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The SCALE Web Site - Resources for the Worldwide Nuclear Criticality Safety Community

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The SCALE (Standardized Computer Analyses for Licensing Evaluations) computer software system[1] developed at Oak Ridge National Ridge National Laboratory (ORNL) is widely used and accepted around the world for criticality safety analyses. SCALE includes the well-known KENO V.a and KENO-VI three-dimensional (3-D) Monte Carlo criticality computer codes.

For several years, the SCALE staff at ORNL has maintained a Web site to provide information and support to sponsors and users in the worldwide criticality safety community. The SCALE Web Site is located at www.cped.ornl.gov/scale and provides information in the following areas:

- Important Notices to Users
- SCALE Users Electronic Notebook
- Current and past issues of the SCALE Newsletter
- Verification and Validation (V&V) and benchmark reports
- Download updates, utilities, V&V input files

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- SCALE training course information
- SCALE manual online
- Overview of SCALE system
- How to Install and Run SCALE
- SCALE Quality Assurance Documents
- Nuclear Resources on the Internet

Important Notices to Users

The SCALE Web site is used as a communication platform to issue important notices to users in a timely manner. When a new release of the SCALE software package or other software, such as the KENO3D[2] 3-D visualization tool, becomes available, users are notified immediately on the SCALE home page. News of important software fixes or warnings about potential code usage problems may also appear there.

SCALE Users Electronic Notebook (www-rsicc.ornl.gov/enote/enotscal.html)

The SCALE and Radiation Safety Information Computational Center (RSICC) staffs are working together to support a valuable new feature on the Web, the SCALE Users Electronic Notebook. This electronic notebook provides an easy method for users to find answers to common questions or problems regarding the installation and use of SCALE. Many of the responses to users' questions via SCALE help e-mail <scalehelp@ornl.gov> are posted here. The notebook contains a table of contents, and the entries can be searched by keywords. Users can enter questions or comments that the SCALE staff and other users may address. More than 200 entries have been

posted in the notebook. Links to the notebook are provided on the SCALE home page and in the PC installation of SCALE 4.4a.

SCALE Newsletter (www.cped.ornl.gov/scale/scale_news.html)

The SCALE Newsletter has been published twice yearly in January and July for the past ten years. Prior to the establishment of the SCALE Web site approximately four years ago, the newsletter was the only widespread form of communication with users. All issues of the SCALE Newsletter from January 1993 to January 1999 are available in HTML format on the Web. Beginning with the July 1999 issue, the newsletter is published on the Web in Adobe Acrobat PDF format complete with bookmarks to each article in the issue. This format allows us to electronically publish copies identical to the hard copies. As a result, distribution of hard copies of the SCALE Newsletter is being terminated after the January 2000 issue. Users may subscribe to an e-mail list that notifies them when a new issue has been published on the Web.

SCALE Validation Reports (www.cped.ornl.gov/scale/benchmark.html)

Numerous benchmark and validation reports using SCALE have been published over the past 20 years. Included on the SCALE Validation Web page are complete copies in PDF format of the following criticality safety validation reports.

Guide to Verification and Validation of the SCALE-4 Criticality Safety Software NUREG/CR-6483 (ORNL/TM-12834)

Criticality Benchmark Guide for Light-Water-Reactor Fuel in Transportation and Storage Packages, NUREG/CR-6361 (ORNL/TM-13211)

Validation of the SCALE Broad Structure 44-Group ENDF/B-V Cross-Section Library for Use in Criticality Analyses, NUREG/CR-6102, ORNL/TM-12460

SCALE Download Directory (www.cped.ornl.gov/scale/download.html)

The SCALE download directory provides users with code patches and updates that can be downloaded and installed on their computers. It also includes utility programs not distributed with SCALE such as the USLSTATS[3] program to statistically determine Upper Subcritical Limits for a set of criticality validation results.

SCALE Training Course Information (www.cped.ornl.gov/scale/trcourse.html)

The SCALE staff has offered training courses since 1993. Several courses are offered annually. Up-to-date information, schedules, and registration forms are provided on the SCALE Training Web page.

SCALE Manual (www.cped.ornl.gov/scale/man.html)

The latest version of the SCALE Manual (3 Volumes, approximately 4,500 pages) is available electronically in PDF format for viewing with Adobe Acrobat Reader with Search. To view any section of the manual online, users can click on the Table of Contents link and then click on the

section they want to view. The search capability is only functional if the user downloads the PDF files to their computer. The entire electronic manual is included on the SCALE CD from RSICC. For users with a reliable ethernet connection, they can download the complete manual as a self-extracting ZIP file, a Unix tar file, or a Macintosh compressed file. For users with a modem, it is possible to download individual sections of the manual.

Overview of SCALE system (www.cped.ornl.gov/scale/overview.html)

The SCALE Web site includes an overview of the SCALE code system for those who are not familiar with SCALE. The overview covers historical background of SCALE, descriptions of the modules and data libraries in SCALE, and information on obtaining SCALE.

How to Install and Run SCALE (www.cped.ornl.gov/scale/how.html)

This Web page includes information relating to the installation and execution of SCALE such as:

- Installation Instructions for SCALE 4.4 on a Windows 95/98/NT PC
- How to Run SCALE on a UNIX Workstation
- SCALE Files and Directories
- How to Make and Install Part of the Workstation Version of SCALE

SCALE Quality Assurance Documents (www.cped.ornl.gov/scale/scalehelp.html)

This section of the Web site contains copies of the plans and procedures related to the quality assurance of SCALE:

- SCALE Quality Assurance Plan
- SCALE Configuration Management Plan
- SCALE Verification and Validation Plan

Nuclear Resources on the Internet (www.cped.ornl.gov/scale/nucindex.html)

A large number of useful links to other Web sites related to nuclear energy have been collected on this page to help the nuclear community.

Conclusions

Users are encouraged to visit the SCALE Web site often for current information and updates on SCALE. The presentation of this paper will feature a live interactive demonstration of the SCALE Web site.

References

1. SCALE: A Modular Code System for Performing Standardized Computer Analyses for Licensing Evaluation, NUREG/CR-0200, Rev. 6 (ORNL/NUREG/CSD-2R6), Vols. I, II, and III. Available from Radiation Safety Information Computational Center at Oak Ridge National Laboratory as CCC-545.

2. J. E. Horwedel and S. M. Bowman, "KENO3D Visualization Tool for KENO V.a Geometry Models,"ANS 1999 Annual Meeting, June 6–10, 1999, Boston, MA, *Trans. Am. Nucl. Soc.* **80**, 158–159 (June 1999).
3. S. M. Bowman, M. D. DeHart, C. V. Parks, "ULSTATS: Computerized Statistical Methods for Determination of Bias and Subcritical Limits," ANS 1997 Annual Meeting, June 1–5, 1997, Orlando, FL, *Trans. Am. Nucl. Soc.* **76**, 238–241 (June 1997).