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FIBRE OPTIC CABLE TECHNOLOGY deployed in harsh field conditions

Fibre optic cable is often subject to harsh field deployment conditions or high-efficiency broadcast installation requirements, as **Optical Cable Corporation (OCC)** explains

The wide use of HD video, emergence of 4K and 8K ultra-high broadcast standards, and increasing popularity in the audio-video sector is placing greater demands of data transmission systems. Fibre optic technology, with its ability to deliver digital, high-bandwidth and low signal-loss streams, provides an ideal solution for coping with those demands.

However, when it comes to remote broadcasting from harsh conditions, the advanced needs of permanent broadcasting studio infrastructures, and the increasingly popular use of audio-video technology among businesses and government agencies, a new set of demands is being placed on the fibre optic cable industry.

FIELD DEPLOYMENT APPLICATIONS

Sporting events are among broadcast's toughest venues, requiring the rapid pulling of miles of field-deployable fibre optic cable across fences, through water and along frozen ski slopes or blazing hot racetracks.

Remote broadcasts demand the brisk deployment of dozens of strands of cable to cameras that fly over football fields, hang from cranes, and are then re-gathered and tossed into crates to be shipped to the next venue. Most important, in these harsh environments and in various industries, the cable must survive again and again.

Remote broadcasting specialists such as IMS (Indianapolis Motor Speedway) Productions are involved with such rigorous field environments throughout the year. IMS Productions' Mobile Unit Group travels across the United States in heavy-duty trucks equipped with studios and satellite uplinks that provide live production services for sports and entertainment broadcasts and events.

"Our fleet of mobile studios travels to hundreds of events across the country throughout the year, sometimes having to set up and tear down the same day before heading to the next venue," says Paul Nijak, director of engineering at IMS Productions. "Even with all the rigours of meeting this schedule, remarkably little fibre cable gets broken – perhaps one or two pieces a year."

One of IMS Productions typical weeks includes providing broadcast production for the Verizon IndyCar Series, in locations such as St. Petersburg, Florida, where the 1.8-mile, 14-turn circuit incorporates city streets and a section of airport runway where 100,000ft of broadcast cable is laid behind temporary walls and fences, flown across sections of track and sometimes pulled through swamps and waterways.

Immediately following the race, IMS Productions' crew will gather up the cable and head cross country to a PBR (Professional Bull Riders) Built Ford Tough Series event, where an average of 15,000ft of cable is unspooled by hand around a ring where it is exposed to considerable grime and foot traffic.

The cable that IMS Productions utilizes for all the field events it covers is deployable broadcast-quality fibre manufactured by OCC.

The broadcast quality of this fibre cable is high enough to meet the 4K ultra-high-definition broadcasting standard

that IMS Productions is currently field testing with Time Warner Cable Sports.

"Our installations range from extremely hot to extremely cold temperatures," Nijak explains. "For example, this year we covered the Alberta Alpine Ski event in Calgary, Canada. At that venue we trenced down into the snow with a chainsaw to bury the cable so that groomers could pack snow over the top to help protect the cable. In total, we laid about 50,000 ft of OCC fibre running all the way up the side of the mountain."

Nijak adds that OCC invests time with his group, going out into the field and seeing how installers handled the cable.

PERMANENT INFRASTRUCTURES

Permanent broadcast fibre installations require the pulling of cable through a conduit that will stay in place as lasting infrastructures.

Diversified has a deep heritage in broadcast systems. The company provides design and integration services for TV stations, broadcast and cable networks,

IMS Productions Mobile Unit Group are equipped with studios and satellite uplinks that provide live production services





professional sports venues, mobile production units, as well as production and post-production facilities.

Many facilities require unique cable infrastructure so Diversified has an appreciation of the advantages fibre optic cable offers for greater durability and ease of installation. OCC's six- and 12-strand DX Series indoor/outdoor distribution cables are often used as a solution for many challenging installations.

The OCC cable has the inclusion of a rigid central strength member, which is of vital importance in permanent installations. Fibre cable is pulled through conduit and is often exposed to ten times the tension that it would normally incur.

On one project, Justin Guzman, Diversified's project engineer, and his team had a situation where the cabling in the building needed to be plenum rated. However, the final 200 feet of cable was in an underground conduit that was subject to flood-out.

"For our copper cable types we had to run both an underground-rated cable and a plenum-rated cable," Guzman explains. "Where the conduits emerged from underground we spliced them together. For the fibre, we were able to utilise the OCC DX indoor/outdoor cable series, which met the criteria for water blocking and plenum rating. This enabled us to forgo a lot of additional fibre splicing and management."

The OCC cable has the inclusion of a rigid central strength member

Guzman added that the unique capabilities of OCC cable met both criteria and saved labour and unnecessary splicing.

EXPEDITING AV APPLICATIONS

Companies large and small are dependent on using AV applications for critical services ranging from training to teleconferencing. Many of these applications require the integration of a variety of different AV devices within facilities at many geographic points. This often requires employing installation staff with skillsets such as crimping and soldering, particularly when various types of AV gear are not configured to work together.

When the companies transition AV facilities from analogue to digital, it requires a new type of cabling to carry digital signals. This means a different type of installation technician is needed – IT integrators. These technicians have the tools and skillset required to install fibre optic cable to transport packetised data, alongside cable to power the equipment. Performing this type of installation involves pulling both types of cable, cutting it to length, terminating it and then plugging it into AV gear.

However, if this process can be simplified, installation becomes more efficient and less expensive. In some past instances, OCC has provided AV users with hybrid cables that included both

the fibre optic and power cable all in one. Additionally, OCC has provided the cabling in kit form, with each kit containing pre-terminated, pre-cut cabling for connecting specific equipment housed in each of multiple (sometimes hundreds of) AV rooms. Each 'plug and play' hybrid cable is labelled with a specific part number and each cable box would be designated for a specific AV location, such as a conference room, lab or command centre.

This 'kitting' of the plug and play cable for specific AV room locations has allowed standard installation contractors to handle the installation tasks rather than requiring the expertise of IT or AV contractors. This can result in a reduction in installation time of as much as 25 per cent as well as saving significant money on labour.

Additional savings on the plug and play cable can also be realised when it is pre-terminated at the factory, which means it has also been pre-tested by factory technicians. This also provides a greater degree of reliability and reduces the time to certify the installed system.

OCC's line of SMPTE 311-compliant cables rounds up the company's cable offerings, providing a range of products for a variety of audio, video and broadcast applications across different industries.

Optical Cable Corporation
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