

# The Integrated Human Event Analysis System (IDHEAS) Program Overview

Sean E. Peters, Chief  
Human Factors and Reliability Branch  
Office of Nuclear Regulatory Research  
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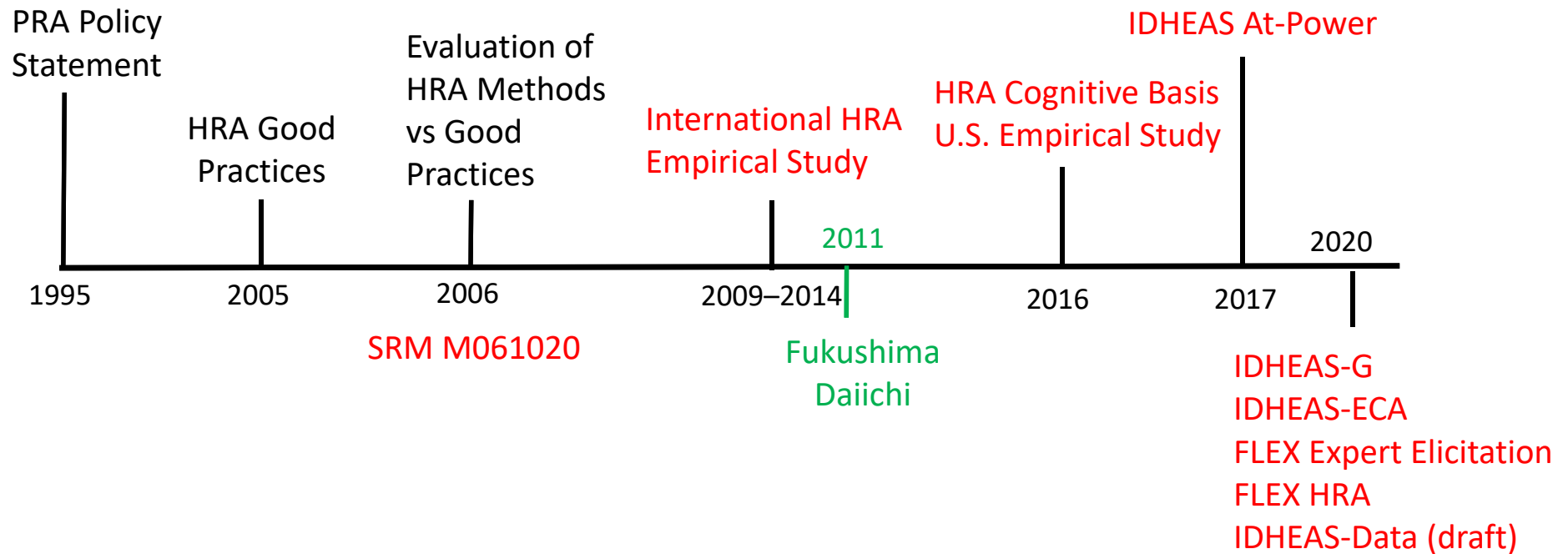
# Why are we here?

## SRM-M061020

The Committee should work with the staff and external stakeholders to evaluate the different Human Reliability models in an effort to **propose either a single model for the agency to use or guidance on which model(s) should to be used in specific circumstances.**

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# Timeline of HRA Development



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# Timeline References

- PRA Policy Statement (60 FR 42622)
- NUREG-1792 - Good Practices for Implementing [HRA] (ML051160213)
- NUREG-1842 - Evaluation of [HRA] Methods Against Good Practices (ML063200058)
- NUREG/IA-0216 - International HRA Empirical Study (ML093380283, ML11250A010, ML14358A254)
- NUREG-2127 - The International HRA Empirical Study: Lessons Learned from Comparing HRA Methods Predictions to HAMMLAB Simulator Data (ML14227A197)
- NUREG-2156 - The U.S. HRA Empirical Study (ML16179A124)

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## Timeline References (Cont.)

- NUREG-2114 - Cognitive Basis for [HRA] (ML16014A045)
- NUREG-2199, Vol. 1 - [IDHEAS] for [NPP] Internal Events At-Power Application (ML17073A041)
- NUREG-2198 – IDHEAS – General Methodology (ML20329A428)
- RIL 2020–02, Integrated Human Event Analysis System for Event and Condition Assessment (IDHEAS-ECA) (ML20016A481)
- RIL 2020-13 – Vols. 1 and 2 – Applying HRA to FLEX Operations - Expert elicitation and Using IDHEAS-ECA – (ML21033A529, ML20345A318, ML21032A119)

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# IDHEAS Development Process

- US and International Benchmarking Projects – determined existing methods’ strengths and weaknesses
- Cognitive Basis Report
  - Extensive Literature Review, Scientific Basis for Structure
- IDHEAS at-Power
  - Industry/NRC Collaboration – goal of reducing variability
- Fukushima Event – March 2011

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# Development Process (cont.)

- IDHEAS-G
  - Guidance for developing application-specific HRA methods or tools
  - Framework to generalize and integrate human error data
  - Structure to analyze human events and identify human failures and root causes
- IDHEAS-ECA
  - Built from IDHEAS-G to handle all NRC applications
  - Can be used for in/ex control room activities and other nuclear/non-nuclear domains (human centered method)
  - Quantification model and software tool included

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# Development Process (cont.)

- IDHEAS-Data
  - Data basis for IDHEAS quantification
  - Constantly evolving and tied to NRC data collection activities
    - Scenario Authoring, Characterization, and Debriefing Application – SACADA
    - NRC’s Human Performance Test Facility
    - Halden Reactor Project



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# IDHEAS Reviews

- IDHEAS–G
  - Multiple ACRS Subcommittee reviews
  - 3 external peer reviews, 2 internal peer reviews
  - Used on: Fukushima, US Benchmarking Events, Fuel Cycle Facility Events
- IDHEAS-ECA
  - Used on FLEX Scenarios (NRC and industry studies), ASP and SDP Events
  - Currently taking user comments to incorporate into revised report/tool
- IDHEAS-DATA
  - Data review (underway)
  - Plans for regular updates

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# Future of the Integrated Human Event Analysis System (IDHEAS) Program

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# IDHEAS Future Work

- IDHEAS-G - Publication
- IDHEAS-ECA – Refinement/Rollout
  - Dependency
  - Integrate with SAPHIRE/SPAR Models
  - Publication of revision
  - Validation vs standards
- IDHEAS-DATA
  - Completion/Publication
  - Revision

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# Other HRA Work

- Minimum joint human error probabilities
- **Data!**
- Wish List
  - Errors of commission
  - Data for Org Factors
  - Security (Physical and Cyber)

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# Path Forward

- Complete/Practical HRA Method
- Improvement to the current state of practice at the NRC
- Human-centered, scientific and data-based
- Program for periodic updates based on user feedback and data
- Can be applied to all NRC applications
- Closure of SRM-M061020

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# Contacts

Human Factors and Reliability Branch, Division of Risk Analysis  
Office of Nuclear Regulatory Research  
US Nuclear Regulatory Commission

IDHEAS program and collaboration	– Sean Peters,	<a href="mailto:Sean.Peters@nrc.gov">Sean.Peters@nrc.gov</a>
Technical questions /feedback on IDHEAS	– Jing Xing,	<a href="mailto:Jing.Xing@nrc.gov">Jing.Xing@nrc.gov</a>
Getting IDHEAS-ECA Software	– James Chang,	<a href="mailto:James.Chang@nrc.gov">James.Chang@nrc.gov</a>
SACADA Program	– James Chang,	<a href="mailto:James.Chang@nrc.gov">James.Chang@nrc.gov</a>

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# QUESTIONS/DISCUSSION