Re: Small, slow AC machines: surface to volume ratio?

Source: http://sci.tech−archive.net/Archive/sci.physics.research/2005−06/msg00551.html

- *From*: DGoncz@xxxxxxx

- *Date*: Sun, 26 Jun 2005 16:43:08 +0000 (UTC)

To droll on a bit, and expand the discussion:

Clearly a motor is an inductive load. Without argument we may take that a motor is an inductive source, when used as a generator. We're talking AC motors here....

What the hell is an inductive source?

Well, a transformer could be one, but there's this issue of impedance reflection, so let's leave that out and *not* assume a classic linear AC−tranformer−AC−diode−capacitor power supply is an inductive source.

I do know one motor sucks at driving another, so we'll just go with that. An inductive source is one which "doesn't like" inductive loads. And so we may presume it does like resistive or capacitive loads.

Now, universally, what is done with an AC induction motor to turn it into an SEIG is "to slap some caps on it". This is power factor correction, making the generator system more happy with resistive loads, which predominate.

How does this work?

Well, I understand resonance and I think I have a pretty good explanation:

The stator winding inductance and slapped on capacitor bank need to form a *resonant tank* with frequency "somewhat less" than the frequency desired.

How much less? Or, a better question, why *less* and not *more*?

Oh, that's easy....

The driving source, the prime mover, is essentially along the X axis. And output, a function of resonance, is along Y.

Now, what do you *not* want a generator to do when you load it?

You *don't* want it to sag, that is, lower its output. And that is precisely what will happen if you're operating on the low−frequency, inductive side of the Q curve:

A little load, a little less speed (conservation of power or energy). A little less speed, a little *less* output. A little less output, well, you get the idea. dy/dx > 1.

A positive feedback system, right? Remove the load, it overspeeds, blowing out the prime mover. Add load, it sags, stalling or lugging the prime mover.

So what happens on the other side?

Easy. Negative feedback. dy/dx < 1.

More later....

Doug

.

- ***Follow−Ups***:
  - ♦ ***Re: Small, slow AC machines: surface to volume ratio?***
    - ◊ *From:* DGoncz

- ***References***:
  - ♦ ***Small, slow AC machines: surface to volume ratio?***
    - ◊ *From:* DGoncz

- Prev by Date: ***Re: A question of discrete space−time, part 3***
- Next by Date: ***Re: Time, Parameter, Operator***
- Previous by thread: ***Small, slow AC machines: surface to volume ratio?***
- Next by thread: ***Re: Small, slow AC machines: surface to volume ratio?***
- Index(es):
  - ♦ ***Date***
  - ♦ ***Thread***