Jet Edge news
WATERJET SYSTEMS

Waterjet Technology Helps BP Cap Gulf Oil Leak

Jet Edge and Chukar Waterjet Team up to Develop Water Jet System That Operates in Water Depths Exceeding 5,000 Feet

Jet Edge, Inc. and Chukar Waterjet, Inc. recently played a key role in helping BP stop the oil leak in the Gulf of Mexico. The companies provided ultra-high pressure waterjet equipment and application expertise to blast away hydrate ice crystals that had formed inside a containment cap at the spill site, clogging the containment system.

Jet Edge custom engineered a 36,000 psi waterjet intensifier pump that was dropped 5,000 feet into the Gulf to power a robot-operated waterjetting lance that blasted away the hydrates. To ensure the hydrate remediation project's success, Jet Edge utilized advanced filtration and ultra-high pressure seal technology capable of withstanding the harsh undersea environment. The system was designed to blast with sea water or liquid gas.

As a result, Jet Edge developed the first-known waterjet system capable of operating in water depths in excess of 5,000 feet, opening a new frontier for waterjet technology.

Chukar Waterjet provided onsite applications engineering services throughout the project, working with a subsea technology company, an offshore logistics and supply company, an offshore transportation company, BP, and an independent safety group to ensure successful completion of the project.

For more information about Jet Edge water jet systems, visit www.jetedge.com or call 1-800-JET-EDGE (538-3343).

For more information about Chukar Waterjet, visit www.chukarwaterjet.com, or call 1-888-497-8749 or (763) 497-8749

About Jet Edge
Established in 1984, Jet Edge is a global designer and manufacturer of waterjet systems for precision cutting, surface preparation and coating removal. Jet Edge systems are used around the world in a broad range of industries, from the world's leading airlines to automotive, aerospace, industrial manufacturers, machine and job shops.

About Chukar Waterjet
Chukar Waterjet is a leader in application and rental of ultra-high pressure (UHP) waterjet mobile equipment, and provides prompt, high-quality waterjet fabrication services and cleaning applications. Chukar Waterjet also is a supplier of high quality parts for waterjet cutting and cleaning equipment, offering a complete line of waterjet replacement parts.

cont.

In This Issue


ALLEN
DISCOVERER ENTERPRISE

WJTA-IMCA EXPO
AUG. 17-19, 2010
GEORGE R. BROWN CONVENTION CENTER
HOUSTON, TX
MORE INFO: WWW.WJTA.ORG

Mid Rail Gantry Waterjet System

2010 WJTA-IMCA Expo

Visit Jet Edge at WJTA-IMCA Expo
Live Precision Waterjet Cutting Demos!

Aug. 17-19, 2010
George R. Brown Convention Center, Houston, TX
Booth 637

On Display:

Mid Rail Gantry Waterjet System
Available in a wide variety of sizes, 5'x5' to 21'x13'
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+/- 0.001" repeatability (bi-directional)
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Motion system separated from tank, eliminating vibration and ensuring maximum part quality
Motion components protected by metal covers with brush seals

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75KSI continuous operating pressure
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Reduces operating costs up to 50%

xP90-100 Intensifier Pump

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WJTA-IMCA EXPO
WATERJET BOOTCAMP

Jet Edge Presents…

Waterjet 101 – The Benefits and Capabilities of Precision Waterjet Cutting
9:30 a.m., Thursday, Aug. 19
WJTA-IMCA Expo
George R. Brown Convention Center
Houston, TX

Jet Edge Regional Manager Bradley Schwartz will provide an overview of the waterjet cutting system, and will discuss the numerous benefits of waterjet cutting, including its ability to cut virtually any material, eliminate secondary finishing operations and reduce part machining time. Brad also will discuss the benefits of waterjet cutting technology versus other cutting technologies, including laser, plasma and wire EDM. His comparison will address cutting capabilities, capital investment costs and operating costs. This 101-level presentation is designed for those who are new to waterjet and those who are considering adding waterjet to their capabilities.

About the Presenter

Bradley Schwartz is a waterjet industry veteran with more than 20 years of experience. He is well respected in the industry for his applications, programming and engineering expertise. He is Jet Edge's Pacific regional manager, based in Seattle, Wash.

Brad Schwartz (left) pictured with Jet Edge president Jude Lague

Jet Edge congratulates David Reutimann and Michael Waltrip Racing on their July 10 victory at Chicagoland Speedway!

Michael Waltrip Racing uses a 90,000 psi Jet Edge waterjet cutting system to cut more than 500 parts for each of its racecars.

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Jet Edge news
WATERJET SYSTEMS

Introducing… 5 Axis Precision Cutting Systems

Through our R&D partnership with Tecnocut S.p.a., Jet Edge is now offering 5-axis cutting systems featuring the Intelligent Kerf Compensation (IKC) technology.

For detailed product specifications, please visit www.jetedge.com.

IKC 5 Axis Cutting Head

Available on select Jet Edge 5 axis water jet cutting systems, the innovative IKC 5 Axis water jet cutting head is capable of making inclined cuts and controlling kerf to ensure optimal part quality. The IKC's capabilities include 600º rotation, a maximum angle of +/- 60º, and dynamic precision from +/-0.2 to +/-0.5 mm/m, depending on the tilt of head.

See video

Milestone

The Milestone is available in three sizes, 5.5'x6.5' nominal (1700 mm x 2000 mm), 5.5'x13' nominal (1700 mm x 4000 mm) and 6.5'x13' nominal (2000 mm x 4000 mm). It features the innovative IKC 5 Axis water jet cutting head, which is capable of making inclined cuts and controlling kerf to ensure optimal part quality. The IKC's capabilities include 600º rotation, a maximum angle of +/- 60º, and dynamic precision from +/-0.2 to +/-0.5 mm/m, depending on the tilt of head.

The Milestone's high-precision ground rack and pinion X and Y axes and ball-screw-driven 5.9" (150 mm) Z axis, make it one of the most accurate waterjet systems available. It maintains a cutting tolerance +/- 0.004" (0,1 mm/m) and repeatability accuracy tolerance of +/- 0.001" (0,025 mm) and supports a contouring and rapid feed rate of 0-1575 ipm (0-40000 mm/min.) Motion components are protected by steel covers with labyrinth lip seals to ensure lasting performance.

The Milestone is equipped with programmable contact height sensing and comes standard with one 5 axis cutting head; a second 5 axis or 3 axis cutting head can be added. Its many options include a rotating axis for pipe cutting, fire jet etching system, a drill and twin shuttles. Free software updates are included for the life of the machine. The Milestone's monolithic design expedites installation and makes it easy to relocate if necessary. The machine can support material up to 2,200 lbs/10.8 sf (1000 kg/mq). Its rigid fixed upright bridge structure can be moved out of the way for forklift or crane loading.

Idro line

The Idro line is available in three sizes, 5.5'x6.5' nominal (1700 mm x 2000 mm), 5.5'x13' nominal (1700 mm x 4000 mm) and 6.5'x13' nominal (2000 mm x 4000 mm. It features the innovative IKC 5 Axis water jet cutting head, which is capable of making inclined cuts and controlling kerf to ensure optimal part quality. The IKC's capabilities include 600° rotation, a maximum angle of +/- 60°, and dynamic precision from +/-0.2 to +/-0.5 mm/m, depending on the tilt of head.

The Idro line's high-precision ground rack and pinion X and Y axes and ball-screw-driven 5.9" (150 mm) Z axis make it one of the most accurate waterjet systems available. It maintains a cutting tolerance +/- 0.004" (0,1 mm/m), and repeatability accuracy tolerance of +/- 0.001" (0,025 mm) and supports a contouring and rapid feed rate of 0-1575 ipm (0-40000 mm/min.)
Motion components are protected by steel covers with labyrinth lip seals to ensure lasting performance.

The Idro line is equipped with programmable contact height sensing and comes standard with one 5 axis cutting head; a second 5 axis or 3 axis cutting head can be added. Other standard features include a stainless steel tank, automatic safety guards with clear windows on front and back, and a dredge conveyor for abrasive removal. Its many options include a rotating axis for pipe cutting, fire jet etching system, a drill and twin shuttles. Free software updates are included for the life of the machine. The Idro line's monolithic design expedites installation and makes it easy to relocate if necessary. Its rigid fixed upright bridge structure can be moved out of the way for forklift or crane loading.

Idea

The Idea large-format 5-axis system is available in sizes ranging from 13'x10' nominal (4000 mm x 3000 mm) to 39'x10' nominal (12000 mm x 3000 mm). It features the innovative IKC 5 Axis water jet cutting head, which is capable of making inclined cuts and controlling kerf to ensure optimal part quality. The IKC's capabilities include 600° rotation, a maximum angle of +/- 60°, and dynamic precision from +/-0.2 to +/-0.5 mm/m, depending on the tilt of head.

The Idea's high-precision ground rack and pinion X axis and ball-screw-driven Y and 7.9" (200 mm) Z axes, make it one of the most accurate waterjet systems available. It maintains a cutting tolerance +/- 0.004" (0,1 mm/m) and repeatability accuracy tolerance of +/- 0.001" (0,025 mm) and supports a contouring and rapid feed rate of 787 ipm (0-20000 mm/min.) Motion components are protected by steel covers with labyrinth lip seals to ensure lasting performance.

The Idea is equipped with programmable contact height sensing and comes standard with one 5 axis cutting head; a second 5 axis or 3 axis cutting head can be added. Its many options include up three additional bridges to support up to six cutting heads, a rotating axis for pipe cutting, fire jet etching system, and a drill. Free software updates are included for the life of the machine.

Water Jet Contractor AK Services Faces Nation's Toughest Water Jet Challenges Head On

If one word could describe the amazing water jet feats accomplished by water jet contractor AK Services, it would be "MONUMENTAL," and the all caps are no exaggeration.

Known coast-to-coast for its can-do reputation, this Boston-area contractor has completed some of the nation's toughest and most historically and environmentally significant water jet surface preparation and mobile cutting projects. Its impressive resume includes removing radioactive concrete from an infamous Hanford Site nuclear waste basin just 400 yards from the Columbia River in Washington state, repairing the Queen Elizabeth 2's (QE2) damaged hull after she ran aground near Martha's Vineyard, and rehabbing the leftfield seating steps at Boston's historic Fenway Park.

AK Services' other water jetting feats include cutting 3,500 lineal feet of steel during a bridge construction project in California, waterjetting 90 percent of the road surface on Boston's Central Artery, and removing PCB-contaminated caulk from a pumping station situated directly over the city's drinking water supply.

Cutting a door sheet in a petroleum tank. Waterjet is commonly used for this application because it cuts without flames or heat. Photo courtesy AK Services

AK Services entered the ultra-high pressure water jet industry in 1992, a spinoff of the former Aqua Kleen which specialized in using high-pressure water to clean Navy vessel oil tanks during the Navy's 70s-era conversion from black oil fuel systems to cleaner distillate fuel systems.

AK Services first ultra-high pressure project involved blasting away 20,000 square feet of lead paint from a Coast Guard vessel's engine room and bilge while another crew simultaneously removed the ship's engines for replacement. The project involved removing every speck of paint from tiny nooks and crannies and working in extremely confined spaces among numerous pipes and other obstacles.

AK Services President Patrick Canonica recalled how he immediately ordered his first Cummins diesel-powered Jet Edge ultra-high pressure water jet intensifier pump after winning the Coast Guard bid because water jet was the only way to safely remove the lead paint with the engine crew present.

"Had they sandblasted it, they would have had to shut it down and cocoon it and create a hazardous work area," Canonica said. "With water jet, the big advantage is you don't have to provide containment because it puts the lead into an aqueous state."

Continued...

By the end of the lead abatement project, AK Services had three Jet Edge diesel-powered water jet intensifier pumps, and has since amassed an armada of water jet pumps and water jet cutting, surface preparation and hydro lasing systems that includes 12 Jet Edge intensifier pumps. In addition to lead and other hazardous material abatement, AK Services now provides a wide variety of mobile water jet services, including surface preparation, coating removal, water jet cutting, hydro lasing and hydrodemolition. It works in pressures ranging from 17,000-psi 80-gpm high-volume for hydrodemolition to 55,000-psi 4-gpm for water jet cutting.

The company liked its Jet Edge equipment so much, it even became a Jet Edge distributor.

"Our Jet Edge pumps keep running and running," Canonica said. "They are 30 years old and they run in top condition. They are contractor-friendly, reliable and easy to maintain. The key is keeping the hydraulic oil clean. We have 9,000 hours on one of our Jet Edge's Cummins engines. It is a terrific engine."

Saved from the Crash by a Crash

AK Services' rise to the top of the water jet industry did not come without its fair share of obstacles. Just as the company's business began to take off, Boston's shipyard industry came to a screeching halt, almost killing the young company, but fate intervened and several unchartered rocks off of Martha's Vineyard became the company's savior.

In August 1992, the QE2 was just returning from a Nova Scotia cruise when she ran aground south of Cuttyhunk Island near Martha's Vineyard, severely damaging her hull. The shipyard hired AK Services to water jet the toxic inorganic tin surface from the ship's hull because it was deemed the safest method for its removal.

"The bottom looked like a claw had ripped it apart," Canonica recalled. "We had to take it down to bare steel and then the shipyard welded plates to fix it. We also cleaned the oil tanks. It was a true rescue mission for our young company."

AK Services branched out from the shipyard industry, taking on more and more challenging construction industry projects as its reputation gradually spread across the country.

In 2003, bridge contractor Kiewit found itself in a major bind as stubborn bedrock mangled 13 of the steel footing pilings it was driving during construction of the 1.7-mile northbound Benecia Bridge, which spans the Carquinez Strait linking Benecia and Martinez, Calif.

Kiewit hired AK Services to cut out the damaged pilings to make way for replacements. This dangerous project required AK Services' workers to be lowered in a basket down a 12' diameter caisson 150' feet below sea level. They used water jet cutting bugs on tracks held in place with suction cups to cut the 3" thick steel at an angle, resulting in an actual cut of 4 ½". AK Services ran two shifts for nine months, cutting a total of 3,500 lineal feet of steel.

Bridge contractor Kiewit hired AK Services to remove 13 pilings that were mangled by stubborn bedrock. AK cut 3,500 linear feet of steel, working in a caisson150' below sea level. Photos Courtesy AK Services

Continued...

Hanford Site Radiation Cleanup

AK Services has played an important role in the massive environmental cleanup project at the U.S. Department of Energy's Hanford Site in southeastern Washington.

Once home to nine nuclear reactors that produced plutonium for the Manhattan Project and for the nation's Cold War nuclear arsenal, the Hanford Site is considered the most contaminated nuclear site in the U.S., and is the site of the nation's largest environmental cleanup project.

"Our Jet Edge pumps keep running and running. They are 30 years old and they run in top condition. They are contractor-friendly, reliable and easy to maintain. The key is keeping the hydraulic oil clean. We have 9,000 hours on one of our Jet Edge's Cummins engines. It is a terrific engine."

- Patrick Canonica, AK Services

In 2009, the Department of Energy celebrated the removal of the site's notorious K Basin East Fuel Pool, a 120' L x 45' W x 20' D 1.2-million-gallon basin which was used to store 1,100 tons of highly radioactive spent nuclear fuel and radioactive sludge just 400 yards from the Columbia River. The radioactive waste was stored under 20' of water, and the basin's concrete walls and floor had absorbed radioactivity from the water. The Department of Energy's contractor determined that hydro lasing with an underwater ultra-high pressure water jet system would be the most effective and safest way to remove the contaminated concrete without exposing the radiation to air.

The contractor enlisted the help of AK Services, who partnered with S.A.Robotics of Colorado to develop an underwater hydro lasing robotic arm to blast away the radioactive concrete surface. The robotic system used 34,000 psi water jets to remove 7/8" of the pool's concrete surface, which housed 98% of the radiation. The work was performed under vacuum, and the contaminated concrete was sucked out as it was blasted away.

In another Hanford Site project, AK Services cut several 2' diameter vent holes into buried tanks that are holding radioactive waste from the Manhattan Project. This challenging project required them to cut through a carbon steel shell surrounded by reinforced concrete (total cut 18" thick) with a 55,000 psi abrasivejet. The government required them to use slower-cutting sand for abrasive rather than garnet because sand is natural to Hanford's desert setting.

AK Services Principal Owner Carl Franson noted that the company is currently working on yet another challenging project at the Hanford Site, cutting holes into 18" thick concrete tanks that also hold radioactive waste from the Manhattan Project so that the waste can be removed and vitrified for safe storage.

"The tanks have were built with a very small access riser and we are cutting a 55" diameter hole in the tank top to allow installation of a robotic arm to remove and transfer the waste to a vitrification plant that is under construction," Franson explained. "We are using Jet Edge's high-flow Permalign® cutting head powered by a Jet Edge diesel intensifier pump, and cutting at 48,000 psi. We are in the process of designing and building a specialty motion device for the project since the standard units are not compatible with the job."

Hazardous material removal has become one of the company's main services because water jet provides a safer and more environmentally friendly method for removing hazardous materials than traditional methods. In fact, when Boston's water authority needed to have PCB-contaminated caulk removed from a pumping station, they hired AK Services.

Continued...

Working under constant Environmental Protection Agency (EPA) supervision, AK Services used two specially engineered water jet crawlers to blast away and simultaneously vacuum the contaminated caulk, which was filtered out and properly disposed.

"This was in a pumping station over our drinking water supply so there was no room for error," Canonica said. "The caulking was still resilient even after 50 years, but the water jet shredded it. The EPA was very pleased with the procedure."

AK Services also has provided emergency waterjet cutting services to the petroleum industry, noted Pat Hickey, an NFPA Certified Marine Chemist and principal owner of AK Services. When a large petroleum distributor had a tank full of gasoline develop a leak in the floor, they contacted AK Services because they could safely cut holes in the floor to allow for the removal of contaminated sand under the tank.

AK Services safely cut holes in the floor of a leaking petroleum tank so contaminated sand could be removed from beneath the tank. Photo courtesy AK Services

"The tank was sitting on a 2' bed of sand, which was surrounded with concrete," Hickey recalled. "This sand became saturated in gasoline and they needed access through the floor of the tank in order to remove the contaminated sand. The combustible gas indicator had readings of over 100% of the lower explosive limit (LEL) in the area under the tank floor. A.K. used the abrasive jet cutting process to safely cut six holes, 3' in diameter in the 3/8" thick floor of the tank. One of the many advantages to this process is that it is not hot work and can be performed in atmospheres where conventional 'hot work' processes cannot be employed."

Freeways and Fenway

Concrete preparation has become AK Services' largest source of business as water jet has become the favorable method for coating removal.

"The coatings are so sophisticated and hard that you can't sandblast them," Canonica explained. "The water jet just pulverizes them and it purges the chlorides from road salt out of the concrete, while sandblasting lets the chlorides work their way back out and damage the new coatings."

"One of the many advantages to this process is that it is not hot work and can be performed in atmospheres where conventional 'hot work' processes cannot be employed."

- Pat Hickey, AK Services

Continued...

AK Services also has demonstrated that water jet is one of the most effective ways to prepare road surfaces for placement of Latex Modified Concrete (LMC) wear surfaces. When the LMC wear surface on Boston's Central Artery delaminated within a year of its initial installation and had to be replaced, the project specifications originally called for preparing the surface with shot blast, but Boston had very rainy summer that year and the steel shot was rusting on the roadway. AK Services was called in to prepare the road surface with waterjet because they could blast rain or shine. They built a custom 6' wide robotic water jet system with two 6' arms and equipped it with water jet spray bars from a Jet Edge Deckblaster system. They used this system to prepare the road surface for LMC on 90 percent of Boston's Central Artery, the Logan Bridge and the Ted Williams Tunnel.

Cutting apart a motorcycle for the History Channel's "SLICED."

The system not only prepared the surface, but it also removed any grease and oil that had leaked from the construction equipment and purged road salt chlorides from the concrete, improving the adherence of the new LMC. It did this without kicking up hazardous silica dust and, unlike shot blast, did not leave any rust stains following a rain shower.

"The highway department found that the surface had 12 times greater adherence with UHP than with shot blast," Canonica said.

In the winter of 2009/2010, the Boston Red Sox hired AK Services to remove 1-2" from the Fenway Park's leftfield seating steps so they could be leveled and resurfaced as part of the stadium's 2012 centennial renovation.

With only five weeks lead time, AK Services retrofitted a Jet Edge Deckblaster with a computer, spray bar and shroud so it could maneuver the lawnmower-like system along the narrow steps. With a 12-man crew and three souped-up Deckblasters, the company blasted away 8,500 square feet of surface. They strategically stationed their diesel-powered water jet pumps under the seating area to keep the steps warm enough to prevent freezing.

This can-do attitude and resourcefulness, combined with its willingness to specially engineer equipment, has helped AK Services build a thriving business that has grown primarily by word of mouth.

"You build on your reputation," Canonica said. "As we have successfully completed projects, the word has travelled."

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What our customers are saying:

"Jet Edge has always been there when we needed them. Downtime has been almost non-existent."
– Bruce Weeman, Metfab Engineering.

Jet Edge on the Web

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Mobile Equipment Maintenance Training

Training for Jet Edge's mobile equipment line is scheduled by request only. To request a class, please call 763-497-8700, Ext. 744

Quick Tips from the Jet Edge Applications Lab

When it comes to waterjet cutting applications, Brian Wallace has seen it all. Brian runs our waterjet applications lab. He cuts hundreds of test parts for prospective customers from materials ranging from tuna fish and tires to tool steel and laminated bullet-proof glass.

Brian has worked with a wide range of untempered glass, including float glass, decorative glass, Pyrex® and much more. He offers several tips for avoiding the common problems associated with waterjet cutting of glass.

Waterjet Cutting Glass

- Reduce the risk of chipping by using a low-pressure pierce of approximately 10,000 psi.

- Reduce low-pressure piercing time from two minutes to 10-15 seconds (depending on thickness) by cutting a tiny circle rather than leaving the jet fixed on one spot.

- 120 grit garnet will produce the best edge quality. If speed is your priority and chipping not a concern, use 80 grit garnet.

- Cut at 75,000 psi to increase cut speed by 50-75% and improve edge quality.

- Support glass on a sheet of 3/16" corrugated PVC rather than directly on the metal slats. This reduces the risk of chipping and fogging.

- If your projects require you to frequently raise and lower pressure, install a Jet Edge Dual Pressure Valve to save time and prolong pump component life.

- Tempered glass cannot be cut with waterjet.

See Glass and Ceramics cutting tips story in Ceramics Industry magazine, June 2010 issue!

See Story