framatome

LADON

Productivity enhancement suite

Intuitive, graphical and modern tools for core design and safety analysis

Challenge

Nuclear power is transitioning to a new generation of engineers when the pressure to save resources is the strongest. Framatome has modernized its codes for core design and safety limits verification to reduce costs and better train new engineers. Key elements of this challenge include:
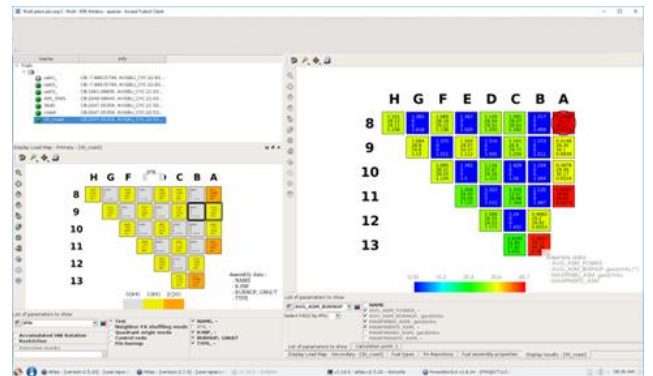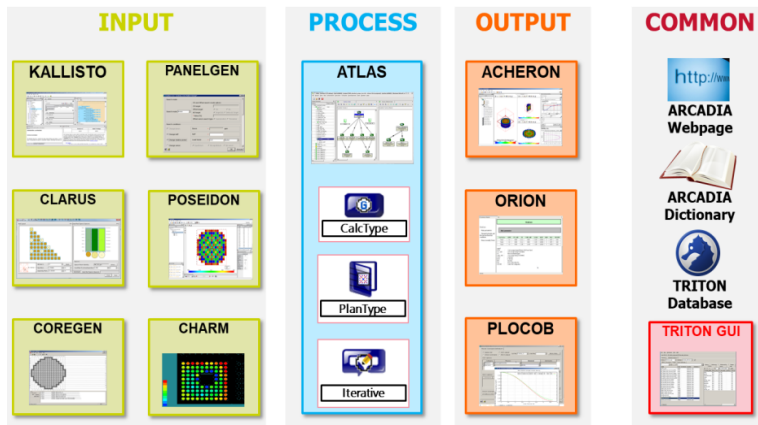
- Knowledge transfer from retiring experts to today's generation of engineers that require modern, graphical tools
- Continuous improvement of quality
- Data exchanges between disciplines
- Automated reporting and QA tools

Solution

LADON is Framatome's solution to this challenge.

The LADON suite uses automation with an intuitive graphical interface that is easily customizable to a wide array of codes and processes.

Our extensive base of experts developed the tools to extend from solver input preparation to analytical process automation, post-processing, quality assurance, and document generation.

© Framatome 2020. Simple core design with Poseidon GUI

Customer benefits

- GUI-based to improve user interface and reduce training time
- Customizable automation tools improve efficiency and allow the analyst to focus on the physics
- Flexible building blocks allow any process to be quickly and easily realized
- Standard database format increases usability and quality
- Python powers the automation so it is easy to understand and adapt by your engineers
- Compute on a cluster to expand solution space and improve solution times
- Work with ARCADIA – 3D, coupled physics simulation
- LADON is adaptable to your legacy simulation tools

Expanding Rollout

- France, Germany, USA, Switzerland and Netherlands
- Standard Automation Platform:
  - PWR Core Design
  - XS Library Generation
  - Safety Analysis
- Special Automation Platform:
  - Ejected Rod Analysis with AREA Methodology
- Supported Licensing Methodologies
  - ARCADIA, PRISM

Your performance is **our** everyday **commitment**

Technical information

1. ATLAS is the central component of the LADON suite. It is the hub for process automation allowing users to generate reusable calculations and plans to automate analyses, review data, and QA results. Within ATLAS, the user can:
- Create instances of calculations
- Link series of calculations
- Duplicate calculations already performed
- Share ATLAS project(s) with other engineers
- Perform QA checks and QA reporting

2. The LADON suite includes an array of GUI-based input modification tools geared towards common codes and processes and to appeal to various analysts.
PANELGEN fully automates input deck generation
KALLISTO allows users to adjust input either in text or graphical formats
POSEIDEN GUI facilitates core design development
COREGEN GUI automates core geometry and mesh development
CLARUS AND CHARM GUIs assist in cross section development and analysis

3. LADON's output tools streamline and improve post processing.
ACHERON allows users to view solver results in a well-adapted and flexible format from 0D parametric curves to 3D core views.
PLOCOB provides quick graphical displays of thermal-hydraulic results.
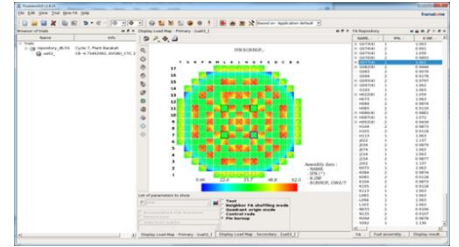ORION allows users to quickly develop summary calculation reports.

4. ARCADIA Dictionary
- User friendly definitions of solver inputs and outputs provide clear unambiguous explanations of keywords for quality and clarity.
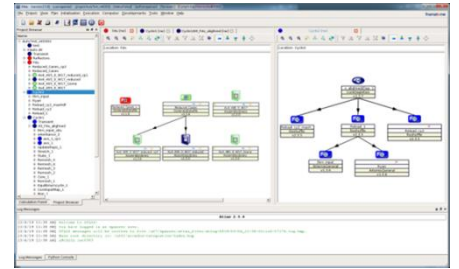- Plug-in integrates with input and output processing GUIs

5. TRITON Database
- Store geometry input data, key output results and measured data
- Facilitate input definition by downloading database information
- Verify data once and safely use many times
- Share the data with the ARCADIA user community
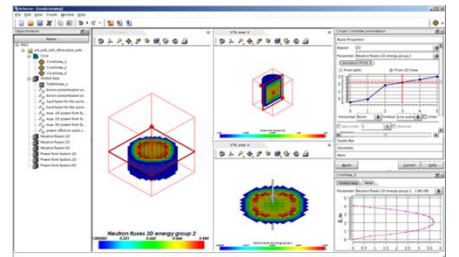- Provide statistics on wide range of data
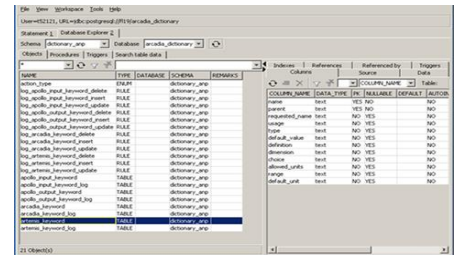
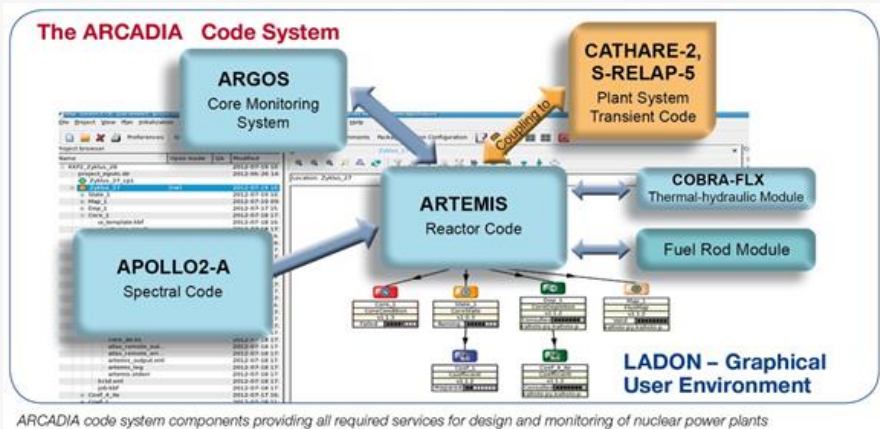**GUIs Generate Solver Inputs**

Process and Automation Tools

GUIs to Review Solver Outputs

User/Process Support tools

LADON is a part of the ARCADIA Code System

ARCADIA code system components providing all required services for design and monitoring of nuclear power plants

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