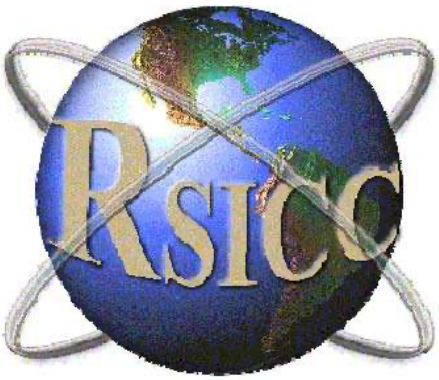
Radiation Safety Information Computational Center



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No. 721 August 2025

"The meaning of life is that it stops."

– Franz Kafka

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CHANGES TO THE RSICC CODE AND DATA COLLECTION

There were two updates to the RSICC catalog for those individuals that may be interested.

CCC-878/ARCON2

ARCON2, contributed by Pacific Northwest National Laboratory, Richland, Washington, through the US Nuclear Regulatory Commission, Rockville Maryland, USA, was developed for the U.S. Nuclear Regulatory Commission (NRC) to calculate relative atmospheric concentrations (X/Q values) in the vicinity of buildings to assist staff in their review of licensee submittals related to control room and technical support center habitability. Regulatory Guide 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants", provides guidance on the use of ARCON 2.0 for determining atmospheric relative concentrations to be used in design basis evaluations of control room radiological habitability.

The ARCON 2.0 interface was developed through the NRC Radiation Protection Computer Code Analysis and Maintenance Program (RAMP). RAMP develops, maintains, improves, distributes and provides training on NRC-sponsored radiation protection and dose assessment computer codes.

ARCON2 output provides the cumulative distribution function (CDF) for X/Q limits that are exceeded for averaging periods from 1 to 8 hours (short-term averaging periods) and for 12 through 720 hours (long-term averaging periods). These two codes have been erroneously printing the same X/Q limits for both short-term and long-term averaging periods. This error was apparent in the ARCON2 User's Guide Example 5. In the revised version, ARCON2 code was modified to print the correct X/Q ranges for long-term averaging periods.

ARCON2 calculates the lower limits (see LOWLIM values in the .EXT file) for the CDF distribution from the maximum centerline X/Q for short-term averaging periods and from a combination of maximum centerline and sector-averaged X/Q values for long-term averaging periods. Though the correct values were used for CDF generation, the lower limit values for the 4-hour averaging interval were incorrectly displayed instead of the limit from 12 hours or any other long-term averaging period in both the CDF and EXT output files. In the revised version of ARCON2, the X/Q limits printed in the output was correctly set for the value associated with the 12-hour averaging period in the CDF and EXT filesARCON2 uses Using joint frequency distributions of wind direction and wind speed by atmospheric stability, the program provides relative air concentration (X/Q) values as functions of direction for various time periods at the exclusion area boundary (EAB) and the outer boundary of the

low population zone (LPZ). Calculations of X/Q values can be made for assumed ground-level releases or elevated releases from free-standing stacks. The X/Q calculations are based on the theory that material released to the atmosphere will be normally distributed (Gaussian) about the plume centerline. A straight-line trajectory is assumed between the point of release and all distances for which X/Q values are calculated.

The package is transmitted digitally as a zip file that includes Windows executables, documentation, and sample problems. Windows OS is supported (RSICC ID: C00878PCX8600).

CCC-879/PAVAN2

PAVAN2, contributed by Pacific Northwest National Laboratory, Richland, Washington, through the US Nuclear Regulatory Commission, Rockville Maryland, USA, estimates down-wind ground-level air concentrations for potential accidental releases of radioactive material from nuclear facilities. Options can account for variation in the location of release points, additional plume dispersion due to building wakes, plume meander under low wind speed conditions, and adjustments to consider non-straight trajectories. PAVAN2 computes an effective plume height using the physical release height which can be reduced by input terrain features.

PAVAN2 uses joint frequency distributions of wind direction and wind speed by atmospheric stability, the program provides relative air concentration (X/Q) values as functions of direction for various time periods at the exclusion area boundary (EAB) and the outer boundary of the low population zone (LPZ). Calculations of X/Q values can be made for assumed ground-level releases or elevated releases from free-standing stacks. The X/Q calculations are based on the theory that material released to the atmosphere will be normally distributed (Gaussian) about the plume centerline. A straight-line trajectory is assumed between the point of release and all distances for which X/Q values are calculated.

The package is transmitted digitally as a zip file that includes Windows executables, documentation, and sample problems. Windows OS is supported (RSICC ID: C00879PCX8600).

SINGLE USER MULTI-ORGANIZATION LICENSE AGREEMENT

(*Last updated July 1, 2018*)

To support the use of RSICC software by multi-national organizations and international collaborations, RSICC now offers our customers the option to request a Single User Multi-Organization Software License Agreement. The Single User Multi-Organization Software License Agreement addresses issues regarding the "re-export" of software and data packages obtained from RSICC because under Federal export control regulations our customers cannot "re-export" the code to another person in another country.

This agreement is intended to allow our customers to specify additional foreign locations for which they may be approved to utilize RSICC software. In general, the default option will be the standard single user license agreement for the country in which the customer resides and is employed. The following defines the requirements for use of this license agreement.

This SUMO software license agreement is only available for individuals that receive software directly from RSICC. In addition, the point of contact (host or system administrator) at the additional foreign location(s), must be licensed directly from RSICC and must agree to abide by the policies associated with host/server/cluster systems that are summarized following this announcement.

To apply for this license the customer must first register with RSICC and provide full and complete information. When submitting their request, the customer must provide the following information in the COMMENTS section of the request form for each applicable package:

- full name and email address of the point of contact (POC),
- the full name of the organization at which the software will be used, and
- the complete address (no post office boxes) of the organization under which additional access is being requested.

Individuals that would like to utilize this service must have a valid reason for needing this access and provide such justification to RSICC in the END USE statement as well. If this information is not included in the END USE statement, then the customer's request will only be considered for the standard single user license agreement.

When processing the request, RSICC staff will verify that the designated POC(s) has a valid license for the same version of software that is being requested by the applicant and verify that the POC obtained the package directly from RSICC. If the POC, did not obtain the package directly from RSICC, the POC will need to register with RSICC, apply and be approved for the package before the applicant's request can be processed.

The requests will be reviewed for each designated location and a decision will be rendered as to whether a license is granted. If an organization or location is denied, then the customer will be notified and may be limited to the standard single user license agreement for their own organization.

Exceptions:

Persons that have any citizenship of or are in countries that are not listed in Appendix A of 10 CFR 810 are not permitted to utilize the Single User Multi-Organization License Agreement.

Fees:
The customer making the request for the single user multi-organization software license will be required to pay the cost recovery fee for each location at which they are approved. In addition, the POCs at the other foreign locations that have not obtained the software directly from RSICC will have to obtain the software from RSICC and pay the applicable fee.

HOST/SERVER/CLUSTER GUIDANCE

(*Last updated November 1, 2022*)

Software obtained from RSICC is export controlled under the jurisdiction of the U.S. Department of Energy, 10 CFR 810, or the U.S. Department of Commerce, 15 CFR 730-744. Additionally, RSICC distributes this software under guidance issued by the U.S. Department of Energy's Office of Nonproliferation and Arms Control. The distribution and use of RSICC software is restricted and controlled under these regulations and guidelines. Individuals that request the software must be cleared through both an export control and a nonproliferation review process prior to the individual being granted a license to receive software for a specific end use.

The software distributed by RSICC is licensed to individual requestors (Licensee) under a single-user license agreement while employed at the organization listed on the license forms and cannot be transferred to any other individual or entity. The Licensee is responsible for the control, management and protection of the software. The Licensee is responsible for compliance with U.S. export control requirements (laws and regulations) and the terms of the license agreement. This includes preventing access to the software by any individual or entity (including IT staff) as such access may be deemed an export control violation. Individual Licensees should protect the software, documentation, and installation accordingly. Neither the software nor manuals should be posted to the Internet or otherwise be made publicly available. Any and all system administrators that are assisting with the installation and maintenance of a licensed code(s) or that would otherwise have access to a licensed code(s) that is placed on a stand-alone system and/or server/cluster must also be licensed for the exact version of the software that is placed on these systems. Individuals whose duties are only that of a System Administrator are not authorized to be users of the licensed codes(s). **Those individuals serving only as system administrators are NOT charged the cost recovery fee for processing their requests.**

System administrators and/or hosts should implement standard and customary account access and/or file permissions such that only the licensed individuals may access the program. This should include identity and access management, such as multi-factor authentication, to ensure software is kept secure from unauthorized access. Please note that the single-user license agreement is code and version specific. The Licensee must be licensed for the specific version to which they are granted access. For example, an individual with a license only for MCNP5 should not be permitted access to MCNP6.1. Additionally, some individuals are only licensed for the executable versions of the code(s), and the system administrator(s) must ensure that such individuals do not have access to the source code. Therefore, it is recommended that the source code be removed after installation of the program(s) and furthermore procedures must be implemented such that control software is not lost via decommissioned storage media.

Network, server, parallel, cluster, or similar installations outside of the United States may not be within a country NOT listed in Appendix A of 10 CFR 810 nor occur at facility identified as an entity under 15 CFR 744.

RSICC software may be hosted on a server, cluster or high-performance computing system with the following conditions:

1) Each server/cluster operator must designate one individual responsible for oversight of the use of RSICC software on the server/cluster. This individual will be responsible for communicating and reporting to RSICC on an annual basis regarding the users of the cluster/server.

2) Each and every system administrator that would have access to any form (source or executable) must register, request, **and** be approved for the software with RSICC for the version to which they would have access.

3) An authorized and approved system administrator may install and maintain the software and must ensure that the software is not distributed or shared with those who do not have a specific license for the version to which they would have access. System administrators are required to utilize protocols that limit access to the software. Users should only be granted access and use of software to which they have a specific license, e.g. users that have a license for SCALE 6.1 should NOT be granted access to SCALE 6.0 or SCALE 6.2.

4) System administrators are not permitted to provide access to RSICC software to individuals **NOT** located within the same country as the server/cluster unless the Licensee has an approved Single User Multi-Organization License Agreement from RSICC.

5) Individuals with citizenship or multiple citizenships that include a country not listed in Appendix A of 10 CFR 810 **may be granted** access to RSICC software on a server/cluster, if the

individual **has been approved** for access to the software by the U. S. Department of Energy's Office of Nonproliferation and Arms Control.

6) Under no circumstances should an individual with citizenship or multiple citizenships that include a country **NOT** listed in Appendix A of 10 CFR 810 be granted access to RSICC software on the server/cluster, if that individual has **NOT** been approved by the U.S. Department of Energy's Office of Nonproliferation and Arms Control. Additionally, under no circumstances should an individual located at an entity identified under 15 CFR 744 be granted access to RSICC software on the server/cluster.

7) Individuals that have been only granted access to RSICC's secure cloud server **MAY NOT** be granted access to any other server/cluster.

8) When a Licensee requests access to RSICC software on a server/cluster, the system administrator must follow the following process:

(a) The system administrator will require that the Licensee provide proof of a license by requiring that the Licensee provided an electronic copy of either the Single User License Agreement or the Single User Multi-Organization License Agreement. System administrators cannot provide access to anyone located in another country unless that individual has an approved Single User Multi-Organization License Agreement from RSICC and the organization of the system administrator is listed on the SUMO License Agreement.

(b) The system administrator must ensure that the Licensee's current installation/affiliation is the same as that on the license agreements.

(c) If the Licensee's current installation is NOT the same as that on license agreements, then access should be denied until the Licensee has updated license agreements with RSICC. This will require the Licensee to update their registration with RSICC and submit a new request with RSICC. The Licensee should not be granted access to the software until they have been authorized. Please note that some approvals are location and organization specific.

9) The system administrator will maintain records of the Licensees that are utilizing the server/cluster and send a record to RSICC (rsic@ornl.gov) that include the Licensee's full name, RSICC customer identification number, installation, and the codes to which the Licensee has access on the system. This information must be provided when the system administrator makes the first request to RSICC to provide such services and must be updated annually by sending updated information to RSICC no later than November 30 of each calendar year. The record should include the customer's full name, RSICC customer number, customer installation as well as request numbers and software package name and identifier for which they are accessing on the cluster.

Server/cluster operators that agree to comply with these conditions may install RSICC software on the server/cluster that are within their corporate/institutional ownership, physical control, and the individual country identified.

USE OF RSICC SOFTWARE ON COMMERCIAL CLOUD SERVICES

(***Last updated September 1, 2024***)

Many customers have asked about the use of RSICC-distributed software such as MCNP® and SCALE on a commercial cloud system. If you intend to use a commercial cloud solution for RSICC software, please ensure that the chosen solution meets with the following:

RSICC may only support cloud solutions where the cloud service is physically within the jurisdiction of the United States of America, and provides information security objectives /impact levels meeting guidelines consistent with Level 4 from current DoD Cloud Computing Security Requirements (https://public.cyber.mil/dccs/dccs-documents/). Cloud services that meet this requirement have U.S persons as system administrators.

The AWS GovCLOUD (US) (https://aws.amazon.com/govcloud-us/) and the Microsoft Azure Government (https://azure.microsoft.com/en-us/explore/global-infrastructure/government) cloud services are options that meet the DOD IL4 requirements. Various RSICC customers in the U.S. have used the AWS GovCloud (US) and Microsoft Azure Government (US) services. There are other commercial cloud services that also meet the Level 4 DOD Cloud Computing Security Requirements. Hoonify (https://www.hoonify.com/) is the only private server operator in the U.S. that provides access to the MCNP® Monte Carlo code. Staff at Hoonify comply with RSICC's server/cluster requirements and ensure that all users of their server have a valid RSICC license. Some RSICC customers have availed themselves of Hoonify's services. It is important to remember that only persons licensed in the U.S. can access these systems for use of RSICC software.

The following are guidelines for controlling access to the software on such commercial cloud servers. The employee that is responsible for working with the cloud service to install the software must be licensed. If this person is not an end user but a systems administrator/manger we will waive any fee for the software that they might need. After installation, the source code for the package should be removed since some of the users may only be licensed for the executable version of the software. The individual that manages an employee's access to the cloud service should ensure that everyone that is given access is licensed. We request that you keep a record of the persons given access to the cloud service with verification of each person's license. The primary point of contact for the organization that authorizes access for company employees to the cloud service should provide RSICC with an annual report each November of the users of the cloud service.

END USE STATEMENT

(***Last updated January 1, 2025***)

Customers are strongly encouraged to provide full and complete information regarding the intended end use of the software being requested. End use statements that specify that the code is for research, training or educational activities are not sufficient. RSICC's regulators need to know explicitly for what purpose you intend to use the codes and detail needs to be provided. Requests that lack sufficient detail will be rejected. Please include the type of calculations that you intend to perform e.g., criticality, reactor physics, shielding, dose, etc. and for what types of applications e.g., reactor shielding design, fusion shield design, nuclear medicine, reactor design, etc. For reactor simulation uses, the customer should include a description of the reactor type and the intended use of the reactor such as commercial, maritime, or space reactors. Use of software distributed by RSICC may be restricted under U.S. Federal export control regulations for maritime or space applications.

Students that submit requests to RSICC are strongly encouraged to consult their professor or academic advisor as to what purpose they intend to use the codes for their classes and/or their research. Professors are also encouraged to provide such guidance to their students since the professor is responsible for identifying the activities of the students under their tutelage. Professors are encouraged to write an end use statement for their students that describe both the intended use of the code and the applications for which the code will be applied. Providing this information will help expedite the processing of the request and speed up delivery of the software.

REGISTRATION REQUIREMENTS

(***Last updated September 13, 2023***)

During the registration process, individuals are required to provide the name of the institution at which they will use the software, an institutional mailing address and an institutional e-mail address. RSICC's regulators require us to obtain an address associated with the individual's organization. If you are working remotely, you may include an alternate mailing address as a comment during the registration process. Please note that you cannot provide an alternate mailing address that is in a country different than that for the organization with which you are affiliated. RSICC cannot register a customer for access to software in a country different than that of the organization with which the individual is affiliated as the single user license and export control agreements are specific to the country in which the organization is located.

REQUESTING PRIOR VERSIONS OF SOFTWARE

(***Last updated January 1, 2025***)

RSICC retains older versions of software that we distribute in our archives; however, our software list contains the most recently released version of the software. Customers can request older versions of the software by including a comment when submitting their request stating the versions of the software that are needed. Customers will be charged a cost recovery fee for each version of a package that is requested.

CONFERENCES, TRAINING COURSES, SYMPOSIA

CONFERENCES

34th International Conference Nuclear Energy for New Europe

The Nuclear Society of Slovenia in association with the Jožef Stefan Institute, cordially invites you to attend the 34th International Conference Nuclear Energy for New Europe. The conference will be held in Bled, Slovenia, **September 8 - 11, 2025**.

The conference is an annual meeting of professionals dealing with different aspects of nuclear energy from all around Europe and worldwide. The primary objective of the meeting is to foster international cooperation amongst professionals active in nuclear research and educational institutions, nuclear vendors, utilities, and regulatory bodies.

For more details on this conference, please visit website at https://www.djs.si/nene2025/.

15th International Conference on of the Croatian Nuclear Society

The Fifteenth International Conference on Radiation Shielding (ICRS15) will be held May 31 – June 3, 2026 at the Hotel Kolovare, Zadar, Croatia. The conference is organized by the Croatian Nuclear Society. Those interested can find additional details at: http://www.nuclear-option.org

15th International Conference on Radiation Shielding

The Fifteenth International Conference on Radiation Shielding (ICRS15) will be held December 25 – 29, 2026 at the Lotte Hotel Jeju, Jeju, South Korea. The conference is organized by the Korean Association for Radiation Protection. Those interested can find additional details at: http://icrs15.org/

TRAINING COURSES

MCNP®

MONTE CARLO N-PARTICLE

LANL MCNP6 Class Schedule

Individuals interested in attending or that have registered for these classes are encouraged to contact the organizers regarding any delays or cancellations.

Website: https://mcnp.lanl.gov/classes.html

September 8 – 12, 2025	Using NJOY to Create MCNP® ACE Files and Visualize Nuclear Data Non-US citizens must register by June 20, 2025	$1,800
October 6 – 10, 2025	Intermediate MCNP6 Non-US citizens must register by July 18, 2025	$1,800
October 27 – 31, 2025	Introduction to MCNP6 Non-US citizens must register by August 8, 2025	$600
December 1 – 5, 2025	Variance Reduction with MCNP6 Non-US citizens must register by September 12, 2025	$1,800

See the website for more information.

SCALE Training Courses at ORNL

SCALE is a modeling and simulation suite for nuclear safety analysis and design that provides a comprehensive, verified and validated, user-friendly tool set for criticality safety, radiation shielding, reactor physics, spent fuel characterization, and sensitivity and uncertainty analysis (https://www.ornl.gov/scale).

The SCALE training courses are taught by developers and expert users from the SCALE Team. These courses provide a review of theory, description of capabilities and limitations of the software, and hands-on experience running problems of varying levels of complexity.

All attendees for the SCALE training courses must be licensed users of SCALE 6.3. Licenses can be requested from RSICC in US and RIST/NUCIS in Japan. If you plan to attend, you are recommended to request a software license at least two months prior to the start of the training course.

Registration is now open for the next block of SCALE training courses, offered in-person at Oak Ridge National Laboratory, October 6–24, 2025.

You can register from the SCALE website at https://www.ornl.gov/content/training-person-ornl or via this direct link https://utconferences.eventsair.com/scale-fall-2025/register/Site/Register.

The currently scheduled training courses are listed below.

Course Name and Date	Location	Registration fee
October 6–10, 2025 (Mon-Thurs: 8am-5pm and Fri: 8am-12pm EDT) - SCALE/ORIGEN Standalone Fuel Depletion, Activation, and Source Term Analysis. An example of the agenda can be viewed **here**.	ORNL Oak Ridge, TN, USA	$2,500*
October 13–17, 2025 (Mon-Thurs: 8am-5pm and Fri: 8am-12pm EDT) - SCALE/TRITON Lattice Physics and Depletion. An example of the agenda can be viewed **here**.	ORNL Oak Ridge, TN, USA	$2,500*
October 20–24, 2025 (Mon-Thurs: 8am-5pm and Fri: 8am-12pm EDT) - SCALE Criticality Safety and Radiation Shielding. An example of the agenda can be viewed **here**.	ORNL Oak Ridge, TN, USA	$2,500*

**Full-time university students can register at a reduced rate of $1,200. For each course over one, professional registration fees are discounted $250, and student registration fees are discounted $120. Payment must be received at least one week prior to attending the training course.*

For more information regarding these courses, visit the SCALE website at https://www.ornl.gov/scale/learning or send an email to scalehelp@ornl.gov.

Please email scalehelp@ornl.gov for any related question or suggestion.

SYMPOSIA

2025 CALENDAR

August 2025

21st International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETS-21), August 31 – September 5, 2025, Busan, Republic of Korea, Website: https://www.nureth-21.org/

September 2025

Nuclear Energy Conference and Expo (NECX), September 8 – 11, 2025, Atlanta, Georgia, USA. Website: TBA

Nuclear Energy for New Europe 2025 Conference, September 8 – 11, 2025, Bled, Slovenia. Website: https://www.djs.si/nene2025/conference

Nuclear Criticality Safety Division 2025 Conference, September 14 – 18, 2025, Austin, Texas, USA. Website: https://www.ans.org/meetings/ncsd2025/

October 2025

TopFuel 2025: Nuclear Reactor Fuel Performance Conference, October 5 -9, 2025, Nashville, Tennessee, USA. Website: https://www.ans.org/meetings/topfuel2025/

November 2025

2025 IEEE Nuclear Science Symposium Medical Imaging Conference and Room Temperature Semiconductor Detectors Symposium, November 1 – 8, 2025, Yokohama, Japan. Website: https://nssmic.ieee.org/2025/

2025 ANS Winter Conference and Expo, November 9 – 12, 2025, Washington, D.C., USA. Website: https://www.ans.org/meetings/view-wm2025/

16th International Symposium on Fusion Nuclear Technology, November 9 – 14, 2025, Knoxville, Tennessee, USA. Website: https://isfnt-16.ornl.gov/

2026 CALENDAR

April 2026

PHYSOR 2026: International Conference on the Physics of Reactors, April 19 – 23, 2026, Turin, Italy. Website: https://www.physor2026.org/

Nuclear and Emerging Technologies for Space (NETS-2026), April 27 – 30, 2026, Dayton, Ohio, USA. Website: https://www.ans.org/meetings/view-nets2026/

May 2026

15th International Conference of the Croatian Nuclear Society, May 31 – June 3, 2026, Zadar, Croatia. Website: https://nuclear-option.org/

2026 Annual Conference of the American Nuclear Society, May 31 – June 3, 2026, Denver, Colorado, USA. Website: https://www.ans.org/meetings/view-398/