

# SSEI Research Task Summary – T8

Task Number: SSEI/T8  
Project Title : Dependable Use of FPGAs  
Research Theme : *Developing Dependable Systems*

Lead Delivery Organisation : University of York

Version : 3



## Objective of Work (why are we doing it ?)

Field-Programmable Gate Arrays (FPGAs) offer considerable advantages for the developers of modern high-integrity systems. They can mitigate the effects of obsolescence, provide more flexible, quickly reconfigured processing platforms and can be used to enhance the survivability and fault-tolerance of systems. The potential of these devices is not yet being fully exploited within MOD, however. One reason for this is a lack of established practice and guidance as to how safety assurance can be achieved for FPGAs.

This task aims to develop industry consensus guidance on the safety assurance of FPGAs in the context of DS 00-56 Issue 4, and to consider the safety and dependability implications of the use of FPGA technology in model-driven development approaches.

## Nature of Work (what is it?)

This task will establish typical use contexts for FPGAs, based on current research and industrial practice, and will provide guidance as to the potential benefits and pitfalls associated with these contexts, in order to inform future procurement decisions. Example application areas include direct compilation of a design onto a device and the use of FPGAs to replace legacy components. Guidance on the safety implications of FPGAs in system development will address both the nature of process and product evidence required to support certification and how the system can be designed for safety and maintainability. A series of design recommendations will be produced, recommending design restrictions to achieve better fault-tolerance in likely failure conditions.

## Outcomes (what will it produce/has it produced ?)

This task will produce three outputs:

- Guidance on potential benefits and safety-related issues concerning the use of FPGAs
- Guidance on verification and certification issues associated with the use of FPGAs, including tool support options and future tooling requirements
- Case study examples of the application of the guidance, across high- and low-integrity systems

Timescales 36-month task, May 2008 to February 2011

### Partners

Related Work SSEI/T13

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