



Digital Instrumentation & Control – EPRI Role

July 18, 2007

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Acronyms

EPRI	–	Electric Power Research Institute
I&C	–	instrumentation and control
R&D	–	research and development
MCR	–	main control room
PRA	–	probabilistic risk assessment
HFE	–	human factors engineering
ANT	–	advanced nuclear technology
SER	–	safety evaluation report
PLC	–	programmable logic controller
ASIC	–	application specific integrated circuit
FPGA	–	field programmable gate array
CCF	–	common-cause failure

EPRI Digital I&C R&D

- Substantial past/ongoing activities on digital I&C, MCR, risk and human factors
- Guided by extensive utility advisory structure
 - Expertise – I&C, PRA, HFE and ANT
- Several products with SERs
- Basis for industry technical positions
- Areas of information exchange and interaction with NRC

EPRI has substantial expertise and proven capabilities

EPRI R&D on Digital I&C

- Licensing digital upgrades 1992-2004
- Verification & validation 1992-1998
- Electromagnetic interference 1992-
- Commercial devices – PLCs, ASICs, FPGAs, wireless, etc. 1993-
- Control room/human factors 2001-
- Defense-in-depth and diversity 2002-
- Applying risk methods 2002-

Current EPRI Support

- Defense-in-depth and diversity
 - Use design and diversity for CCF protection
- Risk-informed methods
 - Existing methods provide insights to focus design and review efforts
- Human factors
 - Bases for minimum inventory of interfaces, computerized procedures, graded HFE design approach
- Ongoing evaluation of operating experience

Future EPRI Activities

- Interaction with NRC Research has not been as extensive as it could be – we want to help improve this
- Interim Staff Guidance documents are only a start – our advisors expect us to continue to work with NRC to resolve the issues completely