J. All analogue signals shall be updated each scan into a dedicated area of data registers.

K. The analogue voltage outputs shall be configurable to default to 0 mA, 4 mA or hold-last-state in the event of a CPU failure.

L. Output signals to 'DUTY' equipment shall not be derived from the same output module as 'STANDBY' equipment performing the same function.

M. Digital outputs used for AC inductive loads shall be fitted with arc suppression devices as close to the load as is practicable.

N. Means shall be provided to allow the disconnection of outputs causing unsafe movements or actions without removing power from the PLC Processor or inhibiting program execution

1.3.22.16 PLC System Failure

A. Provide hardware Watchdog relays driven by digital outputs from the PLC to detect major PLC processor fault, I/O error and low battery fault.

B. Make provision to hard-wire the relay contact to the RTU.

C. PLC's to include facilities to retain the last state of the output modules at the time of the PLC failure. This shall be achieved by means of hardware or software.

D. Failure of an extension or remote rack, sub-system or remote PLC, or communications between units, shall set each bit of the input memory image at a safe state such that failure will not cause unwanted movements or actions to occur.

E. If required by the contract, a ‘Hot-Standby’ processor shall be provided to automatically and bump less take over processor functions in case of primary processor failure.

F. The power (AC and DC) for I/O shall be distributed by the use of suitably rated MCB's. Separate MCB shall be provided for the followings:

   a. PLC and I/O rack power supplies.

   b. External networking or communication etc. if any

   c. Analogue DC power supplies.

   d. Digital 24VDC power supplies.

   e. Digital 110VAC input modules.

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