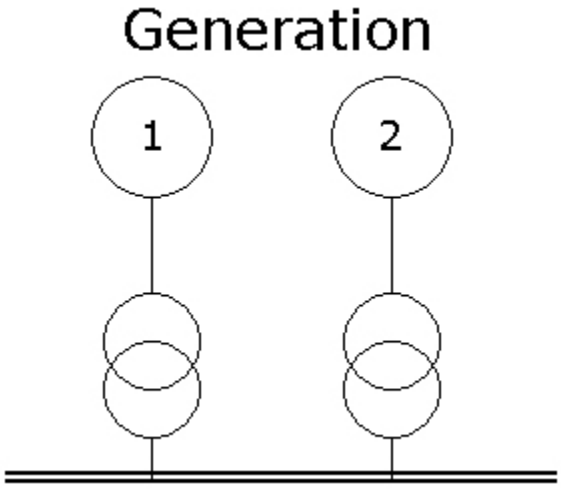
Area Totals" through Section 14.12, "Summarizing Zone-to-Zone Interchange") and for shunt scaling purposes (refer to SCAL).

The admittance specified in the data record can represent a shunt capacitor or a shunt reactor (both with or without a real component) or a shunt resistor. It *must not* represent line connected admittance, switched shunts, loads, line charging or transformer magnetizing impedance, all of which are entered in other data categories.

1.10. Generator Data

Each network bus to be represented as a generator or plant bus in PSSE must be specified in a generator data record. In particular, each bus specified in the bus data input with a Type code of 2 or 3 must have a generator data record entered for it.



RAW Record Format (on single line)

```
I, ID, PG, QG, QT, QB, VS, IREG, NREG, MBASE, ZR, ZX, RT, XT, GTAP, STAT,
RMPCT, PT, PB, BASLOD, O1, F1, ..., O4, F4, WMOD, WPF
```

RAWX Data Table Format

```
"generator":{
    "fields":["ibus", "machid", "pg", "qg", "qt", "qb", "vs", "ireg", "nreg",
              "mbase", "zr", "zx", "rt", "xt", "gtap", "stat", "rmpct",
              "pt", "pb", "baslod", "o1", "f1", "o2", "f2", "o3", "f3", "o4",
              "f4", "wmod", "wpf"],
    "data":[
        [101, "1", 750.0, 165.2, 400.0, -100.0 1.01, 101, 0, 900.0, 0.01,
         0.3, 0.0, 0.0, 1.0, 1, 100.0, 800.0, 50.0, 0, 1, 0.1289, 2, 0.2524,
         3, 0.1031, 4, 0.5156, 0, 1.0],
```

```
        ...

        [3018, "2", 100.0, -0.157, 75.0, -75.0, 0.99, 3018, 0, 120.0, 0.024,
         0.36, 0.0, 0.0, 1.0, 1, 92.5, 110.0, 20.0, 0, 1, 0.3003, 2, 0.1358,
         3, 0.2857, 4, 0.2782, 0, 1.0]
    ]
}
```

Field	RAWX Key	Description
I	ibus	Bus number, or extended bus name enclosed in single quotes (refer to Extended Bus Names). No default allowed
ID	machid	One- or two-character uppercase non-blank alphanumeric machine identifier used to distinguish among multiple machines at bus I. It is recommended that, at buses for which a single machine is present, the machine be designated as having the machine identifier '1'. ID = '1' by default
PG	pg	Generator active power output; entered in MW. PG = 0.0 by default
QG	qg	Generator reactive power output; entered in Mvar. QG needs to be entered only if the case, as read in, is to be treated as a solved case. QG = 0.0 by default
QT	qt	Maximum generator reactive power output; entered in Mvar. For fixed output generators (i.e., nonregulating), QT must be equal to the fixed Mvar output. For infeed machines (WMOD=4), QT is not used in powerflow calculations. The reactive power output of infeed machines is held constant at QG. QT = 9999.0 by default
QB	qb	Minimum generator reactive power output; entered in Mvar. For fixed output generators, QB must be equal to the fixed Mvar output. For infeed machines (WMOD=4), QB is not used in powerflow calculations. The reactive power output infeed machines is held constant at QB = -9999.0 by default.
VS	vs	Regulated voltage setpoint; entered in pu. VS = 1.0 by default
IREG	ireg	Bus number, or extended bus name enclosed in single quotes, of the bus for which voltage is to be regulated by this plant to the value specified by VS. If IREG specifies a remote bus (i.e., a bus other than bus I), bus IREG must be a Type 1 or 2 bus (if it is other than a Type 1 or 2 bus, bus I regulates its own voltage to the value specified by VS). IREG may be entered as zero if the plant is to regulate its own voltage. If bus I is a Type 3 (swing) bus, IREG must *not* specify a remote bus. IREG = 0 by default
NREG	nreg	A node number of bus IREG. The bus section of bus IREG to which node NREG is connected is the bus section for which voltage is to be regulated by this plant

Field	RAWX Key	Description
		to the value specified by VS. If bus IREG is not in a substation, NREG must be specified as 0. NREG = 0 by default
MBASE	mbase	Total MVA base of the units represented by this machine; entered in MVA. This quantity is not needed in normal power flow and equivalent construction work, but is required for switching studies, fault analysis, and dynamic simulation. MBASE = system base MVA by default
ZR,ZX	zr,zx	Complex machine impedance, ZSORCE; entered in pu on MBASE base. This data is not needed in normal power flow and equivalent construction work, but is required for switching studies, fault analysis, and dynamic simulation. For dynamic simulation, this impedance must be set equal to the unsaturated subtransient impedance for those generators to be modeled by subtransient level machine models, and to unsaturated transient impedance for those to be modeled by classical or transient level models. For short-circuit studies, the saturated subtransient or transient impedance should be used. ZR = 0.0 and ZX = 1.0 by default
RT,XT	rt,xt	Step-up transformer impedance, XTRAN; entered in pu on MBASE base. XTRAN should be entered as zero if the step-up transformer is explicitly modeled as a network branch and bus I is the terminal bus. RT + jXT = 0.0 by default
GTAP	gtap	Step-up transformer off-nominal turns ratio; entered in pu on a system base. GTAP is used only if XTRAN is non-zero. GTAP = 1.0 by default
STAT	stat	Machine status of one for in-service and zero for out-of-service; STAT = 1 by default
RMPCT	rmpct	Percent of the total Mvar required to hold the voltage at the bus controlled by bus I that are to be contributed by the generation at bus I; RMPCT must be positive. RMPCT is needed only if there is more than one local or remote setpoint mode voltage controlling device (plant, switched shunt, FACTS device shunt element, or VSC dc line converter) controlling the voltage at bus IREG. RMPCT = 100.0 by default
PT	pt	Maximum generator active power output; entered in MW. PT = 9999.0 by default
PB	pb	Minimum generator active power output; entered in MW. PB = -9999.0 by default
BASLOD	baslod	Base loaded flag; • = 0 Normal, the machine is not base loaded

Field	RAWX Key	Description
		• = 1 Down only; the machine can be scaled down but will not be scaled for any increase in generation • = 2 Neither up nor down; the machine can be scaled neither up nor down • = 3 Up only; the machine can be scaled up but will not be scaled for any decrease in generation BASLOD = 0 by default
Oi	o1, o2, o3, o4	Owner number (1 through 9999). Each machine may have up to four owners. By default, O1 is the owner to which bus I is assigned (refer to Bus Data) and O2, O3, and O4 are zero.
Fi	f1, f2, f3, f4	Fraction of total ownership assigned to owner Oi; each Fi must be positive. The Fi values are normalized such that they sum to 1.0 before they are placed in the working case. By default, each Fi is 1.0.
WMOD	wmod	Machine control mode; WMOD is used to indicate whether a machine is a conventional or a non-conventional machine (e.g. renewables, infeed) machine, and, if it is, the type of reactive power limits to be imposed. Non-conventional machines are renewables (e.g., wind, PV etc.) and infeed machines (for definition of infeed machines, see description below of WNMOD=4) 0 - a conventional machine (e.g. synchronous machines). 1 - renewable type machine for which reactive power limits are specified by QT and QB. 2 - renewable type machine for which reactive power limits are determined from the machine's active power output and WPF; limits are of equal magnitude and opposite sign 3 - renewable type machine with a fixed reactive power setting determined from the machine's active power output and WPF; when WPF is positive, the machine's reactive power has the same sign as its active power; when WPF is negative, the machine's reactive power has the opposite sign of its active power. 4 - infeed type machine. An infeed type machine is one for which the machine reactive power (QG) is held constant. The QT and QB limits values are not used and are for information only. QG value has to be between QT and QB. WMOD = 0 by default
WPF	wpf	Power factor used in calculating reactive power limits or output when WMOD is 2 or 3 WPF = 1.0 by default

Generator data input in the RAW file is terminated with a record specifying a bus number of zero.

1.10.1. Reactive Power Limits

In specifying reactive power limits for voltage controlling plants (i.e., those with unequal reactive power limits), the use of very narrow var limit bands is discouraged. The Newton-Raphson based power flow solu-