

RELIABILITY & H.V. EQUIPMENT DEPARTMENT

RAMs Requirements For 161 kV DISCONNECTORS

A. REIABILITY, AVAILABILITY, MAINTAINABILITY and Safety (RAMs) for AIS DISCONNECTORS

a. **Reliability**

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

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

b. **Failure Analysis**

From this 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 DISCONNECTORS manufactured by him. The report should include the withdrawn conclusion and the corrective actions subsequently undertaken.

(*)IEC 62271-1 3.1.12

major failure (of switchgear and controlgear) failure of switchgear and controlgear which causes the cessation of one or more of its fundamental functions Note 1 to entry: A major failure may result in an immediate change in the system operating conditions, for example, the backup protective equipment will be required to remove the fault or will result in mandatory removal from service within 30 min for unscheduled maintenance.

c. 170 kV DISCONNECTORS RAM DATA

Bidder shall submit the following 170 kV DISCONNECTORS RAM data:

Table 1: DISCONNECTORS Components RAM parameters of similar construction and ratings:

Component (Centre Break Disconnecter)	MTBF (Yrs)	EOL (Yrs)	MTTR (Hrs)
Operating mechanism			
Main contacts			
Earthing switch contacts			
Guaranteed Frequency of Occurrence between insulator pollution flashover events			

Where:

MTBF: Mean Time between Failures (for *Major Failures).

EOL: Expected Operating Life.

MTTR: Mean Time to Repair (for *Major Failures).

d. Field Data

The bidder will fill the following table:

Table 2: Field Demonstrated Ram Data for 170 kV DISCONNECTORS (last 9 years)

Field RAM Data		-1 [years]	-2 [years]	-3 [years]	-4 [years]	-5 [years]	-6 [years]	-7 [years]	-8 [years]	-9 [years]
Total number of installed DISC's										
Total No. of Major Failures										
Specific Part which undergo Major Failure	Operating mechanism									
	Main contacts									
	Earthing switch contacts									
Mean Time to Repair/Replace										

e. Unreliability Demonstration Procedure (UDP)/Reliability Test

NOGA IISO could conduct an Unreliability Demonstration Procedure (UDP)/Reliability Test, according to NOGA IISO's Judgement. The manufacturer may request NOGA to see example for a UDP. The final UDP may change according for a specific individual case and circumstances, as to be decided by NOGA IISO.