framatome

Optimizer

Skid Mounted High Filtration and Media System

Increase safety, reduce water contamination and radiation levels through incorporation of Nano technology into a new portable reactor cavity filtration and ion-exchange system

Challenge

The challenge is to deploy a reactor cavity and spent fuel pool cleaning system that can not only maintain pool visual clarity for refueling operations, but also reduces source term in the water. The system also needs to reduce outage critical path time for installation and removal as well as eliminate the need for filter or ion-exchange resin replacement during refueling operations.

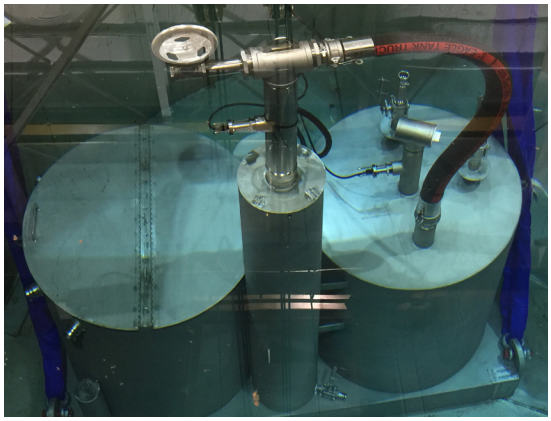
Solution

Framatome's Optimizer High Filtration and Media (HFM) System is **your source term reduction solution.** For use in refueling and spent fuel pools, the Optimizer HFM System includes the following:

- Self-contained shielded system
- Two-stage sub-micron filtration
- Single pass absolute efficiency filtration
- Variable pump speed control that extends filter life
- Ion-exchange polishing

The benefits of sub-micron filtration include:

- Absolute efficiency (0.027 µm)
- Fewest leachables
- Lowest clean differential pressure
- Highest tensile strength
- No downstream decay



Customer benefits

- Reduce critical path with one-pick
- Increase efficiency of use with easy installation, operation and removal
- Enhance performance with no downstream filter decay

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

The HFM System consists of five major components:

- Skid base with four pad-eye lift lugs
- Filter vessel (two-stage) with lead radiological shielding
- Pump chamber and pump with split discharge
- Ion-exchange vessel with lead radiological shielding
- Control panel with variable frequency drive (VFD) automation and flow

Filter Vessel

The Framatome HFM requires six filters installed in the first stage and six filters installed in the second stage. This filtration strategy ensures enhanced filtration capability with a broad spectrum influent by using a two-stage filtration concept that removes larger particles in the first stage, and smaller particles in the second stage, thereby reducing the likelihood of premature filter blinding, and therefore extending the service life of the filter during all aspects of refueling operations.

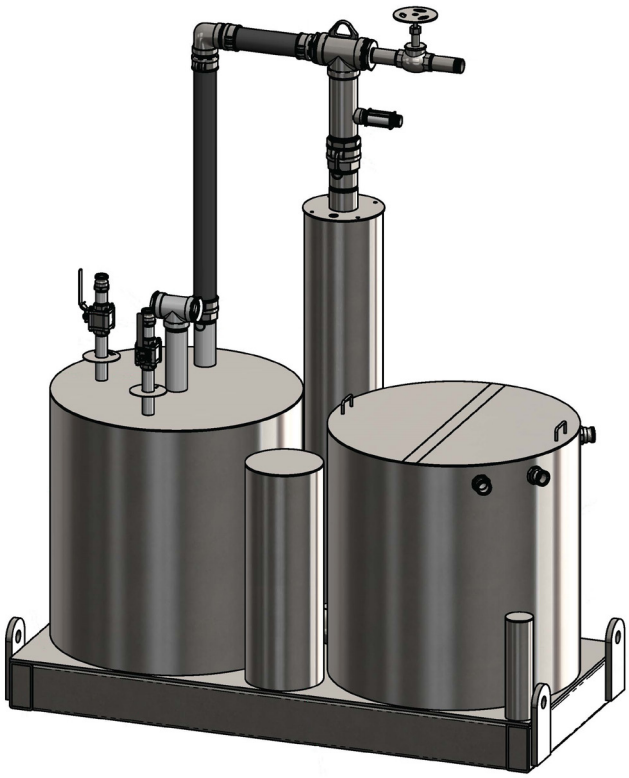
Ion-Exchange Vessel

The ion-exchange vessel is a fully shielded 10-cubic foot vessel designed to be pressurized for typical ion-exchange conditions. It has been built to ASME Boiler and Pressure Code Section VIII, Div. 1 (not code stamped). The vessel is 32 inches in diameter and 34 inches in height.

Are You Getting the Most From Your Filter?

Constant speed filter systems will prematurely end the life of a filter (typically 60 percent loss) due to pump cavitation. Cavitation can cause a spike in surface radiation.

Framatome's HFM System uses VFD technology, combined with flow and vacuum sensors, to regulate the pump and prevent premature cavitation failures. The HFM System extends the life of the filter (typically two and a half times) and the loading does not experience a hydraulic cake-collapse (like compressing a sponge under pressure) that will restrict flow. The HFM System is designed to save the end user time, money and resources before, during and after critical path.



Control Panel

Proper pump rotation is necessary to ensure proper operation of the system and prevent damage to the pump. Control of pump speed is achieved using a VFD. An operator interface is provided via the door mounted touch screen human machine interface (HMI). System flow is measured at both the primary system flow sensor, which indicates full system flow, and the secondary system flow sensor, which measures only the ion-exchanger flow. These flow signals are fed back to the door mounted flow indication panel, and used by the VFD to control pump speed.

Framatome can custom design a HFM System to meet specific plant needs. Framatome's Nuclear Products division is focused on the products and services offered today and new products and services to be developed for the future in order to deliver innovative and reliable solutions with the highest quality and best value in the industry.

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