NSF Presentation

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Questions

1. **How have the Section 4 Hair Entrapment, and Section 5 Body Entrapment provisions been interpreted?**
   - In the past?
   - Currently?
   - Rationale?
   - How are interpretations made?

Applicable Body Block Element

Section 1.5 Definition

"…its actual size for test purposes is the smallest size that will completely shadow the suction cover/grate being tested…."

Table 1 of ASME/ANSI A112.19.8

Table 1 Applicable Body Block Element — Calculation of Removal Force

Bather	Min. Width Blocking Element to Shadow Tested Cover	Blocking Element Length = 1.2777 × Width	Basis is Child Width	Ratio of Element Width to Child Width	Ratio Cubed	Times Child Weight = 30 lb	One-Half Weight	Maximum Removal Effort No.
99th percentile male	18	23.0	9	2.00	8.00	240	120	120
	17.5	22.4	9	1.94	7.35	221	110	110
	17	21.7	9	1.89	6.74	202	101	101
	16.5	21.1	9	1.83	6.16	185	92	92
	16	20.4	9	1.78	5.62	169	84	84
	15.5	19.8	9	1.72	5.11	153	77	77
	15	19.2	9	1.67	4.63	139	69	69
	14.5	18.5	9	1.61	4.18	125	63	63
	14	17.9	9	1.56	3.76	113	56	56
	13.5	17.2	9	1.50	3.38	101	51	51
	13	16.6	9	1.44	3.01	90	45	45
	12.5	16.0	9	1.39	2.68	80	40	40
	12	15.3	9	1.33	2.37	71	36	36
	11.5	14.7	9	1.28	2.09	63	31	31
	11	14.1	9	1.22	1.83	55	27	27
	10.5	13.4	9	1.17	1.59	48	24	24
	10	12.8	9	1.11	1.37	41	21	21
	9.5	12.1	9	1.06	1.19	35	18	18
3 year old child	9	11.5	9	1.00	1.00	30	15	15

GENERAL NOTES:

(a) All dimensions in inches (1 in. = 25.4 mm).

(b) This Table calculates the maximum removal effort that shall be required to remove the body blocking element from the cover/grate being tested as based on the width of the applicable body blocking element. Intermediate values may be calculated using the formula $(\text{width}/9)^3 \times 15$

Example: $10.7/9 = 1.188$; $1.188^3 = 1.68$; 1.68 multiplied by 15 = 25.2 lbf

Source: ASME A112.19.8 – 2007 page 14

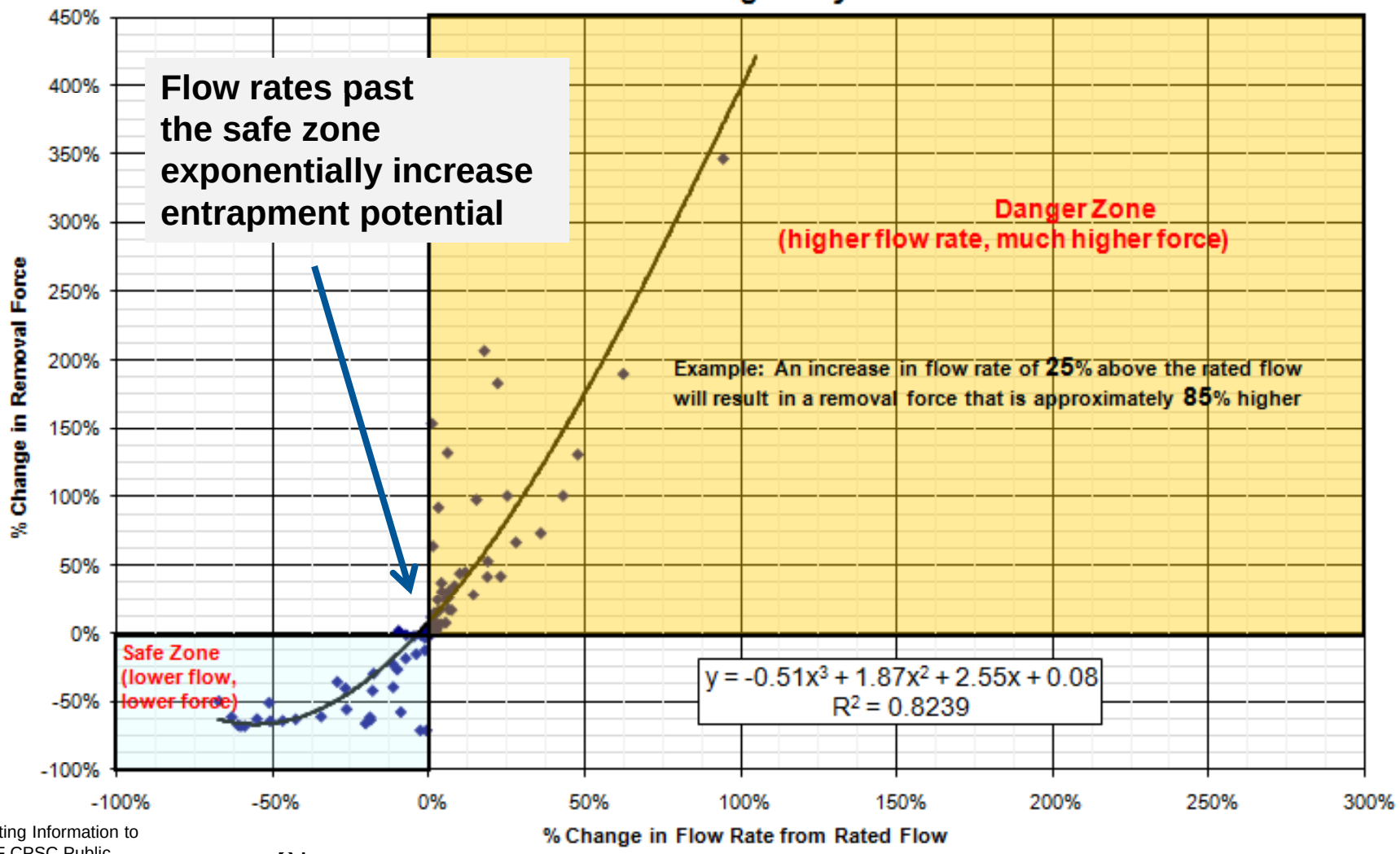
Questions

2. What is the potential impact of over-rating a pool and spa drain cover on public safety?

Flow rates past the safe zone increase entrapment potential exponentially

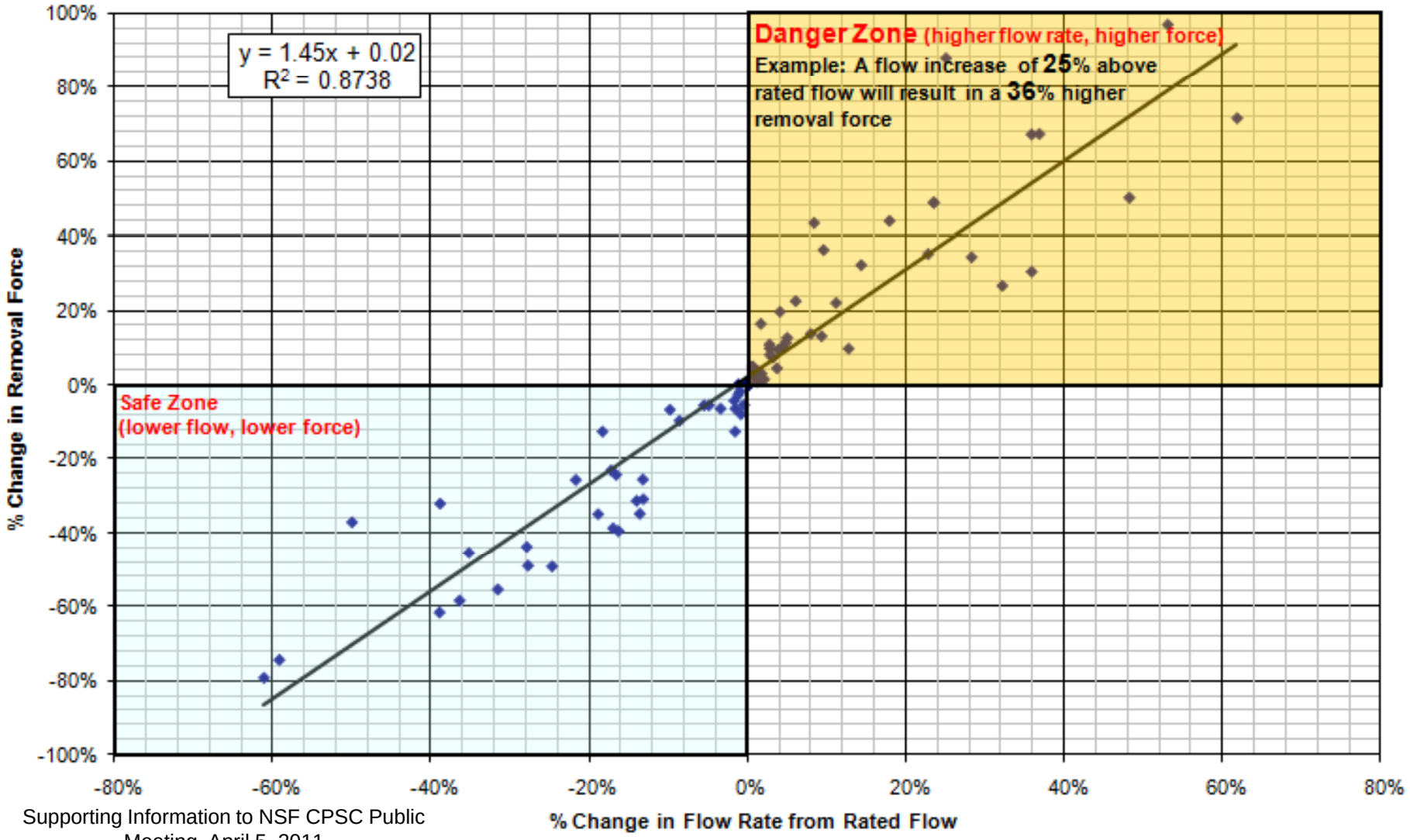
Effect of Changes in Flow Rate on Maximum Body Block Removal Force

Blockable Fittings Only



As flow rates increase – the removal force increases exponentially

Effect of Changes in Flow Rate on Body Block Removal Force
Unblockable Fittings Only



Questions

3. **What is an acceptable level of variance in flow ratings that would be in the interest of safety?**

Variances in Body Entrapment Testing

- **Variances in repeated tests of the same suction fitting at the same flow rate**
  - removal force variance of +/- 8%
- **Variances in testing same drain cover on different sumps**
  - can result in significant differences

Major Sources of Variation Body Block Test

1 - Use of a simulated pool floor
2 - Sump used

Body Block Test on an 8” cover using 2 different sumps	
Passing Flow Rate	Sump Used
48 Gallons per minute	1
<6 Gallons Per Minute	2

The main difference between the sumps is that sump 2 lowers the cover elevation by ~ 0.1 inches

NSF Certified Product Listing Example

Address http://www.nsf.org/Certified/Pools/Listings.asp?TradeName=&ProductType=ASME1908&PlantState=&PlantCountry=&PlantRegion=&su Go Links Convert

Facility : Ann Arbor, MI

Suction Fitting Model	Test Sump Model or Field Type	Orientation (Wall and/or Floor)	Design Flow Rate (GPM)
30" x 30" Suction Outlet Cover[1] [4] [5]			
ABC-123 Model	Field Fabricated-FG2	Floor	1432
XYZ-123 Model	Field Fabricated-FG2	Wall	1120
B-1000 Model	242424SSMD-AE-8	Floor	1432
A-1000 Model	242424SSMD-AE-8	Wall	1120
K-1000 Model	Reference Footnote [7]	Floor	1504

[1] Certified to ASME A112.19.8a-2008.
[2] Per ASME A112.19.8a-2008, the use of the suction fitting with a field fabricated sump built in accordance with Figure 2 of that standard shall be permitted when specified and designed by a Registered Design Professional. Installers should also ensure that the drain cover is installed, fastened and secured according to the drain cover and the sump manufacturer's instructions.
[3] This cover is approved for use over a field fabricated main drain sump that meets the requirements of the figure 2 in the ASME A112.19.8a-2008 Standard for Sunction Fittings, providing the sump is qualified by a Registered Design professional and installed per the manufacturer's instructions.
[4] NSF Listed units have a white cover.
[5] For single and multiple drain use.
[6] The sumps are stainless steel.
[7] Drain cover tested with a centrally located in floor 12 inch diameter pipe (No Sump). Testing qualifies use with 12 inch diameter pipe or smaller.

Questions

4. **What actions have been taken or are currently underway to resolve the issue of significant variance in pool and spa drain cover ratings and ensure this problem is resolved and does not occur again?**

NSF Suggestions

1. Encourage CPSC to clarify concerns and request interpretation from the Standard Technical Committee
2. Support third party consensus standard development process and timely adoption of successor standard APSP-16
3. Require all certifiers to include sump detail in their Certification Listings
4. Consider linking PoolSafely.gov to Certifier's website listings of drain covers
5. Clarify to certifier customers that unblockable drains are not part of this investigation
6. Encourage CPSC staff periodically visit test labs to help ensure consistency