ARCON96 Updates

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ARCON96 Overview

• Purpose:
  – Atmospheric Relative CONcentrations in Building Wakes
  – Calculate relative air concentrations ($\chi/Q$’s) to evaluate control room and technical support center habitability for design basis accidents
  – Near-field dispersion

• Users:
  – Nuclear Regulatory Commission (NRC)
  – Department of Energy (DOE)
    • Savannah River Site, South Carolina
    • Hanford Site, Washington
ARCON96 Development History

- Developed at Pacific Northwest National Laboratory (PNNL) for the NRC Office of Nuclear Regulatory Research (NRR).
  - Fortran Executable Date: “June 25, 1997”
  - User Guide: NUREG/CR-6331
- ARCON96 supersedes an earlier version of the code (ARCON95), and includes modest changes to how the $\chi/Q$ averages are processed.
Issues with ARCON96

- Existing user interface is written in Visual Basic for DOS
  - Only runs on 32-bit operating system (Windows XP/98/95)
  - RAMP distributes the Fortran executable
ARCON96 Development Effort

- Develop a new, 64-bit Windows interface, with standard input/output forms
- Rely on prior input forms for layout and consistency
  - meteorology, source, receptor, default model values, outputs
- Target completion date is calendar year 2017.
ARCON96 Software Quality Assurance

• Desire to have ARCON96 in the DOE Safety Software Quality Assurance - Central Registry
  – Codes that have been evaluated against DOE Safety Software Quality Assurance (SSQA) requirements
    • DOE O 414.1D, Quality Assurance
    • DOE G 414.1-4, Safety Software Guidance
  – Once accepted, known as a “toolbox” code
    • Codes used to establish the safety basis for DOE nuclear facilities
DOE SQA Evaluation Areas

• Project Management and Quality Planning
• Risk Management
• Configuration Management
• Procurement and Supplier Management
• Requirements Identification and Management
• Design and Implementation
• Software Safety
• Verification and Validation
• Problem Reporting and Corrective Action
• Training
DOE Central Registry Codes

- ALOHA (V5.4.4)
- CFAST (V3.1.7 and V5.1.1)
- EPICode (V7.0)
- GENII (V2.10.1)
- HotSpot (V2.07.01)
- IMBA (V4.0.28)
- MACCS2 (V1.13.1)
- MELCOR (V1.8.5)
- ARCON (V2.0)
ARCON Path Forward

• Complete ARCON Windows interface
  – Addendum User’s Guide
• NRC Review
• Submit to DOE for SQA Review
  – Complete review in 2018
Questions?

• Jeremy Rishel
  – Mr. Rishel supports the RAMP Atmospheric Codes, including ARCON96, PAVAN, and XOQDOQ. In addition, Mr. Rishel supports the development of the NRC’s RASCAL emergency response code.
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