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## ***Death Race*: Killer VFX for a Killer Ride**

J. Paul Peszko puts readers behind the driver's seat to learn more about the visual effects production on *Death Race*.

Based on the 1975 film, *Death Race 2000*, Paul W.S. Anderson's remake, *Death Race* (opening today from Universal), takes place on Terminal Island: a futuristic prison island where inmates are forced to brutalize and kill one another in road races.

Now that is certainly one way to reduce prison overcrowding, which is exactly what the Weyland Corp. intends to do -- and make a lot of money doing it by televising this death sport to a global audience thirsting for violence. Imagine NASCAR with heavily armored vehicles firing at one another.

"Get ready for a killer ride" is the tag line, and they weren't kidding.

Even though vfx were meant to enhance the story and not overwhelm it, a film such as this is very much indebted to its effects. If they fail, so does the film. If the vfx look in any way phony or unrealistic, the story becomes laughable.

Two vfx firms were hired specifically to bring a strong sense of photorealism to this futuristic action film. Both Mr. X, the primary visual effects studio, and Rodeo FX are located in Canada, where *Death Race* was filmed.

"We shot the film in Montreal and we didn't have obviously an island completely surrounded by water that would have the feel that director was looking for," explained Mr. X Visual Effects Supervisor Dennis Berardi. "Anytime you have a wide establishing shot of an island, it's generally a digital shot, an all CG shot. So, in those shots we were doing full-on water simulation, full-on environment, a photorealistic environment for the island itself and all the supporting elements, including skies and cars, where you'd make up the cars off the race track."



Chaos reigns in the world of visual effects for *Death Race*. All images © Universal Pictures. Images Courtesy of Mr. X.



Many of the practical effects were augmented with CG elements such as missiles and smoke.

According to Berardi, "The overall scope of the work was 820 shots, believe it or not... We did a lot of greenscreen compositing work, where the actors were on a sound stage in cars on these hydraulic rigs that shook them around a bit. We would composite the outside world, the world outside the car windows. This was for the close up action on the actors where they had dialogue. We had probably over 400 greenscreen effects and composites."

Because of the violent nature of the story, the actual racing and stunt work entailed a heavy use of vfx as well. "We had a lot of racing enhancements which were for the actual practical racing. We were adding missiles and stuff. It's called *Death Race*, and a lot of the cars are fully armored and fitted with tactical weapons. So, anytime any of the cars had to physically fire a missile or rocket or RPG -- rapid gunfire, it was done digitally as well. To real cars we were adding firing flashes, strafing and stuff like that. We had stunts, digital stunts. The methodology of the film was to shoot as much practical stunt work as possible. But some of the stunts were so spectacular we actually went digital with some of the big crashes."

But Berardi didn't consider the racing and stunt work the most challenging aspect of his work on *Death Race*.

"Either of the Terminal Island's wide establishments [were the most challenging]. The island is basically a mile long, and there's a bridge that's a mile long that connects it to the mainland and this hellish landscape. Getting that geography right and getting the scale correct and making the water and the island look believable in terms of photorealism and water performance were the most difficult things we did on this film. We used Houdini for water simulation, and it ultimately got rendered in RenderMan."



The mandate on the digital effects was to keep them as photoreal as possible.

And what specific goal in mind did the director have as far as the overall look and feel that he wanted?

"He had few movie references that he kept pointing us to. One was *Black Hawk Down* in terms of the gritty, dirty look. Very high-contrast, a sort of de-saturated look, a lot of chaos in the frames. With the races at track level we took a lot of inspiration from that movie. He didn't want it to be picturesque or pretty. He wanted stuff to be realistic and contrasty and dirty. I think we achieved that. It feels like you're 30 or 40 years in the future in a world gone wrong, and society has deteriorated. That was kind of like the feel he was going for."

Considering the fast-paced action, the incredible stunt work and weaponry firing every which way, the film had to require a well-coordinated pre-visualization effort if it was to succeed.

"First of all, Scott Kevan, the director of photography, Paul Austerberry, the production designer, myself and Paul Anderson, did a bunch of tests," Berardi continued. "We shot camera tests, from the art direction to the lighting to the visual effects. It was a unified field, where we had everyone on the same page. So, I think we came up with a very strong creative collaboration where no one was working against each other. We all knew what the look was right down to the last moment in post-production. I think we were all engaged creatively."

"We pre-visualized every major stunt in the film with photographically accurate lenses in real-world scale. We modeled each of the hero cars to scale obviously and pre-visualized every single one of the major stunts. We did that weeks before principal photography."

"We had meeting after meeting after meeting where the previs served as a communication tool for Paul (Anderson) and the crew and the stunt drivers to understand what the action needed to be.



The show also featured environment work for Mr. X, including this completely CG shot of Terminal Island.

"It was a pretty heavily pre-visualized show including one of the most spectacular stunts in the film – the *Dreadnought Death*, where Jensen, the Jason Stratham character, and (Machine Gun) Joe, the Tyrese Gibson character, conspire to destroy the *Dreadnought*, this 18-wheel armored vehicle with huge guns." Berardi then outlined the pipeline they have established at Mr. X.

"Our pipeline is basically set up where we model, rig, UV and animate in Maya and do shader work and lighting in Houdini. We ultimately render in RenderMan. We do naturalistic effects like fire, smoke, water, debris in Houdini."

But the shining star of this movie, according to Berardi, was Nuke.

"On a show like this, where you're delivering over 60 minutes (of vfx) in the film, one of the things that helped us was that the show was completely composited in Nuke. We recently switched over from Shake to Nuke. The speed and the 3D compatibility that Nuke has was just unbelievable. It was a total paradigm shift in our workflow in terms of moving to Nuke."

One firm that did not switch from Shake to Nuke was Rodeo FX. Granted, they did more or less secondary VFX work on this film and did not have the huge amount of shots to produce as Mr. X nor were they involved in any pre-visualization work.

"Rodeo FX shot work included a large volume of greenscreen driving shots, complex wire removal, plate fixes and background matte painting/plate reconstruction," stated Visual Effects Supervisor Sebastien Moreau. "Our company's focus is matte painting and compositing, so this body of work was a perfect fit for us."

Like Mr. X, Rodeo FX got involved in the effects for some of the violent race action and the heavy gunfire and strafing.

"The film is super exciting and action packed with these fast-paced and explosive filled car races, so we also did a lot of element addition to enhance bullet hits, sparks and other events to enhance the action."

They produced environmental effects as well.

"The film was shot on an island in Montreal, but in order to sell the remote prison location, there was a lot of city removal and replacement, and water extension to sell the geography."

"There was a lot of work on integrating practical effects and CG effects," Moreau explained. "Additionally because of the dynamic, fast-paced nature of the film, there are some great camera moves in many of the shots. This made some of the paint work a bit more challenging."

Like Berardi and Nuke, Moreau had a product recommendation as well.



In this shot, Mr. X added a CG car (screen left) and reconstructed the track removing cars for the original shoot.

"For the challenging paint job, there's nothing like the Flame," he proclaimed. "It is still the best in my opinion."

Moreau outlined their overall goal as far as the look they were trying to achieve with the effects they produced and integrating them with live action.

"The key to our work on *Death Race* was realistic effects and impact," Moreau stated. The film is so fast-paced, high energy, and the effects needed to complement that. We aimed for clean, exciting effects.

"There is also a unique shooting style to the film, which adds a lot of the impact, so an important part of our work was considering the context of our effects and making them exciting and impactful, but not overwhelming - to let the story and camera work dominate."

As far as the pipeline at Rodeo FX is concerned, Moreau had a different take on compositing than Berardi.

"The majority of our work on *Death Race* was compositing, and most of this was done on the Flame. The speed and capability of the new Flame Linux was a perfect fit, allowing us to get through a large volume of shots quickly. The other part of the compositing work was done on Shake."

While *Death Race* is far from anything NASCAR currently has going, the vfx heightened action should be enough to tear even the most avid racing fan away from widescreen ESPN HD for a couple of hours and into a theater.

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