

Case Study - Reduced dose rates during sample processes using ClearView® Radiation Shielding***Executive Summary***

LaSalle Station reduced dose rates to chemistry personnel through the use of an innovative new see-through radiation shielding product; ClearView RS. The impact was 30% chemistry decon sampling evolution dose reduction during the 2017 Unit 2 L2R16 refueling outage.

About

LaSalle County Nuclear Generating Station is an Exelon Corporation owned and operated two unit, boiling water reactor, nuclear power plant located in Marseilles, Illinois.

Michael Wakeley is the Senior ALARA Analyst in the Radiation Protection and ALARA Department. Michael implemented the plan for the first use in the industry of the radiation shielding product.

The Challenge

During chemical decontamination, samples of the systems contents are taken to verify the effectiveness of the process.

Chemistry personnel must be able to effectively view the sample preparation process and prior to now, there was no cost effective, transparent shielding product that offered high clarity and low distortion. The result was the personnel were not shielded during the process.

The Solution

A transparent radiation shield made of a new, groundbreaking product from Radium, Inc. called ClearView RS, was designed to the customers' specifications. The shield was 1.5" thick, 14" wide and 23" tall and was set in an aluminum frame at a 60° angle (shown below). The frame featured a convenient work platform on the source side of the shield. The shield was designed to provide 50% attenuation.



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ClearView RS Shielding is a patent pending product of Radium Inc. www.radiuminc.com/clearview-radiation-shielding/

ClearView RS is a radiation shielding product that is liquid in nature and transparent. It offers significant radiation attenuation with a Half Value Layer of 1.5" (3.8 cm). ClearView RS allows personnel to be shielded from a radiation source but still view the source in high resolution and clarity, unlike leaded glass or acrylic which is expensive, heavy and offers poor resolution.

Of Note The shield was required for the refueling outage which started about 12 days from the date the request was made for the shield. Nu-Energy Technologies, Inc., Radium Inc. and the client worked as a team to design, manufacture and deliver the shield to the client site in 9 days, leaving time for training on the use of the shield prior to the beginning of the outage.

The Results



Mike Wakeley taking a contact dose reading. *Used with permission of Exelon Corp.*

The following field results were provided by the client:

"The ClearView RS shield (1.5" thickness) produced a true 50% reduction on dose rate and allowed chemistry personnel to clearly view their sample preparation and other work.

Dose rates were tested from multiple distances and dose rates were taken unshielded and shielded with the same geometry.

***A Ram Gam-1 survey meter was used to obtain all dose rates.*

The ClearView RS shield was used when preparing Chem Decon and elevated Reactor Water Samples. Co60 was the main dose contributor in the samples collected.

A total exposure reduction of 30% was seen for the entire Chem Decon sample preparation process for the Chemistry Technicians over the course of the outage. This is compared to previous sample preparation evolutions without the ClearView RS shield.

The ClearView RS shield was also used in a fume hood and as a table top sample preparation station and the shield was easily moved around the lab where it was needed."

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