



Minutes of meeting between M/s BHEL Ltd and M/s Innovative Tehnomics Pvt Ltd (ITPL), Pune held on 9/3/2006 at B.H.EL, Ramachandrapuram.

Persons Present

B.H.E.L

E.Ramulu SrDGM (Testing)
B G Gadhwe, DGM (Testing)
T V Rao (Senior Manager, Testing)

ITPL

P R Deo, Director
M A Kulkarni (CEO, Lecon systems)
Girisimha (Mktg Engineer, Lecon)

ITPL engineers reported to the site on 2nd of March 2006 to commission FCMA Soft starter designed for starting a string consisting of 11 KV, 13 MW Synchronous Motor, Voith (Vorecon) coupling and Compressor. The details of the string are listed below:

Motor Details:

13MW 11KV 4pole synchronus motor, B.H.E.L make.
Full load current: 775 Amps
Efficiency: 97.8%
PF: 0.9 (lead)
Excitation Voltage: 136V
Excitation current: 556Amps

Voith (vorecon) coupling Details:

Type: - RWE 14F8
SL no: - 8200151
Year built:-2005
Out put power:-11500Kw
Input speed:-1500RPM
Max continuous speed: - 9269RPM

Compressor:

BHEL make
Type no BCL-503/5
Natural -Gas Lift Compresor
PDO Yibal (Oman)

FCMA Soft Staarter:

Job no: J -2177
Model no: - NSC1- 14800 KW /11kV (extendable to 20000 KW/11kV)



This being a large drive B.H.E.L has recorded the Motor Voltage and current waveforms during the acceleration of the motor.

1. Motor decoupled trial – Motor was accelerated to full speed using FCMA soft starter and following readings were observed

- a. Motor starting current 1000 Amps
- b. Motor starting time 10 secs
- c. Soft starter by pass time – 38 Secs
- d. Motor No load current on full speed in Asynchronous mode -100Amps
- e. Motor was synchronized immediately after bypass and operation was smooth with out any current kicks
- f. Recorded waveform during the start, Soft starter Bypass and Synchronization show sinusoidal waveform without voltage Transients, surges or harmonics

2. The tap setting of the FCMA soft starter was adjusted to get the starting current of 1200Amps

3. Motor coupled trial – Motor was accelerated to full speed using FCMA soft starter and following readings were observed

- a. Motor starting current 1200 Amps
- b. Motor starting time 28 seçs
- c. Soft starter By pass time – 38 Secs
- d. Motor current on full speed in Asynchronous mode – 150Amps
- e. Motor was synchronized immediately after bypass and operation was smooth with out any current kicks.
- f. Recorded waveform during the start, Soft starter Bypass and Synchronization show sinusoidal waveform without voltage Transients, surges or harmonics
- g. The String was put in operation for more than 7 hours continuously and the operation was satisfactory.

So far 12 starts are taken with FCMA soft starter to start 13 MW Motor. FCMA soft starter is successfully commissioned and I.T.P.L thanks B.H.E.L Engineers and senior managers for the support during the commissioning. ITPL has agreed to depute their engineers for commissioning of 14.8 MW /11kV motor also.

I.T.P.L engineers left the site on 9th of March 2006.

BHEL (HYD)
T. VASUDEVA RAO
टी. वासुदेव राव
Senior Manager (Testing)
वरिष्ठ परीक्षक (परीक्षण)
BHEL, R.C.PURAM, HYD-32.

M.A. Kulkarni
ITPL (PUNE)
(Lecan Systems)
Girisimha. (Lecan)