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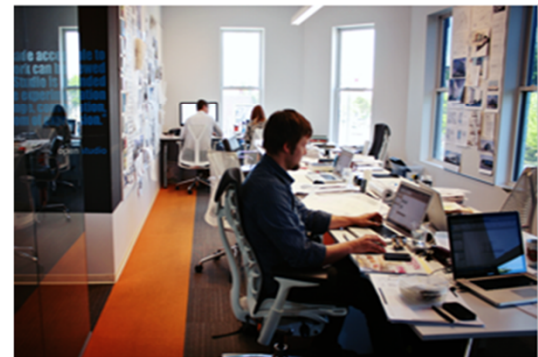
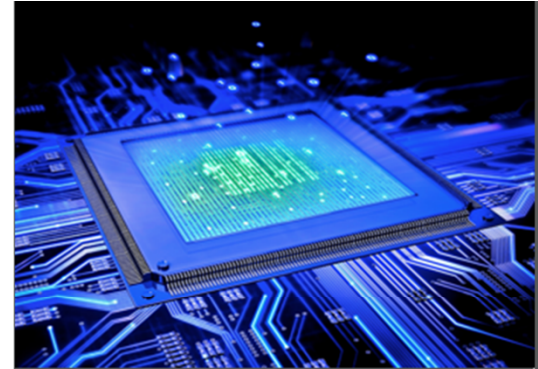
NRIC 2024: HUMAN IN THE LOOP

TOP HFE CHALLENGES & OPPORTUNITIES

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Nuclear Promise X



OUR WHY



Nuclear energy is a key solution to the climate crisis

NPX was founded to deploy innovative solutions that will make nuclear more sustainable, safer, cheaper, faster



NPX IN A NUTSHELL

Our Services are differentiated by **Innovation**

Making nuclear faster, safer, cheaper, *better*.



Supporting Innovation in Nuclear Industry Digital Transformation

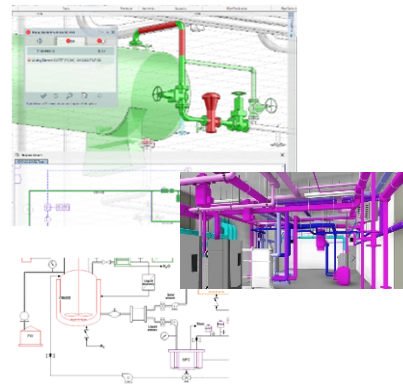
NPX has collaborated with nuclear customers to help modernize & automate processes in the industry. With recent developments in AI technology, step change improvements in software tools can be achieved that will push the industry towards a more cost-effective future.

Rapid Apps & Data



**Developing data-driven tools
improve efficiency of business
processes**

Digital Engineering



**Adopting modern engineering
tools for both existing and new
nuclear applications**

NPX AI



**Large Language models available in
new AI tools allow us to incorporate
context & understanding into data-
driven solutions!**



FUTURE NUCLEAR – HFE CHALLENGE #1

- Lack of drivers, tools and skills needed for cost-effective & timely integration of HFE into modern digital designs and design process
 - Modern innovative tools are also not identified, approved and/or mandated by regulatory bodies (regulation lags even today's HFE practices)
 - Confusion with UX, which tends to be a less controlled discipline in terms of competence in core HF principles and assessment of risks
 - Workload and staffing analysis tools



FUTURE NUCLEAR – HFE CHALLENGE #2

- Lack of ability to accurately identify and understand the nature of HF risks associated with modern digital, remote operated, and AI supported plants
 - 737 MAX, Tesla, ironies of automation
 - Under- and over-estimation of HF risks, and focus on the wrong ones
 - Tendency to lump all SMRs, MMRs into one “low risk” category
 - “Big data” figures out all for the operator → false sense of having true situational awareness compared to having to calculate and understand plant themselves
 - Information overload with work underload



FUTURE NUCLEAR – HFE OPPORTUNITY #1

- Move where HFE is as a profession throughout and beyond the nuclear industry by innovating and leading with new tools & techniques
 - Borrow from Defence acquisition – leverage systems engineering tools and techniques, integrate HFE activities within them
 - Leverage complex systems theory and models
 - Integrate with 3D modelling software, not separate design and software packages specific to HFE

