10th International Workshop on the Application of FPGAs in Nuclear Power Plants

FPGA Workshops: A Decade in Review

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10th anniversary of the FPGA workshop

… a time for reflection

… a time to consider accomplishments

… a time to look around to learn from others

… and a time to look to the future

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9th FPGA Workshop - 2016 Lyon, France, hosted by EdF

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8th FPGA Workshop - 2015 Shanghai, China, hosted by SNPAS

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7th FPGA Workshop - 2014 Charlotte, North Carolina USA, hosted by EPRI

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6th FPGA Workshop - 2013 Kirovograd, Ukraine, hosted by Radiy

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5th FPGA Workshop - 2012 Beijing, China, hosted by CNCS

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4th FPGA Workshop - 2011 Chatou, France, hosted EdF

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3rd FPGA Workshop - 2010 Hamilton, Ontario, Canada, hosted by AECL/McMaster University

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2nd FPGA Workshop - 2009 Kirovograd, Ukraine, hosted by Radiy

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1st FPGA Workshop - 2008 Chatou, France, hosted EdF

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Where we started in the nuclear industry…

- FPGA technology new to the nuclear industry
- Experience with microprocessor technology shaped concerns with FPGA technology
- No specific guidance documents or standards for FPGA technology
- Regulatory bodies had to treat FPGA technology as software

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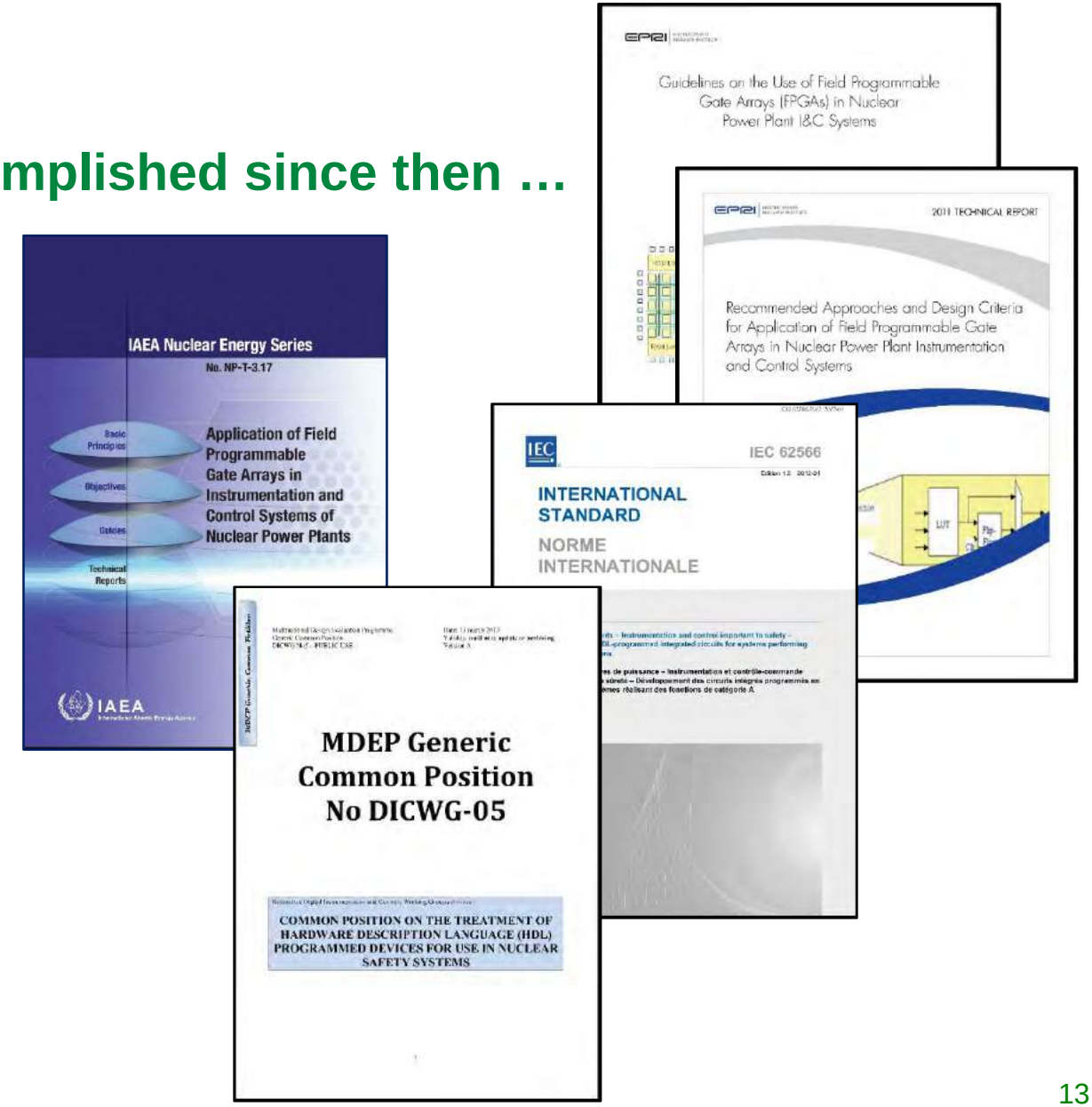
What has been accomplished since then …

- Specific guidance documents and standards for FPGA technology use in the nuclear sector
- Additional standards are in development



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What has been accomplished since then …

- Nuclear industry and regulatory bodies have learned how to treat FPGA technology for safety applications
  - FPGA-based systems installed in nuclear plants in many countries
  - FPGA-based I&C platforms now accepted and available for use
  - FPGA technology provides solutions for common cause failures vulnerabilities based on internal diversity features

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Other trends to watch …

- Other industry sectors have also developed standards for use of FPGA technology in safety-critical applications
  - Driving market towards certified FPGA components and development tools
  - Driving market towards certified products (e.g., IEC 61508 SIL Certification)

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What is being accomplished now …

- Nuclear industry and regulatory bodies are learning how to treat embedded digital technologies like FPGA in smart devices and how to credit certification of FPGA components, development tools, and products

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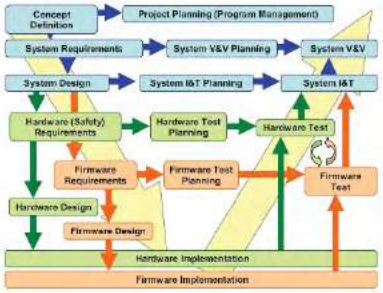
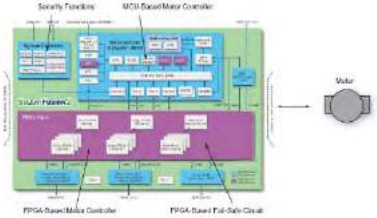
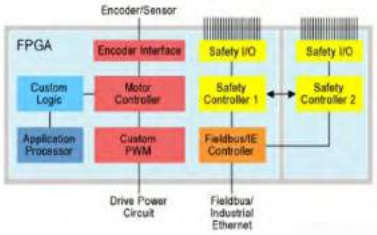
The future for the nuclear sector?

- **Accepted standard development processes and tool flows**



- **Accepted safe integrated solutions for standard industry needs**





- **Realization process improvements through use of certified products**

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Thank you

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