Pacific Northwest
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ARCON96 Updates

Fall 2017 RAMP USERS GROUP MEETING – Washington D.C.

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U.S. Nuclear Regulatory Commission Headquarters

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ARCON96 Overview

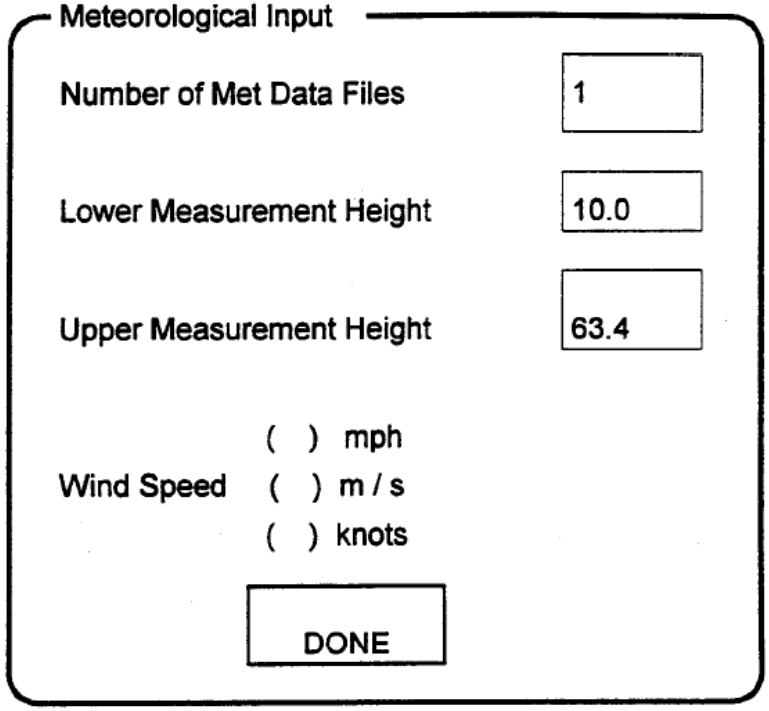
- Purpose:
  - Atmospheric Relative CONcentrations in Building Wakes
  - Calculate relative air concentrations (χ/Q's) to evaluate control room and technical support center habitability for design basis accidents
  - Near-field dispersion
- Users:
  - Nuclear Regulatory Commission (NRC)
  - Department 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 χ/Q averages are processed.

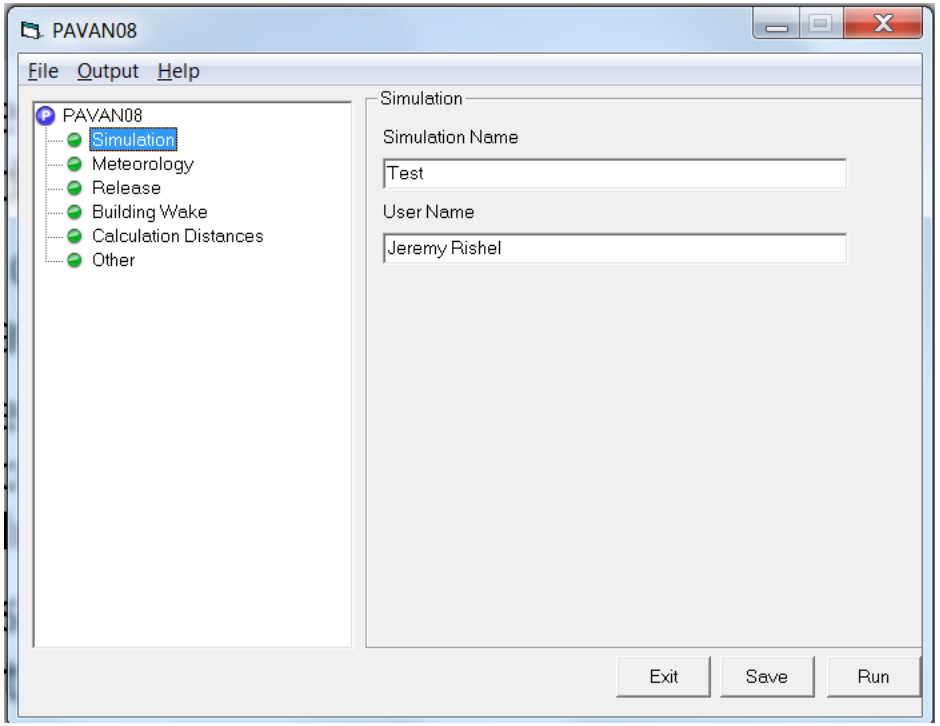
Issues with ARCON96

- 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



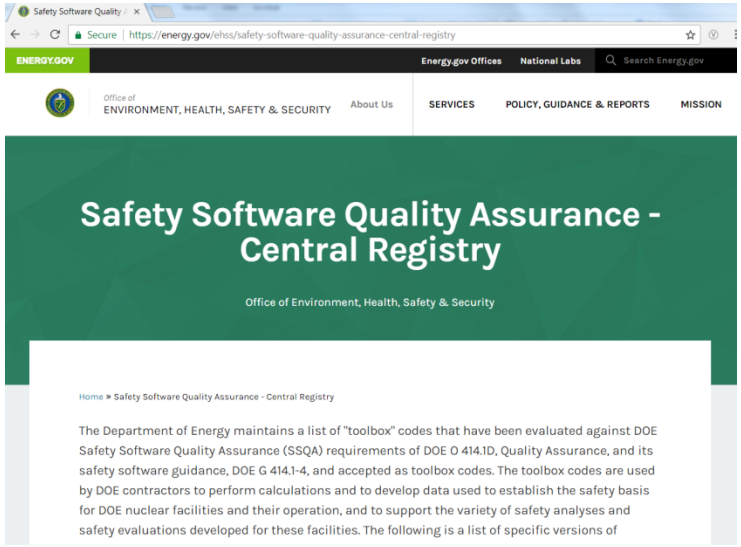
ARCON96 Development Effort

- 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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