Overview

PaR has developed the TensileTruss™ to provide an advanced method of equipment deployment and lifting capabilities for the robotics and industrial industries. PaR’s TensileTruss is a highly versatile tool that offers the ability to work in very large workspaces while providing high stiffness and 6 degrees of freedom for the lower platform that typical cranes or robots cannot offer.

Features

The TensileTruss is an equipment delivery platform that resembles an inverted Stewart platform but using cables instead of struts. The TensileTruss provides suspended multi-axis platform positioning, long vertical reach capability and an extremely stable work platform for deployment of equipment and tools. The TensileTruss employs six independent wire rope hoists for deployments of equipment that a crane or a mast would not be capable of handling. It is typically attached to a bridge-mounted trolley and is used as a platform for robotic manipulators and other remotely operated tools. When all six ropes, shown above, remain in tension the system behaves like a ridged truss structure. The Tensile Truss is an exclusive design and has the following features:

1) High side load capability
2) High overturning moment resistance
3) High rotational moment resistance
4) Anti Sway due to high side load capability
5) High lifting capacity
6) Seismically stable
7) Long vertical reach (engineered)
8) Compatible with multiple tools for one system
9) Operability in air or submerged
10) Proven up to 75 m extension
11) Capable of being radiation hardened to 109 rad lifetime
12) Remotely operable through wired or wireless controls
13) Less weight than equivalent sized mast

Deployments

The rigid platform provides an ideal delivery system for remote tooling. This, the safety elements, and the recoverability elements of the TensileTruss is the reason that PaR Systems was contracted to design and build systems for some of the most difficult nuclear decommissioning jobs in the world. For one of these jobs, a large robotic excavator arm is inversely attached to a rotating mounting plate to allow work to be performed in a complete hemisphere below the TensileTruss. For another application, the TensileTruss is used to deploy a set of highly dexterous underwater hydraulic manipulators. This system will be utilized for debris recovery, size reduction and packaging. Both systems are operated completely remotely and allow workers to be located up to 2 km away. All actions are to be performed using cameras and the systems sensors built into the TensileTruss design.
The TensileTruss design is capable of deployment of much more than just manipulators. Other examples of ideal applications for the TensileTruss are very large component transportation, building/equipment decommissioning, ship building, bridge construction, large scale inspection, active system maintenance in turbulent environments, pipe or beam fitting, painting/paint removing, inspection device deployment, and welding applications.

**Advantages**
- The TensileTruss offers many advantages over other equipment deployments methods.

**Safety**
- The TensileTruss offers increased safety for all application through the following design components:
  - Seismically stable due to the TensileTruss ability to “decouple” the side load once the maximum point is reached. Therefore, a TensileTruss can only transfer a engineered maximum side load to the trolley and bride and will not damage itself during an event.
  - Anti-sway and Anti-swing due to side load capability allows for movement of large loads without the risk of a swinging load hurting personnel in the area or damaging equipment.

**Versatility**
- Can be designed to have remotely exchangeable lower platforms. This allows for the deployment of any equipment at any time for the needs of the facility.
- Can locate services for the equipment, such as air or hydraulic supply, on the lower platform to limit cable runs and allow for deployment of any equipment the system can lift.
- Can engineer the system to have any lifting capacity that a crane can have while increasing the factor of safety of the design.
- Can be designed with a variable upper platform to have differing strength capacities for the required applications
- Can operate in “flying” mode which can be used to finely position and orientate the load without moving the crane.
- Can handle higher side and moment loads than a mast and at much longer reaches for less weight
- Capable of extremely high radiation resistance
- Easy decontamination since all surfaces accessible

**Reliability/Recoverability**
- The system is safely operable with as little as three of the six hoist in operation.
- Single failure proof because of the multiple hoist design.
- Will not be damaged by a side load beyond the rated load since the wire ropes will go slack.
Support and Service
At PaR Systems we offer the service, parts, support, and training you need to succeed. Our systems are proven dependable, but should you need assistance, our highly trained technical service engineers are available to help you. They are on-call 24 hours a day, seven days a week to ensure your system is up and running round-the-clock.

PaR care number:
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