RELIABILITY & H.V. EQUIPMENT DEPARTMENT

RAMs REQUIREMENTS FOR 170 KV AIS CURRENT TRANSFORMERS (OIL INSULATED)

1. RAMs REQUIREMENT

RELIABILITY, AVAILABILITY, MAINTAINABILITY and Safety (RAMs) for 170KV CURRENT TRANSFORMER Oil insulation:

1.1. Reliability

The Bidder shall present the reliability tasks and methods which are used to improve the design for reliability and evaluate the MTTF/MTBF for (*) **Major Failures** only, of the 170 kV Current Transformer oil insulated components.

The Bidder shall provide expected values for the relevant parameters of the 170 kV Current Transformer components and shall add their distribution whenever possible.

1.2. Failure Analysis

From his Failure Reporting Analysis and Corrective Action System (FRACAS), Bidder shall present a failure report and the analysis of the failures which occurred during the service life of similar 170 kV Current Transformer oil insulated components **manufactured by him**. The report should include the withdrawn conclusion and the corrective actions subsequently undertaken.

***Major failure:** Failure of a Transformer which causes the cessation of one or more of it's fundamental functions.

A major failure will result in an immediate change in the system operating conditions,

e.g the backup protective equipment will be required to remove the fault or will result in mandatory removal from service within 30 minutes for unscheduled maintenance.

1.3. 170 kV Current Transformer oil insulated RAM DATA

Bidder shall submit the following 170 kV Current Transformer oil insulated RAM data:

Table 1: Current Transformer oil insulated components RAM parameters of similar construction of ratings

Component	MTBF (Yrs)	EOL (Yrs)	MTTR (Hrs)
1. Inductive Current Transformer			
1.1. Main internal insulation (e.g. oil)			
1.2. Core			
1.3. Insulator (e.g. porcelain / composite)			
1.4. Sealing (e.g. gasket, valve)			
1.5. Painting			

Where:

MTBF: Mean Time Between Failures, For
*Major Failure EOL: Expected Operating Life.

MTTR: Mean Time To Repair, for *Major Failures.

1.4. Field Data

The bidder will fill the following table:

Table 3: Field Demonstrated RAM data for similar construction and ratings Current Transformers

Field RAM Data	Current Year	- 1 [years]	- 2 [years]	- 3 [years]	- 4 [years]	- 5 [years]	- 6 [years]	- 7 [years]	- 8 [years]	- 9 [years]
Total number of installed CTs										
Major Failures										
Specific Part which undergoes Major Failure	**internal insulation**									
	Core									
	Insulator									
	Sealing									
	Other									
Mean Time to Repair/Replace										

1.5. Unreliability Demonstration Procedure (UDP)/Reliability Test

NOGA-ISO could conduct an Unreliability Demonstration Procedure (UDP)/Reliability Test, according to NOGA-ISO Judgement. The manufacturer may request NOGA-ISO to see example for a UDP. The final UDP could be changed according to each individual case and circumstances, as to be decided by NOGA-ISO.