

SurfCoaster Corporation

Sun/Surfcoaster Co.
Bubba Tub
Kiddie

SAFETY MANUAL

Revised 5-01-90

212 Crest Road, Cape May Court House, NJ 08210 (609)465-8000

SURF COASTER CORPORATION

SAFETY MANUAL

Surf Coaster is committed to the safe operation of all Water Slides, Sky Ponds, Splash Down Pools, and all other water oriented amusement equipment we manufacture.

As the owner of a Surf Coaster water flume ride, it is your responsibility to establish procedures that will ensure the safety of your guests and the efficient operation of your flumes. This manual outlines operation and maintenance procedures for Surf Coaster water flumes. It should be used by park management to develop a safety handbook and to train park personnel. We welcome your questions regarding this material and appreciate any additions you may have that are unique to your individual flume rides.

This Safety Manual has been written based on a compilation of material gathered from Surf Coaster installations since 1979. Due to the fact that the dynamics of water slides differ from manufacturer to manufacturer, the recommendations that follow are specifically for Surf Coaster Equipment.

SURF COASTER CORPORATION

SAFETY MANUAL

TABLE OF CONTENTS

| | | <u>Page</u> |
|-----|---|-------------|
| I | <u>INSPECTION AND MAINTENANCE OF SURF COASTER FLUMES</u> | 1 |
| | - DAILY | 1 |
| | - EVERY THREE MONTHS DURING THE FIRST YEAR OF OPERATION AND EVERY SIX MONTHS THEREAFTER | 3 |
| | - EVERY SIX MONTHS | 6 |
| | - SEASONALLY | 6 |
| II | <u>OPERATION & MAINTENANCE PROCEDURES FOR SURF COASTER FLUMES</u> | 7 |
| | - DISPATCH PROCEDURES | 8 |
| | - RULES AND REGULATIONS | 10 |
| | - WEIGHT RECOMMENDATIONS | 14 |
| III | <u>OPERATION OF FLUME RIDE WATER FLOW AND PROPER LEVEL OF WATER IN SPLASH POOL</u> | 15 |
| IV | <u>ACCIDENT PREVENTION</u> | 19 |
| | - ELECTRICAL FAILURE | 20 |
| | - BODILY COLLISIONS | 20 |
| | - STRUCTURAL COLLISIONS | 21 |
| | - SLIP & FALLS | 22 |
| V | <u>MAINTENANCE PROCEDURES</u> | 23 |

I INSPECTION & MAINTENANCE OF THE FLUME RIDE

Inspecting and maintaining the fiberglass flumes is essential to their safe operation. Surf Coaster suggests the following schedule for routine maintenance:

DAILY

1. Inspect splash-down pool floor and apron for debris before starting pumps.
2. Before starting water flow, a lifeguard should walk up each flume prior to opening in order to inspect for the following:
 - a. Foreign objects in the flume.
 - b. Check each joint to see if rubber gasketing is protruding and if so, cut it off.
 - c. Check to make sure no air pockets in the glass have broken open or appear at the edge of the joint (these create a razor-like edge and can cause injuries).

3. After starting water flow, another walk up the flume is recommended by the lifeguards, (unless it is a speed slide) in order to feel each flume juncture with his or her bare feet.
4. Once the lifeguard reaches the top of the slide he or she should ride the slide before allowing the public to ride.
5. The stairs, treads, pathways, and tower platforms must be inspected at the beginning of each day for possible splinters or nail heads that may have worked upward.
6. Lifeguards should be on duty at least 15 minutes before opening. A good manager will find many cleaning jobs that can be performed during this time period, such as: cleaning the bath tub ring that occurs at the exit and entry tub of each flume, and cleaning the outside of the splash guards and skirts.
7. Check for smoothness of lumber on pathway and stairway sections, as well as all handrail construction and make certain that all nails are properly driven into wood.

EVERY THREE MONTHS DURING THE FIRST YEAR OF OPERATION

AND EVERY SIX MONTHS THEREAFTER

1. Flume junctures should be checked for fairness and alignment. Some light sanding may be necessary due to a slight shifting of the junctures through riding movements, wind movement and differential earth settlement.
2. Inspect all trestles at the top of the footings to be sure that footing brackets are properly secured to trestle legs and anchor bolts have been secured to leveling pads (foundation caissons).
3. Check all tie rods in trestles to be sure that nuts and washers are properly tightened.
4. Check flume juncture attachment to trestle yoke.
5. Inspect all flume junctures for bolts, washers and lockwashers to see that they are properly assembled.

6. Check pathways and tower segments for proper tie down hardware.
7. Inspect joints in flumes and splashguards for tightness and for proper caulking.
8. Make sure all junctures are properly cut and cleaned, remove excess caulking and gasket material.
9. Walk entire flume and inspect all fiberglass gelcoat for possible chips or open air bubbles. Repair if necessary. All patches must be smooth.
10. Inspect all pathway and stairway sections as well as all handrail construction for tightness of nuts, bolts, and hardware.

11. The splash down pool should be examined for smoothness of plaster, paint and/or tile surface. Check level of fiberglass transition segment in pool. Inspect all fittings and grates to be certain they are secured properly and flush with surface finish of the pool.
12. Water flow adequacy should be constantly monitored.
13. The water chlorination should be kept at controlled levels as excess chlorine will cause eye irritation and possible respiratory problems. Excess chlorine will also stain the gelcoat. (This should be checked at least four times per day)
14. The proper level of water in the splash pool should be maintained at the same level as the mouth of the exit flume. Note: Water will spill and/or evaporate requiring constant regulation. This item is extremely important and should be constantly monitored.

EVERY SIX MONTHS

The gelcoat surface of the flumes and splash guards should be cleaned, waxed and buffed, similar to caring for a fiberglass boat or auto. After 3 or 4 years of operation a light compounding may be necessary to restore the original gelcoat luster.

SEASONALLY

Every procedure listed under section I, "Inspection & Maintenance," should be executed prior to opening each season.

IMPELLERS:

Every season before opening, check impellers for:

- collection of debris
- possible damage
- pitting

(See Page 15 For Operation Of Waterflow).

II OPERATION & MAINTENANCE PROCEDURES FOR FLUMES

In order to ensure the safety of park patrons, each guest must be properly dispatched from the starting tower. In addition, it is essential that guests be aware of the rules for sliding down safely and exiting immediately. This section will outline dispatch procedures and the necessary rules and regulations that owners must communicate to their guests.

CARNY TOWN.COM

DISPATCH PROCEDURES

1. The Surf Coaster Supervisors will advise the proper dispatch intervals for each of our flumes. It is suggested that the owners affix a mark, part way down the flume signaling the tower lifeguard when it is safe to dispatch another guest. Generally an 12 to 15 second interval between sliders is safe. Guests wearing nylon bathing trunks will slide faster than those wearing cloth trunks. In addition, the weight of each guest should be considered, as heavier guests will travel faster than small children.

2. There should be attendants located in three areas on each slide. The positions are as follows:
 - a. A dispatcher at every entry pool on the starting tower.

 - b. Two lifeguards, one certified, should be at the splash pool encouraging guests to exit quickly. It may be necessary for the lifeguards to be in the splash pool assisting people out of the water.

3. Dispatch on straight speed slides should occur only after the runway is free of any guests or obstruction. At no time should anyone be dispatched on a speed slide until the previous guest has cleared the runway path and is in a position of safety.
4. The lifeguard stationed at the dispatch point of any flume must remain in continual visual or verbal contact through the use of radios with the lifeguard stationed in the splash pool.

RULES AND REGULATIONS TO GUESTS

1. Guests should ride all flumes in a feet-first position, laying on their backs. Legs should be kept closed, side by side. Hands should be clasped behind their heads, elbows pointed up.

On Speed Slides, the position described above applies, except that legs should be closed with feet crossed at the ankles. This is to prevent guests from opening their legs on landing.

The only exception to the above is when specific instructions are given for riding a Surf Coaster approved vehicle.

The following statement has been taken from an article entitled, "Place Restrictions On Who Can Ride " by Carol Lee Fick of Ellis & Associates, the most respected company in the world for water safety procedures,

"Although many parks and ride operators restrict who can ride an amusement device based on the patrons young age and height, more attention should be focused on a patrons age, size, sobriety, demeanor, dexterity and coordination".

We feel that special attention should be paid to taller and heavier riders. Individuals who are heavy and unfit, ride faster in the flume and land harder in the pool. Accident reports indicate that they injure themselves more frequently than children and average build individuals.

2. The following rules and regulations should be enforced by the park owner. It is suggested that guests be informed of these rules by way of signs with both a written and pictorial message. Pre-recorded messages played on audio-tape through the loud speakers has been very effective in communicating rules and regulations to guests on the walkways and starting tower.

- a. No diving
- b. No flips
- c. No stunts
- d. No chain rides, including individuals linked together or tubes linked together (unless Surf Coaster approved).
- e. No standing in flume
- f. No kneeling
- g. No running upstairs
- h. No throwing of objects off slide towers
- i. No riding with small children in laps except when approved by Surf Coaster
- j. Children under 42" in height should not ride
- k. No stopping in flumes
- l. No changing body positions in the flume

?

- m. Guests must exit splash pools immediately
- n. No jumping
- o. No expectant mothers
- p. No nursing mothers
- q. No heart patients
- r. No guests with back, neck, muscular, or skeletal infirmities
- s. No guests who are excessively overweight

3. Those riding raft rides should ride as follows:

- (a) Rear rider should look over right or left shoulder of front rider, not at the back of the head of front rider to avoid possible impact when entering splash pool.
- (b) Riders should hold on to handles until raft comes to a complete stop.
- (c) Riders must sit in center cavity and not on edge of tube
- (d) Park operators have reported to us that the addition of a foam landing flap as an interface between the flume terminus and the splash down pool has reduced landing impact.

4. Weight Recommendations:

(a) Body Flumes

- 1) Surf Coaster water flumes are not recommended for individual men and women who are excessively overweight.

(b) Single Tubes

- 1) Surf Coaster water flumes are not recommended for individual men and women who are excessively overweight.

(c) Two Person Rafts

- 1) We recommend a maximum of 400 lbs. combined total weight.
- 2) The heavier person should sit in the rear.

NOTE: Please make sure single tubes and double tubes are inflated to manufacturer's specifications. Some operators have reported less roll over with a 48" tube as opposed to a 42" tube.

III OPERATION OF FLUME RIDE WATER FLOW

It is imperative that the proper water flow be maintained in the flumes. The optimum water flow is established by a Surf Coaster representative by regulating the tub inlet valve. DO NOT change this flow set or the flume may become dangerously slippery. Please adhere to the following:

- a. The tub inlet valve should be permanently marked at the optimum flow point.
- b. These valves should be checked periodically or mechanically held in this position by locking devices.
- c. If any one tub valve is closed temporarily for repairs to flume or for other reasons, the active tubs will show an increase in flow if they are on the same manifold. Active tub should be throttled back to their usual flow.

d. Check impellers before each season for:

- collection of debris

- possible damage

- pitting - impellers age over time and develop a pitted surface with air holes. These air holes can significantly reduce water flow. Water flow has a breaking action and slows the rider down. The absence of water flow makes the slide extremely fast and dangerous.

We suggest the following warning sign be posted outside after hours and at the entry pools when a flume is closed:

**WARNING: DO NOT RIDE THIS SLIDE WITHOUT WATER FLOW -
EXTREMELY DANGEROUS!**

Note: There is a potential for severe injury if slides are ridden without water flow after hours. Wetness on the flumes due to a rain storm and/or damp air make them very slippery and dangerous. This type surface could lead to someone flying out of the flume.

ESTABLISHING AND MAINTAINING THE PROPER LEVEL OF WATER IN
SPLASH POOL

On all Surf Coaster waterslides, with the exception of the Shotgun Slide, the water must be maintained at the same level as the mouth of the exit flume. This water level should be monitored very closely, particularly during peak hours, as the water level will decrease due to rider carry out and evaporation.

FAILURE TO MONITOR THE WATER LEVEL FACTOR MAY PRESENT A HAZARD TO GUESTS ENTERING A POOL THAT IS TOO SHALLOW. IT ALSO PRESENTS A DROPPING ACTION WHICH DIRECTS THE RIDER'S FEET TO THE BOTTOM CAUSING INJURY RATHER THAN A SKIMMING ACTION ACROSS THE POOL AS DESIGNED.

Note: We have discovered through accident reports that most waterslide accidents occur in the pools. Two situations cause this:

- 1) Inadequate water level in the pool.

This condition prevents proper safe skimming action.

- 2) No foam pad on the bottom. Surf Coaster Corp. insists that all splash pools be equipped with a sponge rubber mat to prevent injuries, 1" thickness minimum. Do not operate the flumes without this. (In most instances, the pad is what lessens the injury if the water is not properly maintained at the mouth of the exit flume)

Pool depth is based on an optimum depth that will allow a rider of average height and weight to splash down safely. The pool must be shallow enough so that little children, 42" can exit walking on their toes. By increasing pool depth, we slow down egress and dispatch because children cannot get out of the way, and also present a possible drowning situation. Therefore, it is imperative that the water level be maintained to promote the desired skimming action for adults and children.

IV ACCIDENT PREVENTION

Accident prevention is our goal as designers and suppliers of Surf Coaster flume rides. We want to assist owner/operators of Surf Coaster flume rides in achieving the same goal. All staff members must be educated as to the hazards present within the flume, on tower walkways, in the entry and splash down pools. The following chart provides a description of the types of injuries that occur, where they occur and how to prevent accidents from happening. Please use this tool in training your staff how to maintain a safe Water Park.

| HAZARD | INJURY TYPE | LOCATION WHERE INJURY OCCURS | HOW TO CONTROL ACCIDENT |
|---|---|--|---|
| Electrical failure causes pump to stop; | Bodily/structural collisions may cause various injuries | A decrease in water flow in flume makes flume extremely slippery and dangerous. This promotes oscillation and could lead to someone flying out of the flume. | Water flow must be super constantly. If water flow decreases stops, STOP THE SLIDE FR OPERATION IMMEDIATELY. |
| Drowning; | Drowning | At intake pump. Inlet. | Proper screening of intake pumps must be separately housed or far enough away from slides with proper protection to deter patrons. Attendants at splash pools must be aggressive and continuously talk or move people out of the pool. Lifeguards at the splash should be alert to a child who has possibly swallowed water during slide down, or at the inlet point of the pool. |
| Bodily Collisions; | Concussions, dislocations, fractures, punctures, joint inflammation, broken teeth back injuries | Entry pool and in the flume. | RIDER ENTRY RATE CONTROL: Attendant must regulate based on conditions in flume, rider's weight and clothing material worn. The time interval is 12 seconds between sliders. A small child may follow adult in a matter of 8 seconds because the lighter person will go faster than a heavier person. A larger person must be back longer than the average interval so that they do not catch up to the lighter person. Where mats are used, the mat will slow the rider requiring the entry to be delayed. Riders wearing nylon backsuits will travel faster than those wearing cotton suits. No multiple rider entry unless using approved |

CARNY TOWN.COM

CARNY TOWN.COM

| HAZARD | INJURY TYPE | LOCATION INJURY OCCURS | HOW TO CONTROL ACCIDENT |
|---|--|--|---|
| <p>Structural collisions including impact upon landing or finish of ride</p> | <p>Abrasions, lacerations, dislocations, broken teeth, fractures, back injuries</p> | <p>Within the flume structure and in the splash pool</p> | <p>Joints should be smooth. All sharp edges removed. Individuals land in random physical configurations into the splash pool. They are exposed to impact with the landing pool bottom and/or unusual entrance into the water surface. Sometimes after entering the splash pool, riders become disoriented and start walking back toward the slide. The lifeguards should have a whistle around their necks for an immediate signal to grasp the attention of people in trouble. All landing pools should be equipped with rubber mats a minimum of 1" thick. DO NOT OPERATE WITHOUT A MAT. We suggest mats manufactured by: GROENDYKE NEG. COMPANY PO BOX 278 BUCHANAN, VA 24066 PHONE: 703-254-1010</p> |
| <p>Water level too low presents a hazard to guests entering a pool that is too shallow. Guests will drop into pool rather than skimming across a designed splashpool.</p> | <p>Back injury Leg injury Hip injury Ankle injury</p> | <p>Splashpool</p> | <p>Water level in splashpool must be maintained at the same level as the mouth of the exit flume. Landing Flaps have been used by Owner/Operators and smooth out the exit.</p> |

| HAZARD | INJURY TYPE | LOCATION WHERE INJURY OCCURS | HOW TO CONTROL ACCIDENT |
|-------------|---|---|---|
| Slip & Fall | Fracture, sprains, concussions, cuts, lacerations | <p>Surfaces, whether in water or on walkway</p> <p>Exit area of splash down pool walkway and stairs</p> <p>Entry pool</p> <p>Area under flume where water splashes out</p> <p>Mats getting left around splash pool present a slip and fall hazard</p> | <p>Attendants must monitor horseplay, running, pushing.</p> <p>Walkways and stairways should not be roped off in an area to redirect traffic as guests have been known to grab rope to prevent themselves from falling.</p> <p>Slip resistant surfaces should be installed on exit ramps and steps.</p> <p>Hand rails MUST be installed on exit steps to prevent slipping.</p> <p>No running into entry pool.</p> <p>Trained attendants must be present at entry and exit.</p> <p>Monitor water flow and prevent leakage with regular maintenance.</p> <p>An attendant responsible for mat storage and control should be established.</p> |

ANYTOWN.COM

MAINTENANCE PROCEDURES

A. Maintenance of the Surf Coaster flume ride should be a checking of the fifteen items listed in the inspection report.

1. Items pertaining to flumes should be checked monthly in addition to the lifeguard walk-up procedure each morning.
2. Items pertaining to trestles and hardware should be checked every three months the first year and every six months thereafter.
3. The gelcoat surface of the flumes and splash guards should be cleaned, waxed, and buffed every six months, similar to taking care of a fiberglass boat or auto.

4. After three or four years of operation, a light compounding may be necessary to restore the original gelcoat luster.
5. The water chlorination should be kept at controlled levels as excess chlorine will fade the gelcoat.
6. Flume junctures should be checked for fairness and alignment every three months during the first year and every six months thereafter. Some light sanding may be necessary due to a slight shifting of the junctures through riding movements, wind movement or differential earth settlement.

CONCLUSION

Our goal in publishing this manual is to assist you in establishing procedures that prevent accidents. It is our obligation as suppliers to warn operators of any dangers that we have discovered or that we suspect could result in an accident. We feel that as an operator, you have a similar obligation of alerting Surf Coaster immediately of accidents if they occur, and also to notify us if you suspect a potential accident. Water Parks have become safer over the past few years. By continued cooperation, we can make them virtually accident free.

This manual is a compilation of information we have gathered since Surf Coaster's inception in 1979. It is a summation of our company's research and our customer's input over the past several years.

Changes in this manual will be made by addendum as the need warrants. Please keep us informed of any problems or changes that should be implemented.

Thank you for selecting Surf Coaster's products. We are proud to be a part of this exciting and expanding industry that promotes family fun and fitness.