MOTOR ACCELERATION STUDY
Unified Data Collection Checklist

What is this form?

This checklist captures all data our engineers need to perform a Motor Acceleration Study for your site covering starting voltage dips, acceleration time, torque analysis, and starting method evaluation. Provide as much as you can; estimates are fine, mark them as 'approx.'

- Attach motor datasheets, speed-torque curves, and cable schedules.
- Partial data is always helpful our engineer will follow up on gaps.
- All information is treated as strictly confidential.

Your Contact Details

Company / Organization: _____

Site Name & Address: _____

Your Name & Role : _____

Email Address : _____

Phone Number: _____

Date Completed: _____

A. SYSTEM OVERVIEW

Supply Voltage at Motor Bus (V / kV) *e.g. 415 V / 6.6 kV / 11 kV*	**System Frequency (Hz)** *e.g. 50 Hz / 60 Hz*
Utility / Grid Fault Level at Supply Bus *e.g. 250 MVA / 13.1 kA at 11 kV bus*	**Source Impedance (Z, R, X) if known** *e.g. Z = 0.045 + j0.38 Ω from utility or study*
Supply Bus Type *e.g. Infinite bus / Generator bus / Weak grid (DG only)*	**Applicable Standards** *e.g. IEC 60034, NEMA MG-1, IEEE 399, local utility spec*
SLD Available? *Yes attach / Partial / No*	**Existing Motor Starting Study?** *Yes attach / No*

B. MOTOR DATA (complete one row per motor attach datasheets if available)

Motor Tag	Application / Driven Equipment	kW / HP Rating	Voltage (V/kV)	Full Load Current (A)	Locked Rotor Current (×FLC)	Power Factor (FL)	Rated Speed (RPM)	Efficiency (%)	Notes
e.g. M-01									

C. MOTOR MECHANICAL & INERTIA DATA

Motor Tag	Rotor Inertia Motor (kg·m²)	Load Inertia (kg·m²)	Load Torque Type	Load Torque at Start (% rated)	Load Torque at Full Speed (% rated)	Notes / Source
e.g. M-01						

Load Torque Type Key:
Constant = Conveyors, constant load | Square-law = Fans, pumps, centrifugal | Linear = Compressors, mixers | High-inertia = Flywheels, mills

D. STARTING METHOD & CONTROL EQUIPMENT

Motor Tag	Starting Method	Starter Brand / Model	Starting Voltage or Torque Setting	Ramp-Up Time Setting (s)	Max Starts per Hour	Notes
e.g. M-01						

Starting Method Key:
DOL = Direct On-Line | SS = Soft Starter | VFD = Variable Frequency Drive | SD = Star-Delta | ATL = Auto-Transformer | PR = Part Winding

Are Motors Started Sequentially or Simultaneously?
e.g. Sequential with 30 s delay / Simultaneously 2 motors

Any Interlocking or Process Sequence Constraints?
e.g. Pump must reach speed before valve opens

VFD Present Brand & Model
e.g. ABB ACS880 / Siemens G120 / Not applicable

VFD Output Filter Type
e.g. dU/dt filter, sine filter / None / Not known

E. SUPPLY CABLE & TRANSFORMER DATA

Cable / Feeder Ref	From	To	Length (m)	Size (mm²) / Type	R (Ω/km)	X (Ω/km)	Notes
e.g. C-01							

Dedicated Transformer for Motor(s)?
Yes tag, kVA, %Z / No (shared MDB)

Transformer kVA Rating & % Impedance
e.g. 1000 kVA, Z = 5.5%, Dyn11

Other Loads on Same Bus During Starting
e.g. 200 kW process loads remain energised

Bus Capacitors / PF Correction Present?
Yes kVAR rating / No

F. PROTECTION & STARTING DEVICES

Motor Tag	Device Tag	Device Type	Rating / Setting (A)	Trip / Stall Time (s)	Overload Relay Class	Manufacturer / Model	Notes

e.g. M-01							

G. OPERATING CONDITIONS & SCENARIOS TO MODEL

Tick all scenarios to be included in the motor acceleration study:

☐ Normal operation motor starting on full supply	☐ Weak grid condition DG/generator as sole source
☐ Maximum fault level (stiff grid)	☐ Minimum fault level (generator only / islanded)
☐ Single motor starting (standby start)	☐ Simultaneous starting of multiple motors
☐ Sequential starting with process time delays	☐ Automatic restart after power dip or outage
☐ Starting under load (loaded start pump, compressor)	☐ No-load start followed by load application
☐ Star-delta transition transient assessment	☐ Soft starter bypass / VFD bypass switching
☐ Motor starting with capacitor bank in service	☐ Motor starting with capacitor bank disconnected
☐ N-1 scenario one source transformer out of service	☐ Other describe below

Additional scenario details / constraints *Sequence of events, process interlocks, bus topology during starting...*	**Starting Frequency** *e.g. Once per shift / Daily / On process demand*	**Acceptable Voltage Dip Limit (%)** *e.g. ≤15% at motor terminal / ≤10% at sensitive bus*

H. PROBLEMS & SYMPTOMS OBSERVED

Tick all that apply even infrequent events help scope the study correctly:

☐ Motor fails to start or stalls under load	☐ Voltage dip causing other equipment to trip
☐ Lights flicker or dim during motor start	☐ PLC / DCS / instruments dropout on motor start
☐ Motor overheats during starting	☐ Excessive starting time (motor sluggish)
☐ Soft starter or VFD faulting on start	☐ Star-delta contactor or breaker tripping on start
☐ Generator trips or AVR hunts on motor start	☐ Capacitor bank trips or blows fuses on start
☐ Production stoppages from failed motor starts	☐ Other describe below

Describe the problem in your own words *Which motor, what happens, how often, any production or equipment damage...*	**When did problems start?** *e.g. After 2022 motor upgrade / Always been an issue*

I. EXISTING DATA & DOCUMENTS (tick what you can share)

☐ Single Line Diagram (SLD) any revision	☐ Motor nameplate photograph or datasheet
☐ Motor speed-torque curve (from manufacturer)	☐ Motor locked rotor current & starting curve

☐ Soft starter / VFD technical datasheet	☐ Overload relay / protection device datasheet
☐ Cable schedule or impedance data	☐ Transformer nameplate / test certificate
☐ Previous motor starting study or report	☐ Fault level / short-circuit study report
☐ Power quality measurements (voltage dip recordings)	☐ Generator / DG set technical datasheet (if applicable)
☐ Oscillography or SCADA waveforms from failed starts	☐ Photographs of MCC / starter panel / motor
☐ Utility interconnection data or requirements	☐ Other describe below

J. STUDY OBJECTIVES & SCOPE

Tick your top priorities for this engagement:

☐ Calculate motor acceleration time for each scenario	☐ Determine voltage dip magnitude & duration at key buses
☐ Evaluate & compare starting methods (DOL vs SS vs VFD)	☐ Verify motor can start successfully under all scenarios
☐ Assess impact of motor start on other connected loads	☐ Check starting torque vs load torque throughout acceleration
☐ Verify protection settings (overload, stall) are appropriate	☐ Identify causes of failed starts or tripping
☐ Comply with utility voltage dip / flicker requirements	☐ Recommend optimal starting method or mitigation measure
☐ Prepare documentation for permit / utility submission	☐ Other describe below

Most important goal / successful outcome *What does a successful result look like for your operation?*	**Deadline / Timeline?** *e.g. Commissioning in 8 weeks / Utility deadline / No fixed date*

COMPANY NAME

Full Name: _____
Signature: _____
Date: _____

What Happens Next

Our engineer will review your form shortly and contact you.