

Standard RE/FiT Telemetry Pre-commissioning Report Template (Sample)

1. Applicant should provide following in the Telemetry Report for CLP assessment:
 - a. Telemetry Requirement (provided by CLP)
 - b. Wiring Diagram
 - c. Measuring Point(s) Details
 - d. Method Statement for Secondary Injection Test (with equipment setup and power meter & DDC interfacing details) and Real Time Generation
 - e. Self-Test Results (at least 5 samples for each analog signals per $\pm$ sign)
 - f. Telemetry Results During Witness of Site Test (to be updated after CLP Witness of site test)
 - g. Appendix I: Photos of Self-Test (for required analog signals in kW, kVar, Amp & kV, and digital signals in circuit breaker status, etc.)
 - h. Appendix II: Photos of Equipment
 - i. Appendix III: Excel of Telemetry Test Results (Telemetry test results input template )
2. Applicant should confirm that the analog signal is come from Direct Digital Controller (DDC) instead of CT.
3. Template of the telemetry results for Self-Test (see below example & text in red)

- a. Secondary Injection test (analog signal error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$):

Secondary Injection Point	Equivalent Inject Power	Output Signal limit at interfacing point (a)	Actual Signal measured at interfacing point (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$)
Supply Point^ (Export Power to CLP)	+ 1500kW [#]	+ 10mA	+ 9.9mA	-1% or -0.1mA	Pass or Fail
Supply Point^ (Import Power from CLP)	- 1500kW [#]	- 10mA	- 9.9mA	-1% or 0.1mA	Pass or Fail
Supply Point^ (Export Power to CLP)	+ 750kVar [#]	+ 10mA	+ 9.9mA	-1% or -0.1mA	Pass or Fail
Supply Point^ (Import Power from CLP)	- 750kVar [#]	- 10mA	- 9.9mA	-1% or 0.1mA	Pass or Fail
RE Outlet (Generation)	+ 500kW ^{##}	+ 3.33mA	+ 3.34mA	0.2% or 0.01mA	Pass or Fail
RE Outlet (Generation)	- 500kW ^{##}	- 3.33mA	- 3.34mA	0.2% or -0.01mA	Pass or Fail
RE Outlet (Generation)	+ 250kVar ^{##}	+ 3.33mA	+ 3.34mA	0.2% or 0.01mA	Pass or Fail
RE Outlet (Generation)	- 250kVar ^{##}	- 3.33mA	- 3.34mA	0.2% or -0.01mA	Pass or Fail
Secondary Injection Point	Equivalent Inject Current	Output Signal limit at interfacing point (a)	Actual Signal measured at interfacing point (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$)
Supply Point^	2500A [*]	+ 10mA	+ 9.9mA	-1% or -0.1mA	Pass or Fail
Secondary Injection Point	Equivalent Inject Voltage	Output Signal limit at interfacing point (a)	Actual Signal measured at interfacing point (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$)
Supply Point^	400V [*]	+ 10mA	+ 9.9mA	-1% or -0.1mA	Pass or Fail
CB Status^	Open		Close		
Supply Point	Pass or Fail		Pass or Fail		

Remarks:

^ Telemetry signal is required at Supply Point if RE generation capacity > local demand

[#] Inject Power is in accordance with 1.5MVA 11k/380V transformer power export/import limit (In this example: Telemetry requirement for transducer characteristics: $\pm 1500\text{kW}$ corresponds to $\pm 10\text{mA}$ and $\pm 750\text{kVar}$ corresponds to $\pm 10\text{mA}$)

^{##} Inject Power is in accordance with RE capacity, i.e. 500kW in this example (In this example: Telemetry requirement for transducer characteristics: $\pm 1500\text{kW}$ corresponds to $\pm 10\text{mA}$ and $\pm 750\text{kVar}$ corresponds to $\pm 10\text{mA}$)

^{*} In this example: Telemetry requirement for transducer characteristics: 2500A corresponds to +10mA and 400V corresponds to +10mA

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4. Template of the telemetry results for End-to-End checking with CLP's System Operation during witness of site test (see below example & text in red)

a. Secondary Injection Test (analog signal error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$):

Secondary Injection Point	Equivalent Inject Power	Output Signal limit at interfacing point (a)	Actual Signal received by CLP's System Operation (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$)
Supply Point^ (Export Power to CLP)	+ 1500kW	+ 10mA	+ 9.97mA	-0.33% or -0.03mA	Pass or Fail
Supply Point^ (Import Power from CLP)	- 1500kW	- 10mA	- 9.96mA	-0.4% or 0.04mA	Pass or Fail
Supply Point^ (Export Power to CLP)	+ 750kVar	+ 10mA	+ 9.93mA	-0.67% or -0.07mA	Pass or Fail
Supply Point^ (Import Power from CLP)	- 750kVar	- 10mA	- 9.95mA	-0.53% or 0.05mA	Pass or Fail
RE Outlet (Generation)	+ 500kW	+ 3.33mA	+ 3.31mA	-0.60% or -0.02mA	Pass or Fail
RE Outlet (Generation)	- 500kW	- 3.33mA	- 3.31mA	-0.60% or 0.02mA	Pass or Fail
RE Outlet (Generation)	+ 250kVar	+ 3.33mA	+ 3.31mA	-0.80% or -0.03mA	Pass or Fail
RE Outlet (Generation)	- 250kVar	- 3.33mA	- 3.31mA	-0.80% or 0.03mA	Pass or Fail
Secondary Injection Point	Equivalent Inject Current	Output Signal limit at interfacing point (a)	Actual Signal received by CLP's System Operation (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$)
Supply Point^	2500A	+ 10mA	+ 9.9mA	-1% or -0.1mA	Pass or Fail
Secondary Injection Point	Equivalent Inject Voltage	Output Signal limit at interfacing point (a)	Actual Signal received by CLP's System Operation (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 1\%$ or $\leq \pm 0.1\text{mA}$)
Supply Point^	380V	+ 10mA	+ 9.9mA	-1% or -0.1mA	Pass or Fail
CB Status^	Actual Signal received by CLP's System Operation - Open		Actual Signal received by CLP's System Operation - Close		
Supply Point	Pass or Fail		Pass or Fail		

b. Real Time Generation (analog signal error $\leq \pm 5\%$ or $\leq \pm 0.5\text{mA}$):

Real Time Generation	Actual Power Output	Output Signal limit at interfacing point (a)	Actual Signal received by CLP's System Operation (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 5\%$ or $\leq \pm 0.5\text{mA}$)
Supply Point^ (Import Power from CLP)	- 1000kW	- 6.67mA	- 6.5mA	-0.3% or 0.02mA	Pass or Fail
Supply Point^ (Import Power from CLP)	- 600kVar	- 8mA	- 8.3mA	3.67% or -0.3mA	Pass or Fail
RE Outlet (Generation)	+ 100kW	+ 0.67mA	+ 0.77mA	15% or 0.1mA	Pass or Fail
RE Outlet (Generation)	- 10kVar	- 0.133mA	- 0.153mA	15% or -0.02mA	Pass or Fail
Real Time Generation	Equivalent Inject Current	Output Signal limit at interfacing point (a)	Actual Signal received by CLP's System Operation (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 5\%$ or $\leq \pm 0.5\text{mA}$)
Supply Point^	2000A	+ 8mA	+ 7.6mA	-5% or -0.4mA	Pass or Fail
Real Time Generation	Equivalent Inject Voltage	Output Signal limit at interfacing point (a)	Actual Signal received by CLP's System Operation (b)	error = (b-a)/a*100% or error = (b-a)	Remarks (error $\leq \pm 5\%$ or $\leq \pm 0.5\text{mA}$)
Supply Point^	380V	+ 9.5mA	+ 9.4mA	-1.05% or -0.1mA	Pass or Fail
Real Time CB Status^	Actual Signal received by CLP's System Operation - Open		Actual Signal received by CLP Control Centre - Close		
Supply Point	Pass or Fail		Pass or Fail		

Remarks:

^ Telemetry signal is required at Supply Point if RE generation capacity > local demand

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