

## **ARCON96 Updates**

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

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### **ARCON96** Overview

- Purpose:
  - <u>A</u>tmospheric <u>R</u>elative <u>CON</u>centrations 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

Meteorologica	al Input	
Number of Me	et Data Files	1
Lower Measu	rement Height	10.0
Upper Measurement Height		63.4
Wind Speed	() mph () m / s () knots	
	DONE	





#### **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.

D PAVAN08	
<u>F</u> ile <u>O</u> utput <u>H</u> elp	
PAVAN08  Simulation  Meteorology  Pelease  Building Wake  Calculation Distances  Other	Simulation Name Test User Name Jeremy Rishel
	Exit Save Run





#### **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



#### Safety Software Quality Assurance -**Central Registry**

Office of Environment, Health, Safety & Security

Home » Safety Software Quality Assurance - Central Reg

The Department of Energy maintains a list of "toolbox" codes that have been evaluated against DOE Safety Software Quality Assurance (SSQA) requirements of DOE O 414.1D, Quality Assurance, and its safety software guidance, DOE G 414.1-4, and accepted as toolbox codes. The toolbox codes are used by DOE contractors to perform calculations and to develop data used to establish the safety basis for DOE nuclear facilities and their operation, and to support the variety of safety analyses and safety evaluations developed for these facilities. The following is a list of specific versions of





# **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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