

CaskWorks® Software

Background

Westinghouse has developed CaskWorks® software, a nuclear fuel data management product that helps pressurized water reactor and boiling water reactor plants qualify fuel-loading patterns for dry storage.

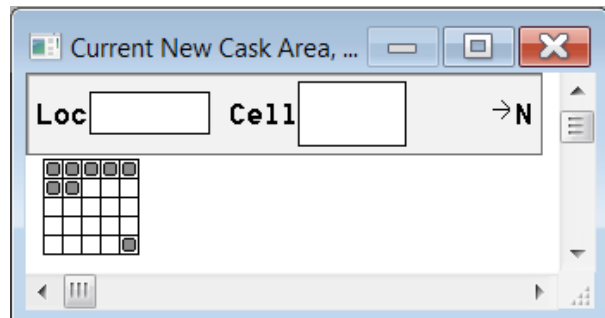
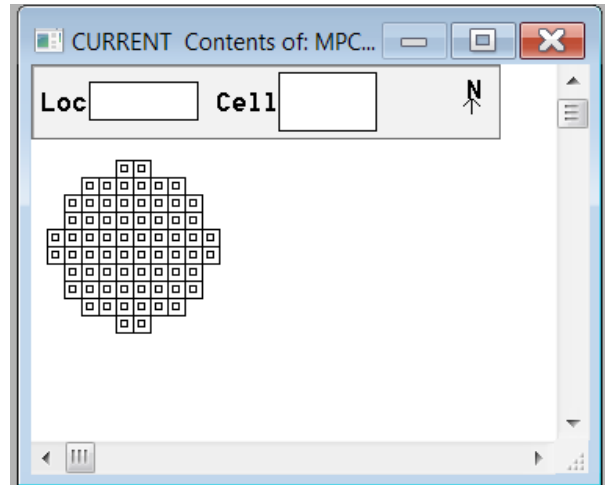
By integrating cask-loading tasks with site-specific special nuclear material (SNM) data, fuel-movement planning tools, and industry standard analysis modules, CaskWorks software provides an excellent tool for fuel and reactor engineers responsible for qualifying fuel for dry cast loading. This system reduces dry fuel storage operational costs by efficiently selecting and arranging fuel assemblies and components for dry cask loading, while providing compliance with cask certification and site business rules.

Description

CaskWorks software automates assembly qualification and selection for cask loading and allows the user to interactively select assembly alternatives. The software also automates the generation of cask-loading patterns, validating them based on plant-specific constraints, such as decay heat, as-low-as-reasonably-achievable and plant specifications. CaskWorks software provides electronic files for planning, reporting and documentation, and supports multiple planning strategies. Cask certification rules are modeled in the user data.

Meeting Industry Needs

The U.S. Nuclear Regulatory Commission provided explicit approval to a utility to use Westinghouse's CaskWorks ORIGEN-ARP methodology to calculate decay heat for their dry storage cask and spent fuel pool applications.



CaskWorks software screens shots of a loaded cask and cask receipt area

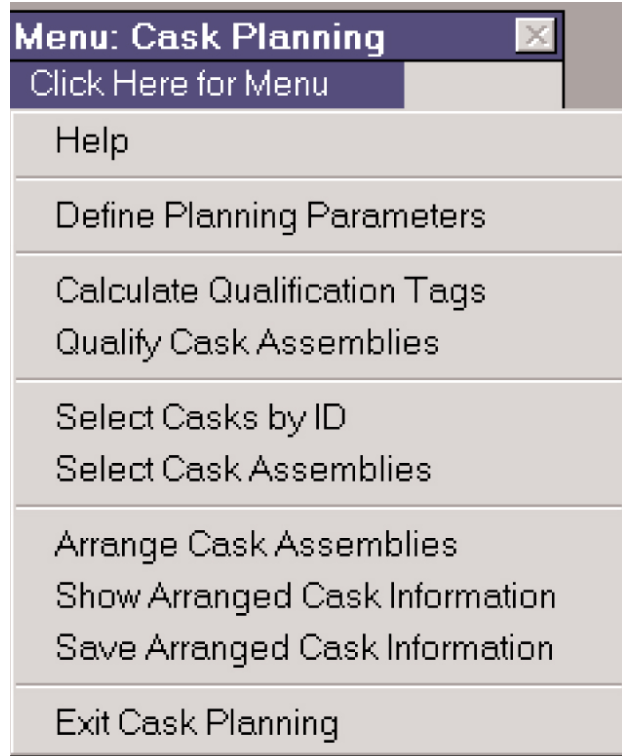
Westinghouse used feedback from 30 surveyed power plants as the base for the CaskWorks software design objectives. Westinghouse found that its customers needed a data management package that would help minimize the costs and risks associated with their dry cask-loading activities, as well as help them plan for future fuel-loading projects.

To address these concerns, Westinghouse designed CaskWorks software to:

- Minimize dose over the life of a dry storage facility
- Minimize external dose and peak clad temperature for casks
- Minimize the number of specialized casks needed, thereby minimizing the costs
- Maintain enough qualified fuel to continue loading throughout the future
- Facilitate space optimization in the spent fuel pool racks
- Provide a tool for long-term pool capacity management (PoolWorks™ software)

Interface Features

- CaskWorks, ShuffleWorks® and PoolWorks™ software products share the same plant model and use similar window interfaces and outputs. Users trained in one product can easily use the others.
- CaskWorks software produces information for automatic cask load planning in ShuffleWorks.
- CaskWorks software and PoolWorks software share the same decay heat package (ORIGEN-ARP) and plant-specific templates.
- Assembly historical, design and SNM data are obtained electronically from TracWorks® software.
- CaskWorks software provides external interface for modules of the SCALE-PC industry standard tool.



CaskWorks software automatic cask-loading pattern-planning menu

Cask: TMP01 (FINAL)

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Fuel Assembly Information (Final)

No.	MPC Loc.	Assy ID	Fuel Type	Disc Cyc.	Disc Date	Cool. Yrs	Disc Expo	Watts
1	MPC-68	UD6114	ANF-6	12	3/27/1997	6.0	37855.0	291.4
2	MPC-67	UD6050	ANF-6	12	3/27/1997	6.0	37831.0	290.4
3	MPC-66	UD6106	ANF-6	12	3/27/1997	6.0	37628.0	287.4
4	MPC-65	UD6066	ANF-6	12	3/27/1997	6.0	37474.0	286.5
5	MPC-64	UD6031	ANF-6	12	3/27/1997	6.0	37425.0	286.3
6	MPC-63	UD6038	ANF-6	12	3/27/1997	6.0	37244.0	285.0
7	MPC-62	UD6065	ANF-6	12	3/27/1997	6.0	37231.0	284.0
8	MPC-61	UD6098	ANF-6	12	3/27/1997	6.0	37242.0	283.5
9	MPC-60	UD7091	ANF-7	12	3/27/1997	6.0	36672.0	282.4
10	MPC-59	UD6043	ANF-6	12	3/27/1997	6.0	37090.0	282.4
11	MPC-58	UD7033	ANF-7	12	3/27/1997	6.0	36604.0	281.2
12	MPC-57	UD6025	ANF-6	12	3/27/1997	6.0	37029.0	280.9
13	MPC-56	UD6058	ANF-6	12	3/27/1997	6.0	36875.0	280.7
14	MPC-55	UD6064	ANF-6	12	3/27/1997	6.0	37717.0	280.3
15	MPC-54	UD6119	ANF-6	12	3/27/1997	6.0	36783.0	280.3
16	MPC-53	UD6095	ANF-6	12	3/27/1997	6.0	36726.0	279.0
17	MPC-52	UD6109	ANF-6	12	3/27/1997	6.0	36697.0	278.8
18	MPC-51	UD6044	ANF-6	12	3/27/1997	6.0	37583.0	278.7
19	MPC-50	UD7056	ANF-7	12	3/27/1997	6.0	36241.0	277.5
20	MPC-49	UD6033	ANF-6	12	3/27/1997	6.0	36556.0	274.0
21	MPC-48	UD6030	ANF-6	12	3/27/1997	6.0	36356.0	272.8
22	MPC-47	UD6068	ANF-6	12	3/27/1997	6.0	36791.0	271.4
23	MPC-46	UD6048	ANF-6	12	3/27/1997	6.0	36725.0	271.1
24	MPC-45	UD6019	ANF-6	12	3/27/1997	6.0	36661.0	269.8
25	MPC-44	UD5015	ANF-5	12	3/27/1997	6.0	33511.0	252.1

CaskWorks software reports customized to meet customer requirements

Deliverables

Westinghouse's CaskWorks software includes:

- CaskWorks software site license and documentation
- Custom CaskWorks software plant models
- On-site installation and training
- Phone support and one-year warranty with base scope
- Generic ORIGEN-ARP fuel-type libraries
- ShuffleWorks upgrade that provides cask-loading automation tools

Benefits

- Reduces operational process time for cask load planning
- Reduces cask certification and re-certification time
- Reduces risk of cask-loading errors by automating data manipulation and documentation
- Provides standardization for cask-loading procedures
- Interfaces with Westinghouse products (for example, ShuffleWorks, PoolWorks and TracWorks)

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