U.S.NRC
United States Nuclear Regulatory Commission
*Protecting People and the Environment*

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# Human Factors Review Guidance Updates

## Objective

Update the detailed human factors engineering (HFE) review criteria contained in NUREG-0711, NUREG-0700, Chapter 18 of NUREG-0800 and improve the usability of the guidance.

## Regulatory Basis

Key Provision: 10 CFR 50.34(f)(2)(iii)

"Provide, for Commission review, a control room design that reflects state-of-the-art human factors principles prior to committing to fabrication or revision of fabricated control room panels and layouts."

## Approach

1. Obtain and Analyze Feedback from Users of HFE Guidance
2. Conduct Literature Review Pertaining to the Use of HFE Guidance
3. Identify NRC Technical Documents to Serve as the Basis for Guidance Updates
4. Obtain Peer Review of Technical Basis Documents
5. Revise the Key HFE Guidance
6. Public Comment
7. Integration and Guidance Publication

## NRC Technical Basis Documents

### RECENT RESEARCH

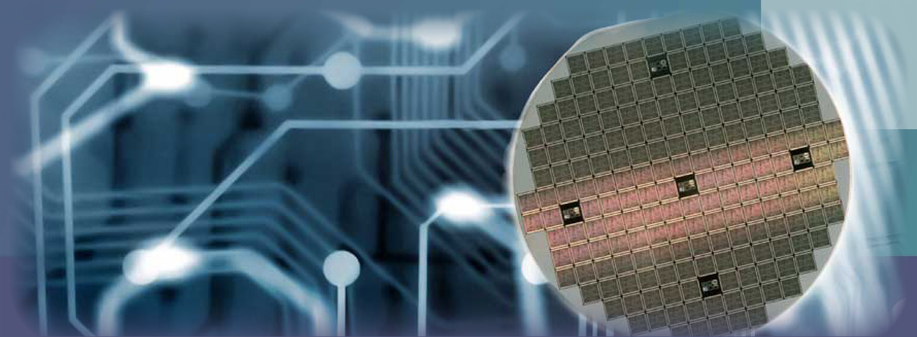
- Human performance models in the design and evaluation of nuclear power plants
- Effects of degraded digital instrumentation and control (I&C) systems on human system interfaces (HSIs) and operator performance
- Guidance for reviewing HSIs to automatic systems
- Assessing exemption requests from operator staffing requirements

### ONGOING RESEARCH

- HFE concepts of operation (CONOPs) of small modular reactor designs
- Impacts of automation on control room design, operator performance, and CONOPs
- Guidance for the assessment of computerized procedures
- Analytic methods to identify HFE-significant I&C degradations
- Integrated system validation

### FUTURE RESEARCH

- Guidance on assessing the impact of automation failures on operator performance
- Methods for measuring workload, situation awareness, and teamwork
- Staffing verification and evaluation for advanced control room designs

### KEY HFE GUIDANCE UPDATES

- NUREG-0711 Rev 3 – 2011
- NUREG-0700 Rev 3 – 2012
- NUREG-0800 Chap 18 – 2012
- NUREG-0711 Primer – 2013
- Electronic Guidance – 2013
- NUREG-0711 Rev 4 – TBD
- NUREG-0700 Rev 4 – TBD
- NUREG-0800 Chap 18 – TBD