Siflex®

SHIELDING

Radiation Control Manufactured by

American Ceramic Technology, Inc.

The Original

Lead Free Shielding

American Ceramic Technology, Inc.

Aubri Morris, Process and Project Engineer at ACT
Jim Bacquet, 32 years at Entergy, *Retired*
Dan Stoltz, 29 years at Entergy, *Retired*
Martin Phalen, Radiation Protection Manager,
Arkansas Nuclear One/Entergy

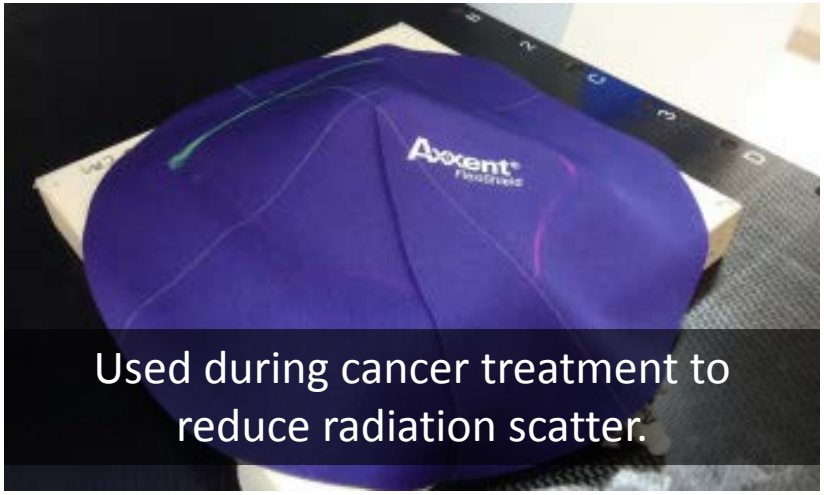
NSA/INPO Innovation Expo
May 22, 2018

In the early 2000's, ACT, Inc. developed FlexiShield®, an innovative, never before available silicone medical device highly loaded with tungsten.

Medical Development

- 2004

FlexiShield®



Used during cancer treatment to reduce radiation scatter.

During this time, Entergy/ANO ALARA Personnel were researching an alternative form of radiation shielding leading them to ACT, Inc.

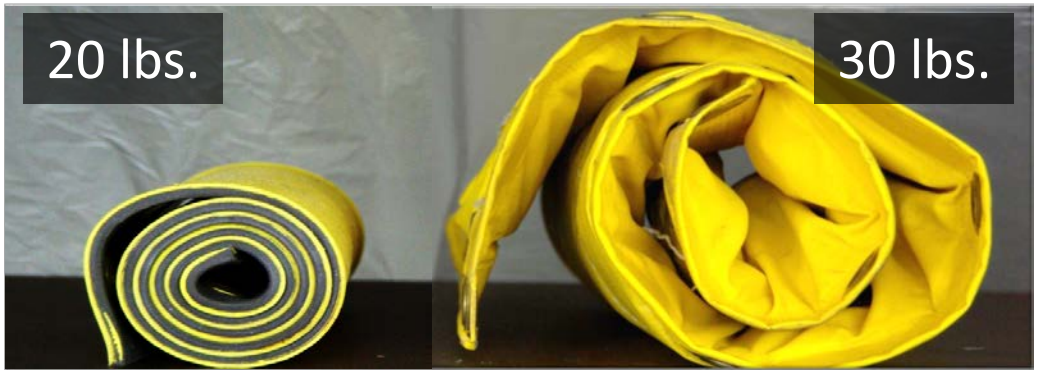
Medical Development

- 2004

Nuclear Development

- 2005

GOAL: DEVELOP A BRAND NEW PRODUCT WITH SUPERIOR SHIELDING ABILITIES COMPARED TO LW



The collaboration between Entergy/ANO and ACT led to the development of a flexible, lead-free tungsten shielding alternative.

Medical Development

- 2004

Nuclear Development

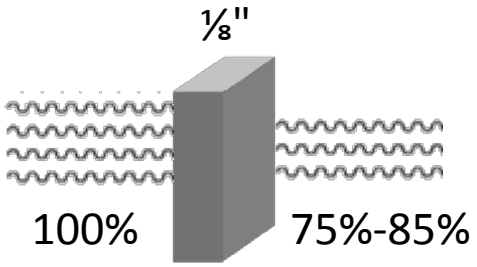
- 2005

Nuclear Sales

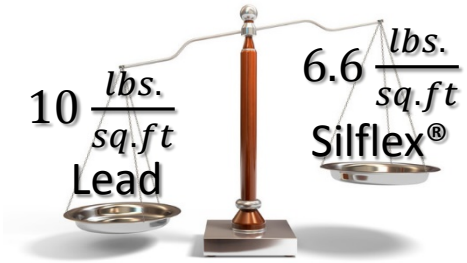
- 2007

*Product used at most US & Canadian plants.

Entergy/ANO ALARA personnel were researching an alternative form of shielding with specific goals in mind.

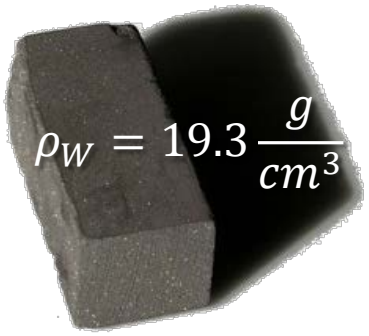


EFFECTIVE SHIELDING



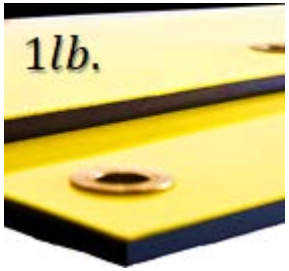
*For Co-60 source

LIGHTER SHIELDING



HIGHLY LOADED

181,333,333 Pure Tungsten Particles



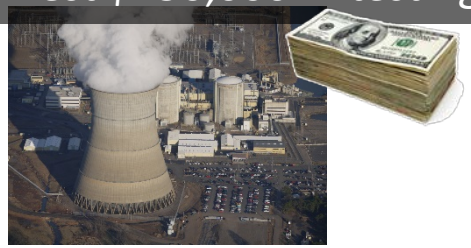
Continuous use at 250°C

Class A Fire Rating

*Limited-Combustible

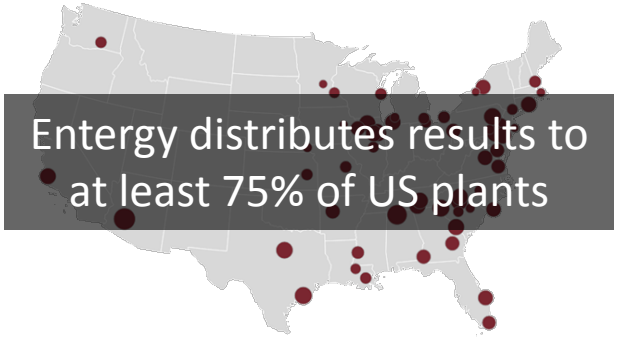
**E84 Testing and ASTM 701 Testing.

Entergy/ANO & ACT invest $250,000 in testing



INDUSTRY SAVINGS: $18,750,000

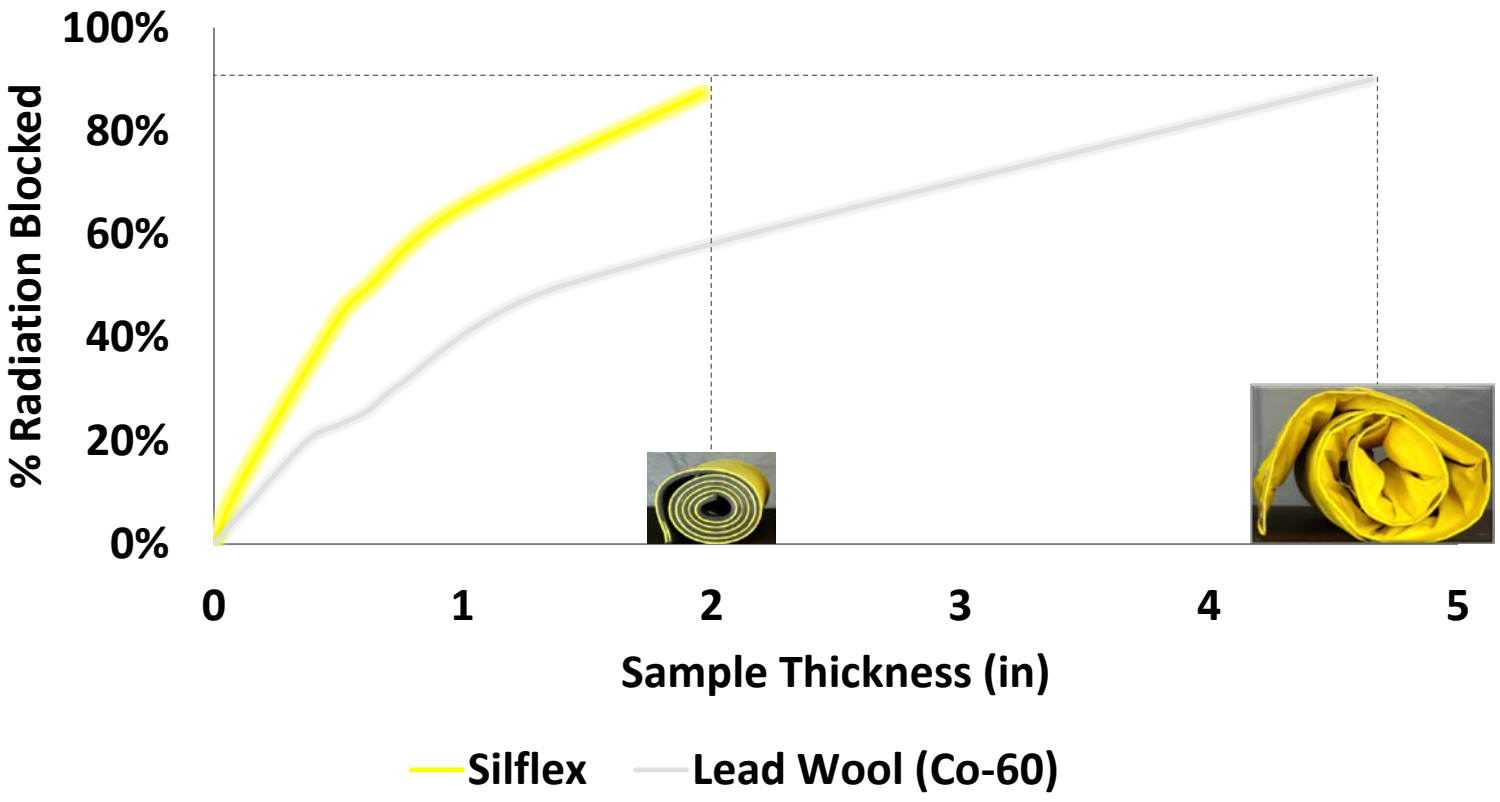
Silflex® undergoes hundreds of hours of rigorous testing



Entergy distributes results to at least 75% of US plants

Entergy certifies Silflex® Shielding

Developed was Original Silflex® Shielding, a cutting-edge shielding alternative less than half the thickness and two-thirds the weight of LW.



*As Tested by Savannah River Remediation, LLC
**NPP Radionuclides: Co-60, Co-58, Cs-137, Sr-90

Silflex® SHIELDING
Radiation Control manufactured by
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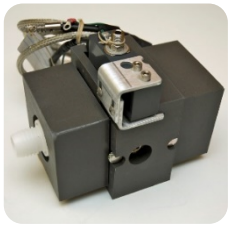
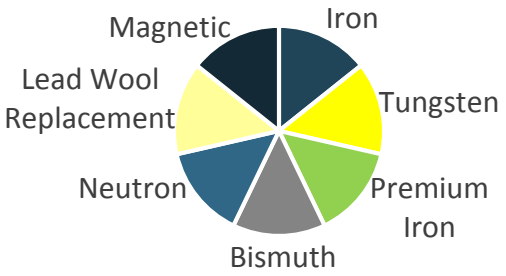
The collaboration between Entergy/ANO and ACT, Inc. brought innovation that met and exceeded every product requirement.

EASILY DECONTAMINATED

SMALL PIPE SHIELDING



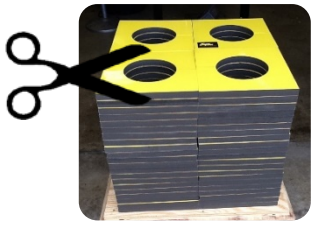
CUSTOMIZABLE



SEVERAL NON-TOXIC BLENDS AVAILABLE

HIGHLY RESILIENT TO BORIC ACID AND SODIUM HYDROXIDE

NON-TOXIC, NO MIXED HAZARDOUS WASTE



EASILY TRIM, CUT, ABRADE, DRILL, PUNCH

Dramatic cost savings come in the form of hazardous versus non-hazardous mixed waste disposal fees.

It is generally 75% cheaper to dispose of Silflex® Shielding compared to Lead Wool.

Silflex® Shielding provided dramatic cost-savings for the nuclear industry that were recognized again and again.

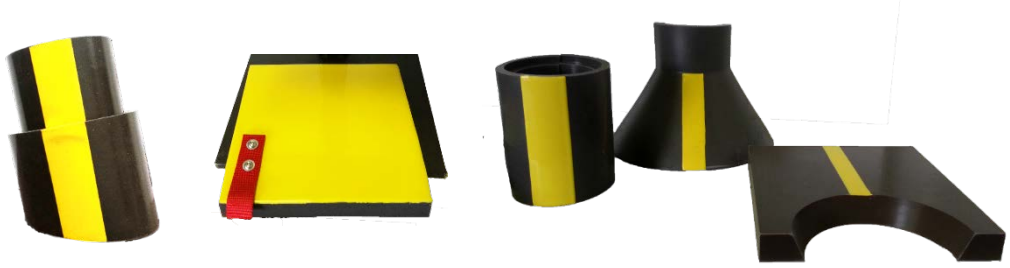
WINNER OF 2011 NEI TIP AWARD (TOP INDUSTRY PRACTICE AWARD)

12 REM less than predicted | Twice as effective as lead

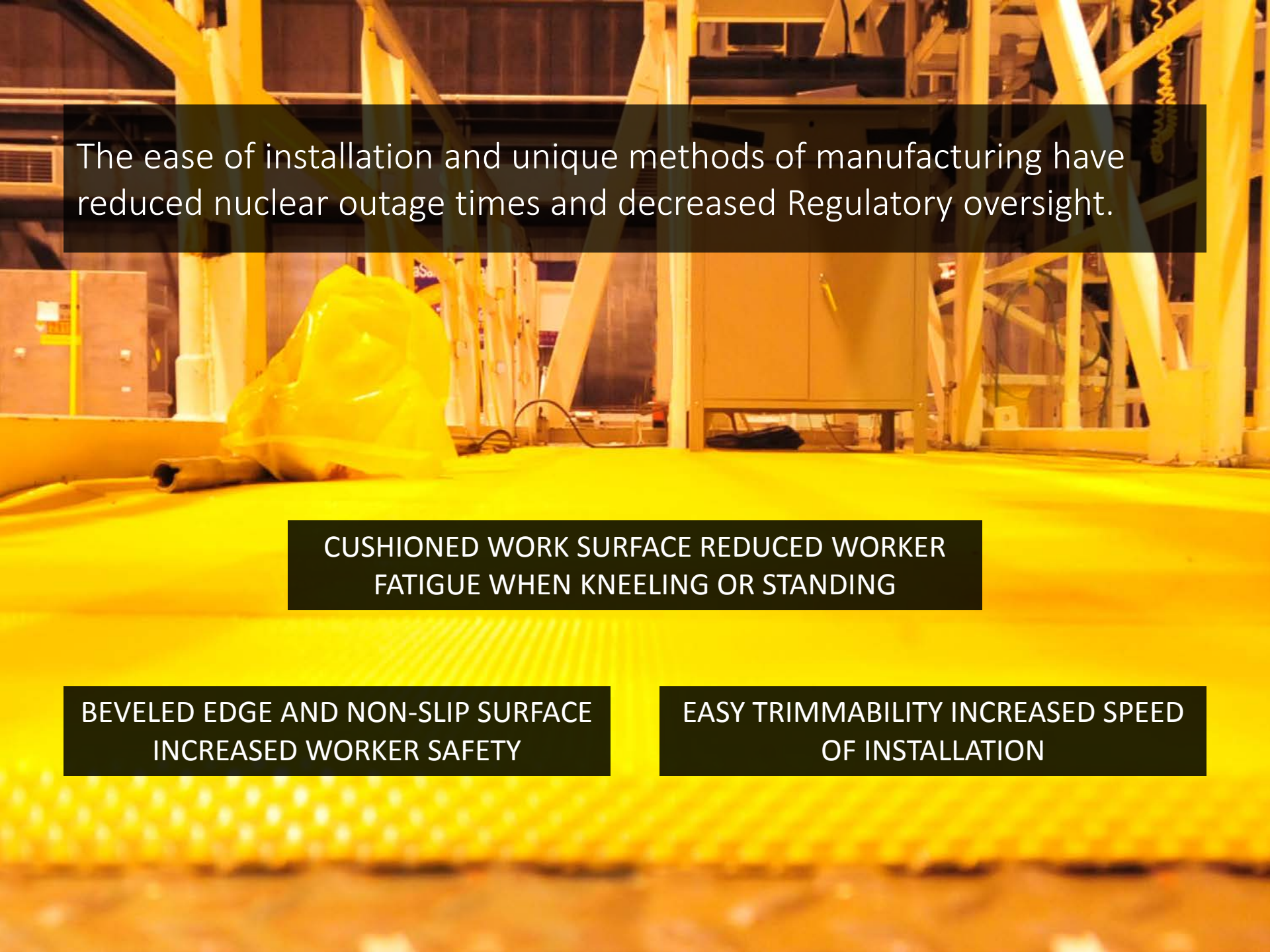
→ **≈120 outage workers normal outage exposure**

Arkansas Nuclear One – 168 pieces

Underhead shielding with magnetic tiles is often used, creating a shielding cage capable of pulling through ¼" SS cladding and curved surfaces.



Magnet supports 50 lbs. of shielding

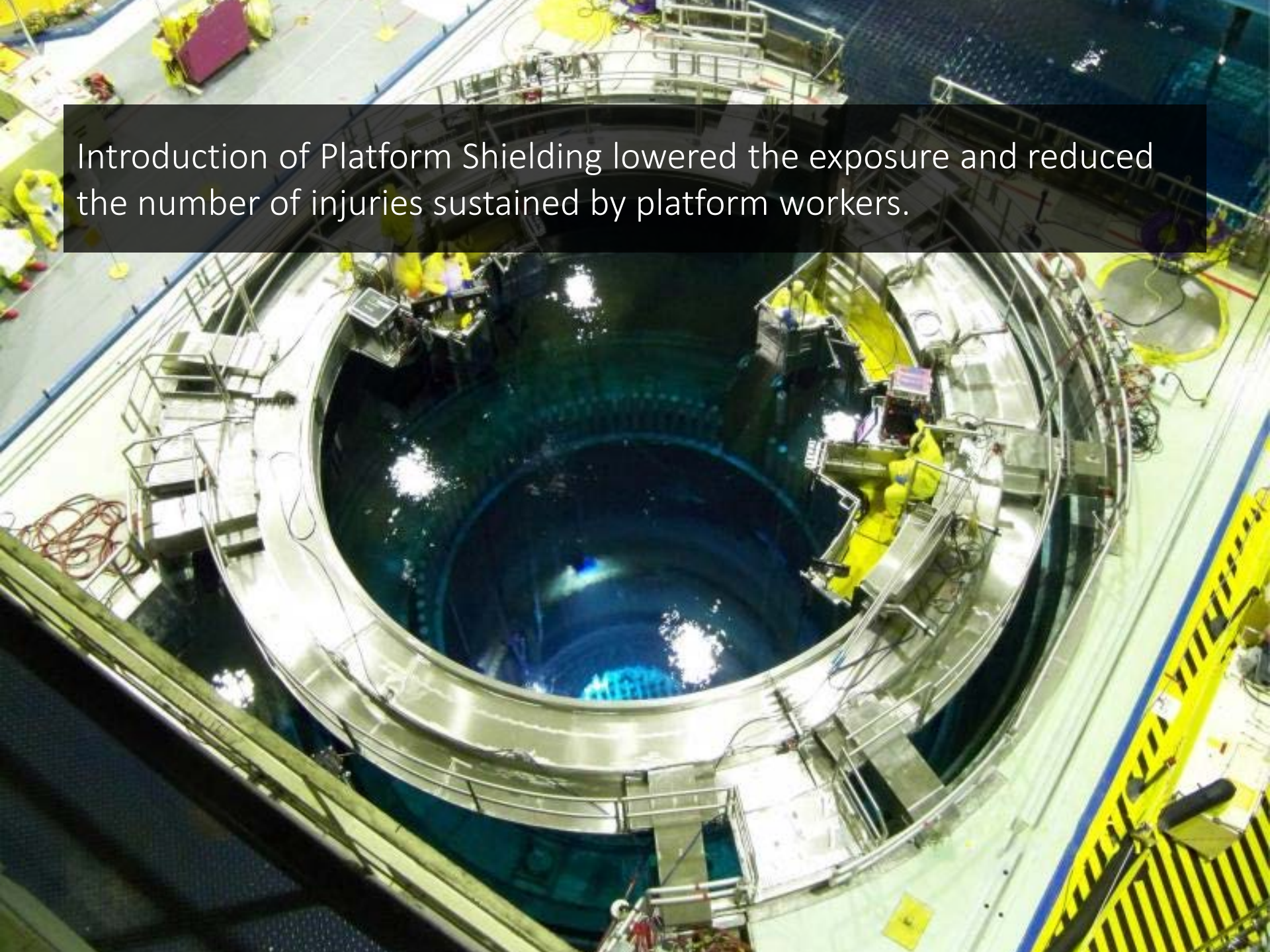


The ease of installation and unique methods of manufacturing have reduced nuclear outage times and decreased Regulatory oversight.

CUSHIONED WORK SURFACE REDUCED WORKER FATIGUE WHEN KNEELING OR STANDING

BEVELED EDGE AND NON-SLIP SURFACE INCREASED WORKER SAFETY

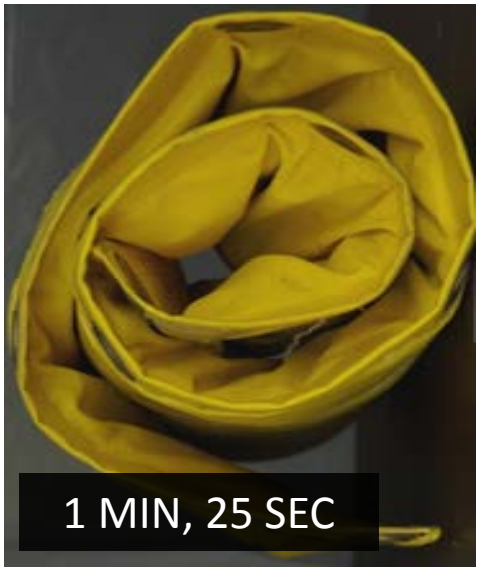
EASY TRIMMABILITY INCREASED SPEED OF INSTALLATION

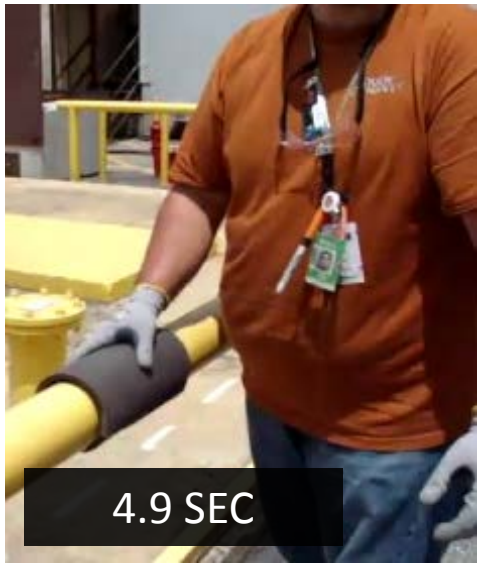

Introduction of Platform Shielding lowered the exposure and reduced the number of injuries sustained by platform workers.

Less weight in shielding and the ease of transporting and installing has led to reduced workplace injuries and as a result lower costs to plants.

Scenario:
100 pieces to install (12"x36")

Non-magnetic shielding: 30 lbs./piece





Magnetic shielding Silflex®: 19.8 lbs./piece

2.36 hrs., 3000 lbs. vs. 8.16 min., 1980 lbs.

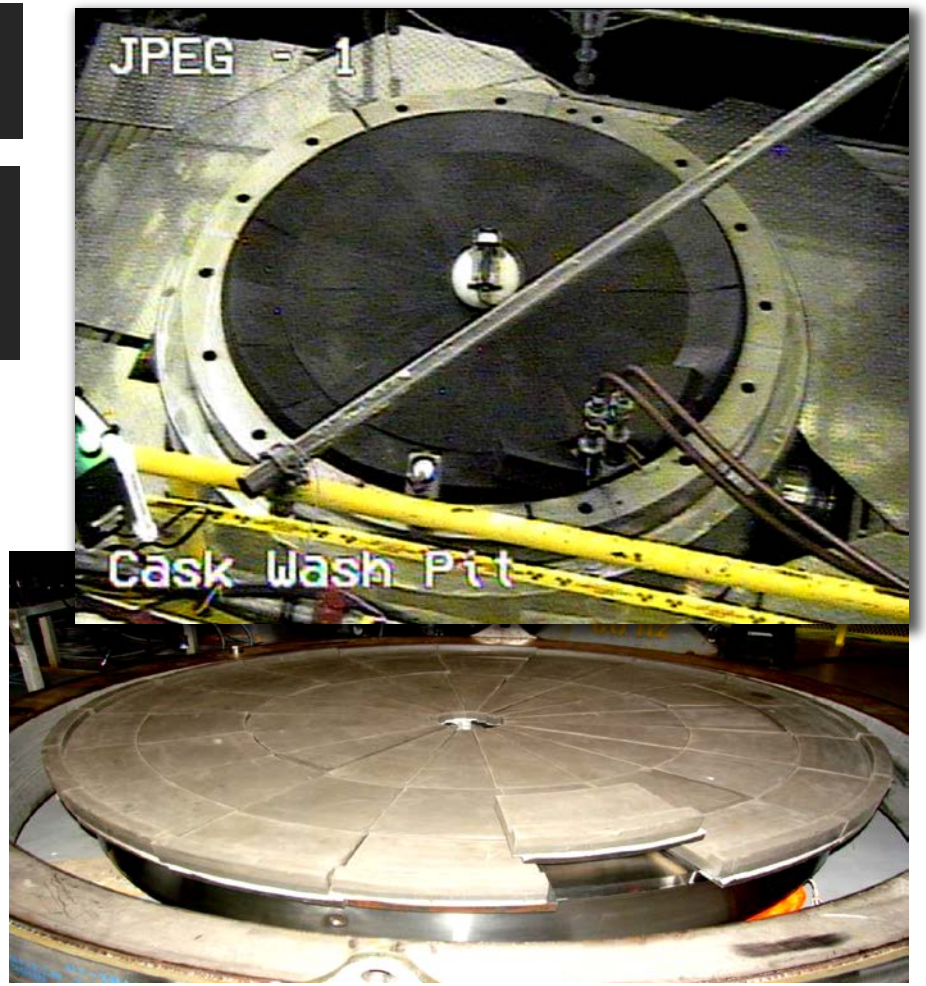
Savings come in the form of less workers compensation, medical treatment, injury investigations, Regulatory oversight, etc.

Expenses from Injury:

Silflex® Neutron Shielding has provided new solutions to dry cask storage enabling both neutron and gamma radiation shielding.

APPROX. 75% THINNER THAN BORATED POLY FOR SUPERIOR SHIELDING

UNIQUE SILFLEX® PROPERTIES EQUATES TO HIGHER TEMPERATURE USAGE AND LOWER DOSE



Lead Wool Replacement provided superior properties, competitive pricing, and leasing options versus high temperature LW blankets.

St. Lucie Nuclear Power Plant teamed up with ACT, Inc. during the current outage reducing time in containment and overall dose.

90% Fewer Crane Picks, from 10 to 1!

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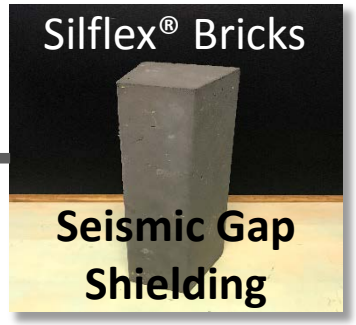
Reducing dose incurred may not cut direct costs, but excellent ALARA performance leading to less Regulatory oversight effects the bottom line.

COST SAVING GETS AWARDED



24 HRS. OF CRITICAL PATH SAVED


LIGHTWEIGHT
CUSTOMIZABLE
NON-TOXIC
RUGGED
Sifflex®
SHIELDING
Product of American Ceramic Technology, Inc.
COST EFFECTIVE
HEAT TOLERANT
SUPERIOR SHIELDING TECHNOLOGY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QUESTIONS?