

# Decontamination and Decommissioning Plant Solutions

## SENTRY™ Spent Fuel Management System

*The Next Generation of Spent Fuel Protection*

### Background

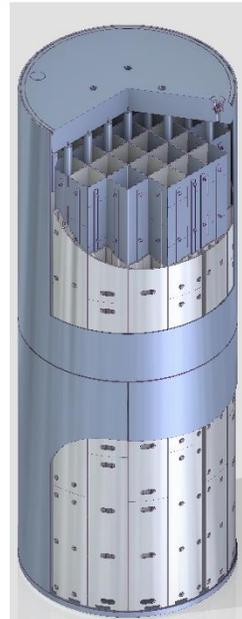
Plants in decommissioning have ongoing operational costs to maintain the fuel in the spent fuel pool until it can be safely loaded into dry cask storage. This also extends the decommissioning timelines because demolition activities on containment cannot take place until the fuel is off-loaded. Operating plants also face ongoing costs to acquire spent fuel casks to offload spent fuel to maintain full-core reserve in their spent fuel pools, Westinghouse has developed a solution to minimize these costs and timelines with the **SENTRY** Spent Fuel Management System (SFMS).

### Description

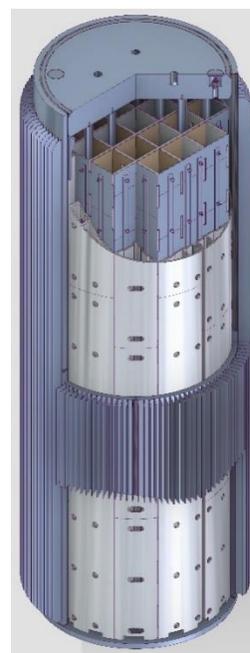
Our **SENTRY** system consists of four major components: the High Capacity Canister (W37), the Minimum Cooling Time Canister (W21H), the Transfer Cask (W110) and the Storage Cask (W180). Both the W110 transfer cask and the W180 storage cask can be configured for either of the two canisters. The maximum hook weight for transfer from the spent fuel pool is under 125 tons. The **SENTRY** W37 canister holds 37 PWR spent fuel assemblies (SFAs) with a total heat load up to 45kW. The **SENTRY** W37 canister also accommodates up to four damaged fuel assemblies. The **SENTRY** W21H canister holds 20 PWR assemblies. Its patent-pending design features, along with patent-pending features of the W180 storage cask, enable a total heat load up to 65kW, and a maximum per assembly heat load of 4.4 kW. The canister design capabilities are summarized in the following table.

Parameter	SENTRY W21H	SENTRY W37
Max heat load per canister (kW)	65	45
Number of assemblies per canister	20	37
Average heat load per assembly (kW)	3.25	1.22
Number of assemblies >3.2 kW	20*	--
Max heat load assembly	4.4	1.7
Max heat assemblies allowed	8	8
Min. Cooling Time (months) for max heat load assembly	18	36
Time to Fully Offload spent fuel pool including final core after shutdown** (mo.)	21	

*SENTRY System SNF Parameters*

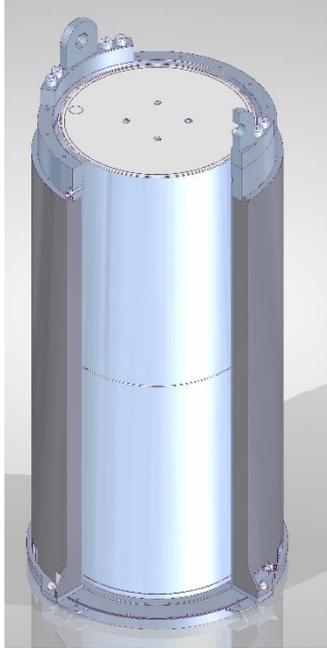


*Westinghouse's SENTRY W37 Canister*

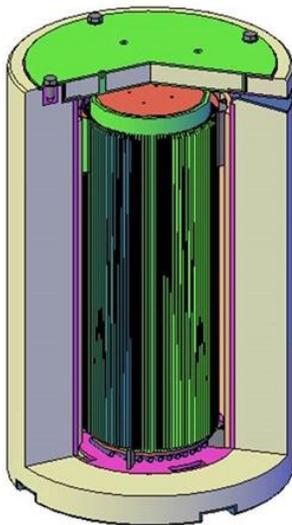


*Westinghouse's SENTRY W21H Canister*

The **SENTRY** system utilizes both canisters to expedite removal of all SFAs from the spent fuel pool after plant shutdown. The W21H canister is used to remove the high-heat load assemblies from the final core. All other fuel is placed into the high capacity W37 canister. Using the SENTRY canisters in a loading campaign to defuel the plant allows for shorter time from core off-load to dry storage into the independent spent fuel storage installations (ISFSI), which can reduce the critical path time for decommissioning by one year or more.



*SENTRY W110 with SENTRY W37 Configuration*



*SENTRY W180 with SENTRY W21H Configuration*

## Benefits

Westinghouse's SENTRY SFMS reduces the total cost of decommissioning by allowing spent fuel from the final core to be placed into dry storage starting 18 months or less after shutdown, enabling all spent fuel to be placed into dry storage by 20 months or less after shutdown. This shortened timeline results in substantially reduced ongoing "hotel costs" for maintaining the spent fuel pool safety systems, equipment, inspections, security, emergency planning, etc.

For operating plants, the SENTRY SFMS provides a lower cost product for addressing ongoing dry storage needs. The innovative design of the SENTRY W37 basket reduces costs of fabrication of the canister, thus providing direct cost savings to operating plant customers.

## Experience

Westinghouse has an extended history with dry cask storage systems. Westinghouse developed one of the first metal dry storage casks (the MC-10), and the first true multipurpose canister system to meet the rigorous design basis requirements of the U.S. Department of Energy (DOE) for Yucca Mountain. We leveraged our legacy as the original developers to re-acquire the intellectual property (IP) and CoCs for the FuelSolutions™ system. We have also acquired the VSC-24 IP and CoC and are now supporting these legacy systems for our utility customers.

Westinghouse is also experienced in ISFSI design and construction for multiple cask vendors. Our technical experts are well-trained in cask modeling, canister welding, fuel loading and radiological analysis of ISFSIs. Our services have been provided on most of the major cask systems used in the U.S.

With the introduction of the SENTRY SFMS, Westinghouse re-enters the cask supply market to become an integrated supplier of casks and services to better serve our customers and reduce their costs.