

Redesigning 'Finding Nemo - The Musical'

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By Lauren Salisbury

Marlin the clownfish is a safety enthusiast. After losing nearly all his family to a vicious barracuda, the overprotective dad does his best to keep his remaining son safe from the ocean's dangers in 2003's Academy Award-winning film "Finding Nemo."

After an epic journey through the "big blue world" to rescue Nemo, Marlin learns the best way to protect your loved ones is by giving them the tools and education to stay safe.

At "Finding Nemo – The Musical," a Broadway-style stage show at Disney's Animal Kingdom Theme Park, Cast Members have taken Marlin's philosophy to heart. With an ergonomic redesign of the show and an infusion of best practices, the team has been able to reduce incidents by 70 percent in one year.



Marlin's safety attitude has rubbed off on the Cast of "Finding Nemo – The Musical" at Disney's Animal Kingdom Theme Park.

Nemo and friends were brought to life for the park show in 2007 by Michael Curry Design, a veteran puppetry firm whose portfolio includes "Disney's The Lion King" on Broadway and "Disney's Aladdin: A Musical Spectacular" at Disney California Adventure Park. Advancements in ergonomics united the puppet builders and a group of Walt Disney World safety experts to reexamine the creative production.

To make the characters' eyes and mouth move, puppeteers squeeze a handle resembling a brake lever on a bicycle, a movement repeated thousands of times each show by performers in the principal roles of Marlin, Dory and Nemo. When first designed, the handle's distance was beyond a comfortable range for most performers.



After examining hand measurement data, the team installed new levers with a decreased handle width. The result is a more comfortable and safe experience, and fewer hand injuries such as carpal tunnel syndrome.



Bill Sheppard presents a lighter, ergonomically friendly Nemo puppet.

Because male and female performers typically have different body measurements, puppets were adjusted to reflect those differences. Dory primarily is played by a female performer, so the puppet's top lever and handle were redesigned to better fit a woman's grip. The handle also was extended to rest comfortably in the performer's hand without much effort.

For the comfort and safety of all performers, most puppets also were redesigned to be lighter.

"When you hold something for [the length of the show], even just a pound in reduction makes a huge difference," said Susan Shultz, an Entertainment technician who has been part of the production since opening day. "It's been amazing to see the work that has been done on the puppets. We tested every puppet for improvements."



Susan Shultz compares the new Dory handle, left, to the old version.

In addition to modifying the colorful puppets, the team also applied ergonomics to the show's choreography. The Safety team made suggestions on moments where performers could incorporate better practices such as using two hands instead of one, and Safety in Motion techniques.



By adjusting the show's choreography, puppeteers' wrists now stay in the green zone.

A key principle of ergonomics is to avoid repetitive motions to reduce the risk of injury. Now, each of the show's 18 performers and 15 technicians is cross-trained on four to five roles to vary the muscles used.

"This has been a big success," said Bill Sheppard, area manager. "Having multiple roles is very helpful for our performers and technicians so they aren't using the same muscles every day. This also keeps people mentally in the game," he added.

The safety success at "Finding Nemo –The Musical" will contribute to future designs in the puppetry industry, according to Susan.

"Nothing like this had ever been done," she said. "These are unique puppet designs and they are going to help with other productions outside the company."