Influence of highly integrated *Systems on Chips* on the FDIR concepts and practices: The example of SCoC3 within the OSCAR computer

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A system FDIR is the answer to the customer's autonomy and survivability requirements. It is based on principles (hierarchy, time to react, recovery actions…) and on the architecture of the system. The OSCAR Computer uses the highly integrated ScOC3 processor, which integrates on the same component several functions (e.g. TM/TC, processor and standard I/O controllers) that are traditionally segregated in several devices. Due to this integration, FDIR requirements identifying modes of operation where a failed processor should not be involved while keeping a minimal set of function alive (e.g. essential telemetry in safe mode) may be solved at system and architectural level. This presentation will provide the example of the FDIR implementation for the AS250 earth observation platform and how this issue handled.

Moreover, compared to another processor, several FDIR advantages are made possible by the use of SCoC3 which allows:

- a higher processor self failure detection coverage and thus a more appropriate reaction in case of processor failure: self correction or reset or processor reconfiguration to the redundant unit,
- a more powerful CPU which allows implementing monitoring (at equipment or global functional chain or system level) that require processing (less limitation than for other processors which CPU is almost all dedicated to nominal functions),
- the possibility to use the SCoC3 basic functions (processor and inputs/outputs management) independently and to use cross strapping between nominal and redundant SCoC3 for more robustness to SCoC3 failures.

The use of SCoC3 computer therefore does not impact the general FDIR principles and is fully adapted to a system with very stringent FDIR requirements.