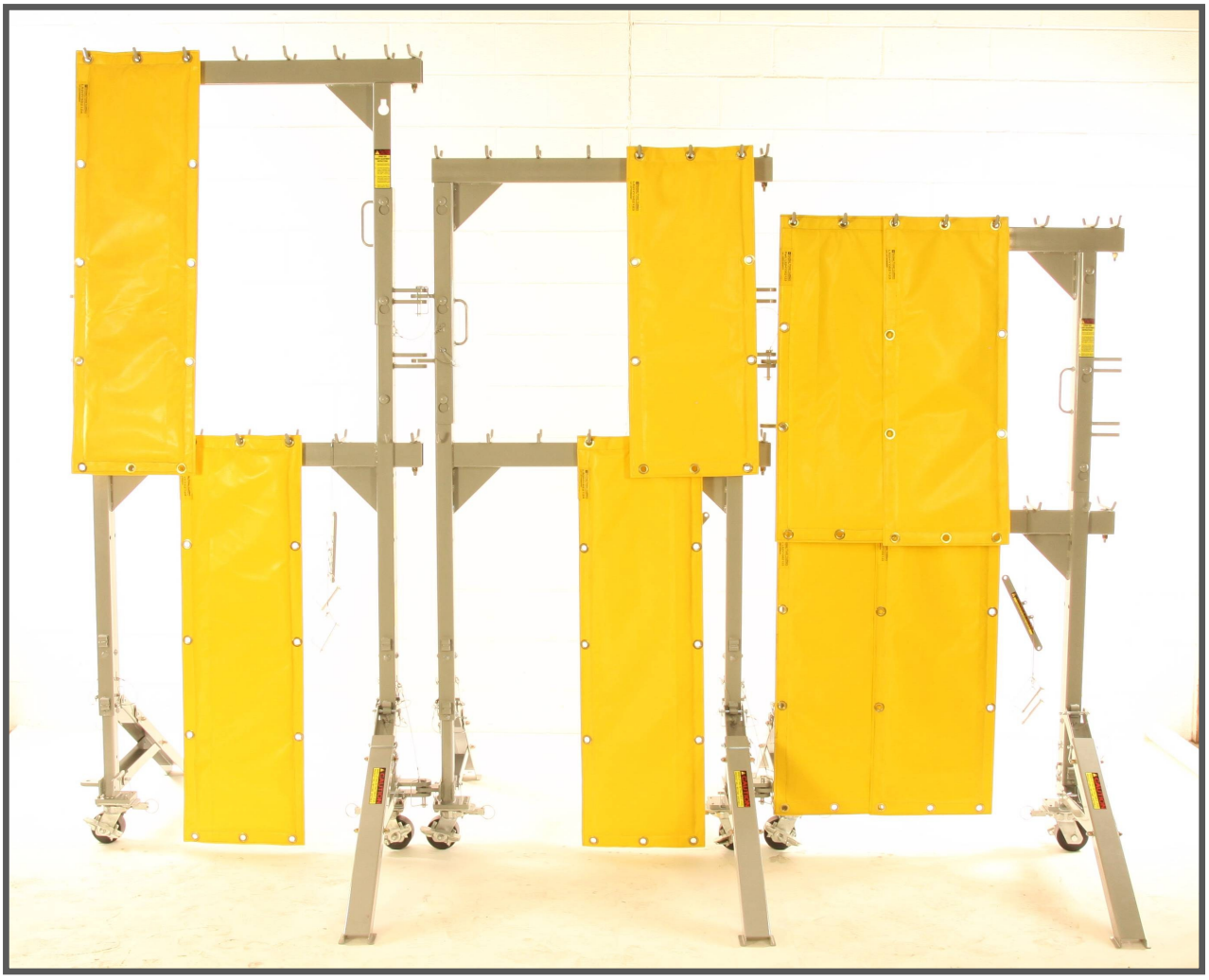
SERPENTINE SUPPORT SYSTEM

NUCLEAR POWER OUTFITTERS
a subsidiary of eichrom

USER'S GUIDE



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ORDERING INFORMATION

NPO's Serpentine System is designed to provide virtually any shielding wall configuration, including low dose waiting areas, portable frisking caves, shadow shield walls, and shields for rad materials transfers.

This strong and sturdy system was designed to minimize streaming, reduce setup time and allow for easy movement in and out of virtually any area.

NPO Serpentine Racks are compatible with 10#/sq. ft. and 15#/sq. ft. blankets.

Part Numbers:

Serpentine Rack	**L62MRS037-8**
Knuckle Adapter	**L62MRSKNA**
Retractable Legs	**L62MRSRL**

To purchase accessories or replacement parts or to learn how NPO can deliver successful ALARA engineered solutions for you, please contact us at:

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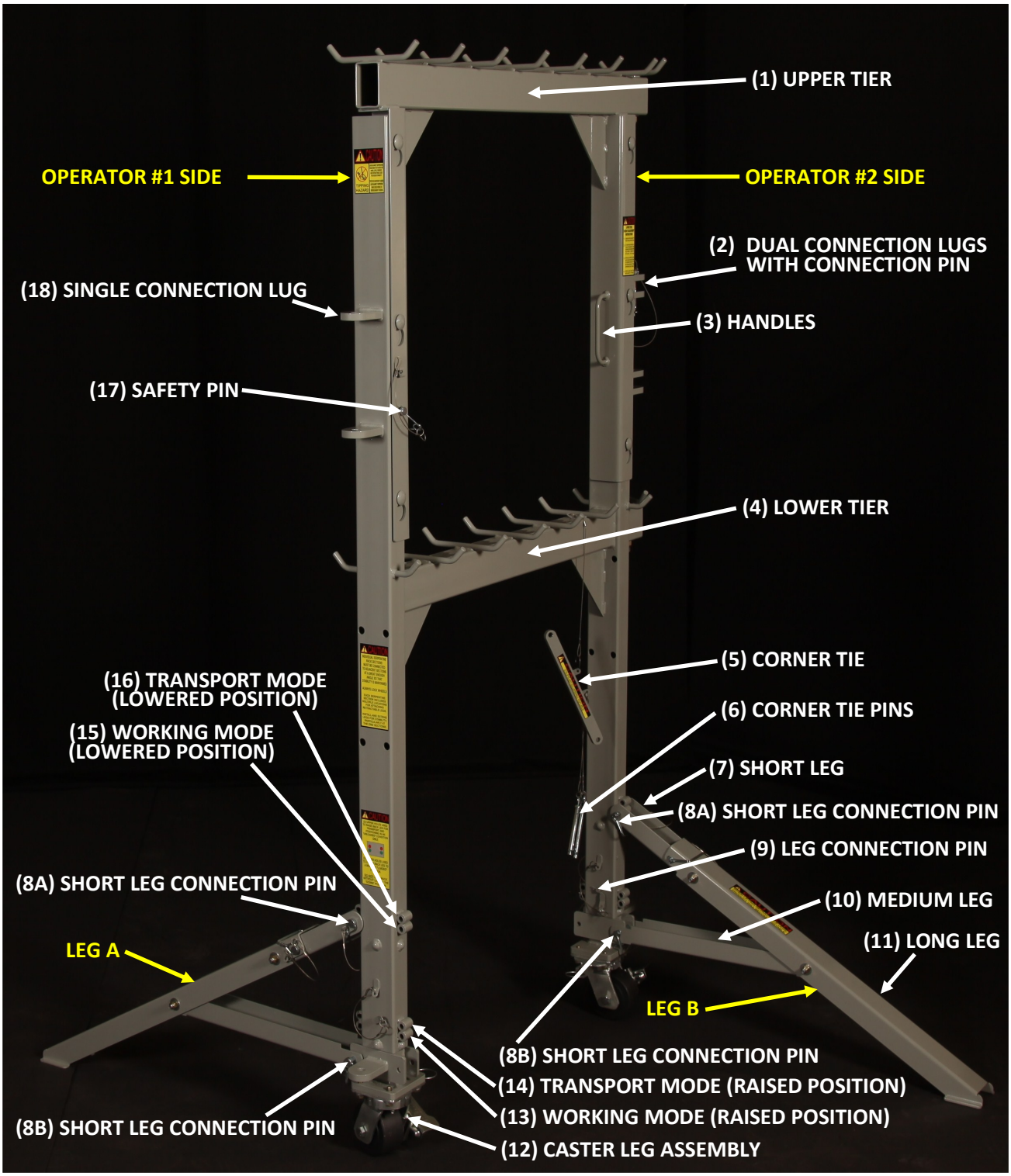
PARTS


(1) UPPER TIER
OPERATOR #1 SIDE
OPERATOR #2 SIDE
(2) DUAL CONNECTION LUGS WITH CONNECTION PIN
(18) SINGLE CONNECTION LUG
(3) HANDLES
(17) SAFETY PIN
(4) LOWER TIER
(5) CORNER TIE
(16) TRANSPORT MODE (LOWERED POSITION)
(6) CORNER TIE PINS
(15) WORKING MODE (LOWERED POSITION)
(7) SHORT LEG
(8A) SHORT LEG CONNECTION PIN
(9) LEG CONNECTION PIN
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(10) MEDIUM LEG
LEG A
(11) LONG LEG
LEG B
(8B) SHORT LEG CONNECTION PIN
(14) TRANSPORT MODE (RAISED POSITION)
(8B) SHORT LEG CONNECTION PIN
(13) WORKING MODE (RAISED POSITION)
(12) CASTER LEG ASSEMBLY

RAISING AND LOWERING LOWER TIER

CAUTION: FAILURE TO COMPLETE STEP ONE CAN CAUSE RACK TO FALL, CAUSING BODILY HARM AND RACK DAMAGE. REQUIRES TWO OPERATORS.

The following steps are for raising the lower tier. Re-adjust for lowering the lower tier.

Step 1: Brake and lock the caster wheels (#12) with the 2-inch thick wheels parallel to the rack tiers (see figures C and D).

Step 2: Ensure both legs are in lowered position working mode (#15) (see figure E), and both operators are standing on same side of rack.

Step 3: Operator #1 stabilizes rack by pushing against Leg A while Operator #2 removes short leg connection pins (#8A and #8B)) and removes Leg B.

Step 4: Both operators move to side of rack and slowly lay rack down flat on floor.

Step 5: On Leg A, while laying flat, remove short leg connection pins (#8A and #8B) and then remove Leg A.

Step 6: Pull both leg connection pins (#9) and slide caster leg assembly (#12) out 8 inches and re-connect leg connection pins (#9) to rack frame.

Step 7: After extending legs and while rack is still laying flat, reconnect Leg A short leg connection pins (#8A and #8B) to raised position working mode (#13).

Step 8: Both operators stand to sides and lift rack back to vertical position.

Step 9: Once standing, with both operators on same side, Operator #1 stabilizes rack against Leg A while Operator #2 re-attaches Leg B by connecting pins (#8A and #8B) to raised position working mode (#13).

Correct position:
Swivel lock activated and wheel lock locked

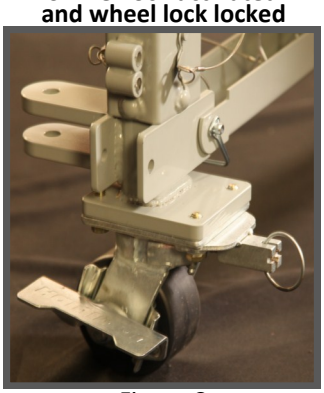


Figure C

Incorrect position:
Swivel lock not activated and wheel lock unlocked

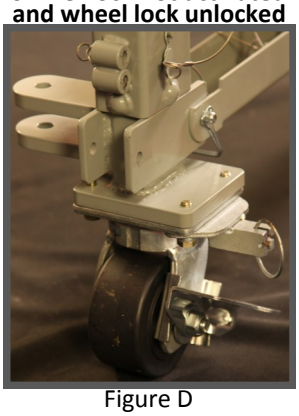


Figure D

Working position, as pictured (bottom hole)
Transport position, not in use as pictured (top hole)

Figure E

RAISING AND LOWERING UPPER TIER

Step 1: Uncage and remove safety pin (#17) (see figure A).

Step 2: To remove upper tier (#1), place hands on handles (#3) and lift one inch; then, pull away from rack and towards your body (see figure B).

Step 3: To replace upper tier at higher or lower level, identify preferred set of holes; push upper tier away from body and towards rack, placing over screw heads and lowering one inch.

Step 4: Re-install and cage safety pin.

Figure A

Figure B

LINKING RACKS

Step 1: With two racks standing side-by-side, ensure all retractable legs are in lowered position working mode (#15).

Step 2: When facing the racks, the left rack will have dual connection lugs (#2) on the right side of the frame; the right rack will have a single connection lug on the left side of the frame.

Step 3: Uncage two dual connection pins (#2) and lift out of dual connection lugs (#2).

Step 4: Slide racks together so the three lugs interlace.

Step 5: Replace and re-cage both dual connection pins (#2) (see figures F and G).

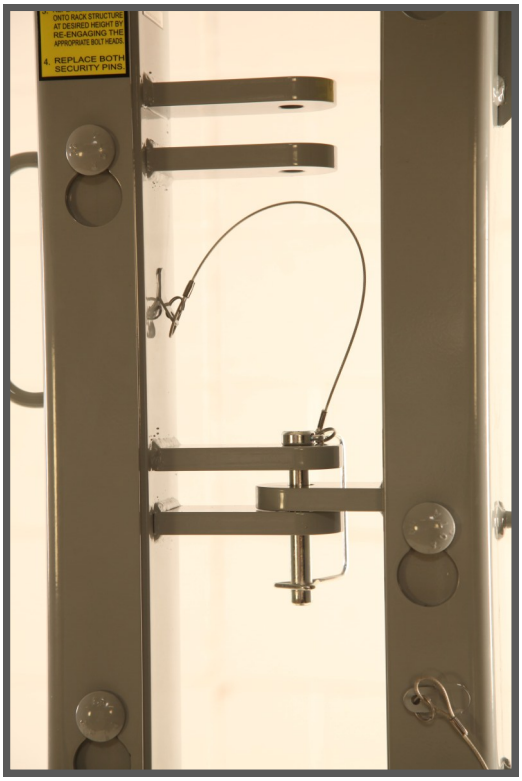


Figure F

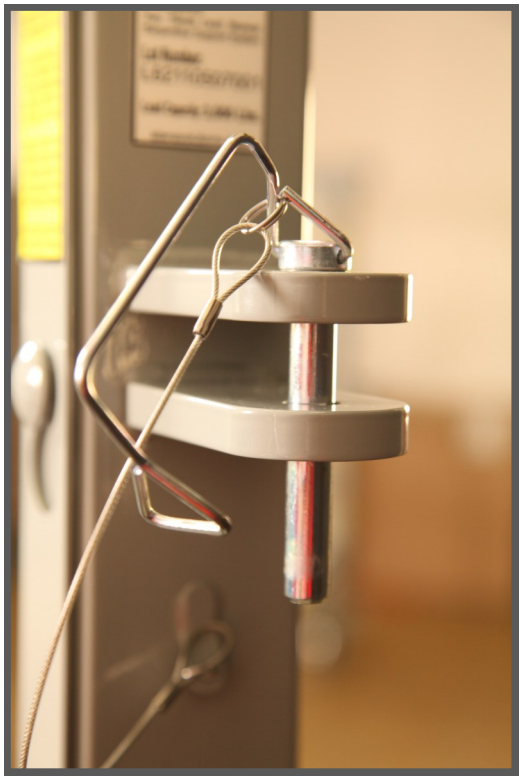


Figure G

TRANSPORTING RACKS

This method raises the retractable leg feet by 3/4 inch from the lowered position working mode (#15) to the lowered position transport mode (#16).

Step 1: Ensure both retractable legs are in the lowered position working mode (#15), and both operators are standing on the same side of the rack.

Step 2: Operator #1 stabilizes rack by pushing against stabilizing Leg A while Operator #2 removes the short leg connection pin (#8) on Leg B (see figure H).

Step 3: Operator #2 then raises the leg 3/4 inch to the next uppermost connection hole, and re-cages the short leg connection pin (#8).

Step 4: Both operators will move to the opposite side of the rack and repeat steps 1-3 to raise other leg.

This shows leg pinned in lowered position working mode (#15). The goal is to move and re-pin leg in lowered position transport mode (#16) (see arrow).

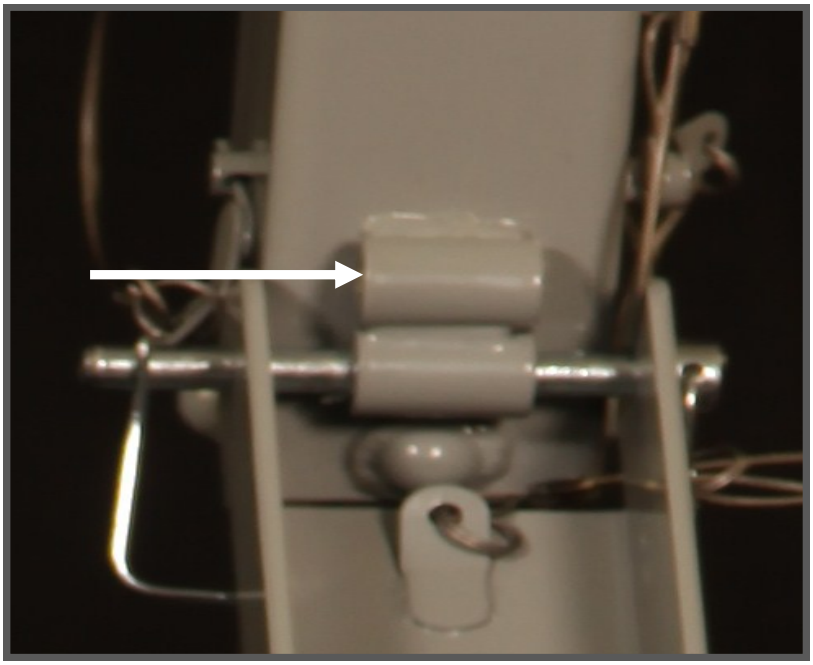


Figure H

TRANSPORTING TWO ASSEMBLED RACKS

Refer to section Linking Racks.

Step 1: After linking two racks, rotate one rack 90 degrees in either direction, forming an L-shape (see figure J).

Step 2: Install the corner tie (#5) (see figure K) using the two attached corner tie pins (#6). The pins slide through the corner tie and lower tier. Once through, cage the corner tie pins. (see figure L)

CAUTION: BEFORE MOVING RACKS, MAKE SURE ALL BLANKETS HAVE BEEN UNLOADED.

Step 3: Move racks.

Figure J

Figure K

Figure L

LOADING BLANKETS

The following statement calculates blanket loading as being equal to one layer on one side. Maximum total rack loading is three layers per side or six total layers. Multiply load results by six for total rack blanket loading.

NPO Serpentine Rack's use NPO standard 15#/sq. ft. blankets; 10#/sq. ft. blankets may also be used.

NPO blanket part numbers:

L52HY552123 (12" X 36") (45# ea.) and L52HY552124 (12" X 48") (60# ea.)
Blankets are hooked onto racks in overlapping fashion.

Three standard height conditions:

Lowest configuration at 79" high:

Upper tier = four 12" X 36" blankets (180#)
Lower tier = four 12" X 36" blankets (180#) or four 12" X 48" blankets (240#)
Note: If upper tier is raised 12" in this configuration, you will need four 12" X 48" blankets on the upper tier instead of the four 12" X 36" blankets.

Mid configuration at 87" high:

Upper tier = four 12" X 36" blankets (180#)
Lower tier = four 12" X 48" blankets (240#)

Max configuration at 99" high:

Upper tier = four 12" X 48" blankets (240#)
Lower tier = four 12" X 48" blankets (240#)
Note: When rack is in max configuration and fully loaded with six layers of 12" X 48" blankets (qty. 48), the total maximum blanket load is 2880 pounds. Rack weight unloaded is 180 pounds; rack weight plus blankets' weight is 3060 pounds.

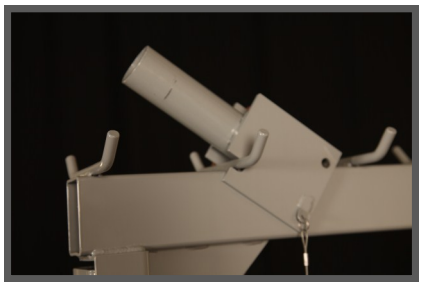
Rack sizes:

35" (caster-to-caster width) X 99-7/16" (height maximum). Rack size when linked in a 90 degree dual configuration is 61-3/8" X 31-11/16" (width). This configuration will fit through a standard-sized door.

ACCESSORIES

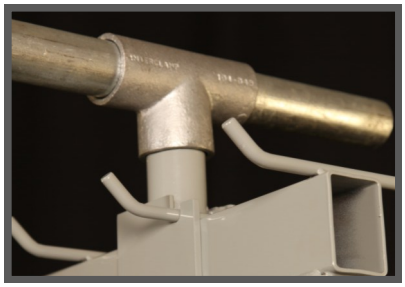
Knuckle Adapter (sold separately)

The knuckle adapter provides a 6-inch long stub tube with an outside diameter (O.D. 1 ½" SCHD. 80 pipe) compatible with standard scaffolding. The stub tube is fully welded to an adapter knuckle, which fits over the upper tier. The Serpentine Support System maintains a full range of motion and loading capabilities with the adapter in place. The design allows for tie-off to existing scaffolding in instances when engineering requires additional support structure.



Step 1

Step 2



Step 3

Retractable Legs (included)

Each Serpentine Rack comes complete with two detachable legs (#'s 7, 8, 10 and 11). These may be attached to either side of the frame.

Eichrom Technologies, and its subsidiary NPO, have a 35 year history of collaboration with the nuclear industry to protect people and environment. We enable the efficient measurement and control of radioactive materials and processes through chemical separation technology, radiation shielding and contamination control. With comprehensive manufacturing, chemistry and radiochemistry laboratories, and an ISO 9001:2008 registered quality system, we offer an unparalleled level of service to professionals in nuclear power, government programs, academia and nuclear medicine. Our customers benefit from access to our extensive product lines, which include chemical extraction and ion exchange resins, high-resolution alpha/beta filters, sampling smears, radiation shielding/containment systems, contamination control products, and NIOSH-approved supplied air respirators.

Furthermore, at Nuclear Power Outfitters, we are fluent in ALARA objectives and have delivered hundreds of ALARA shielding solutions across the nuclear industry. We work with our customers to maximize the effectiveness of their applied shielding and reduce the dose expenditure associated with the installation of temporary shielding, and we look forward to providing you continued...

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ISO 9001:2008 SGS

Printed 8/2011