

## Steve Koontz Editing/Rewriting

This sample shows:

- The Source Document
- Tracked Changes
- The Final Version

# The Source Document

Hydro One Telecom, Canada: End to end fiber visibility with Viavi ONMSi fiber monitoring system Safety and reliability have always been top priorities for electric utility companies. With new devices being added to the mix, from wind turbines to smart meters and more, there are now thousands of new potential points of failure. Complex optical fiber based telecommunications network is critical to ensuring reliable power delivery.

Hydro One Telecom leverages parent company's fibre assets to deliver telecommunications solutions to carriers, financial institutions, enterprises, public sector organizations, utilities and more. Hydro One Telecom offers fibre-optic capacity to organizations with broadband network requirements, providing diverse, secure, high-capacity connectivity in Ontario with connections to Montreal, Buffalo and Detroit.

## The Challenge

Hydro One Telecom must ensure the reliability of the network in support of the grid and provide quality commercial services and assure SLAs,

To face this challenge, Hydro One Telecom recognized the need for a fiber monitoring system:

- to maximize network availability by reducing the time to repair in case of accidental fiber cut
- to anticipate fiber faults before they affect the service
- to provide a good customer support (to tell HydroOne Telecom customer if the issues they are facing could be caused by the fiber)
- to guarantee fiber integrity (tapping detection)
- to ensure that unused fiber will have appropriate performance when needed
- to minimize truck rolls (demarcation between fiber and network element fault helps to dispatch to fix and not to trouble shoot)

## The Solution

HydroOne organized a one month trial to evaluate vendor solutions. This process leads to the selection of Viavi to deploy its ONMSi system.

Hydro One selected Viavi for the following reasons:

- Viavi capacity to support Hydro One
- OTDR performance (best dynamic and dead zone on the market)
- The user friendly GUI designed for OTDR beginner as well as for OTDR guru
- The ONMSi functions that really help users in their daily tasks
- The integration capability with 3<sup>rd</sup> party application (OSS, GIS)
- The long term commitment of viavi to fiber monitoring system

The solution is based on Optical test units (OTU) that includes an optical time domain reflectometer (OTDR) and an optical switch to monitor the fiber in different directions. One OTU is enough to cover an area of more than 40 000Km<sup>2</sup>.

The OTU scans the network 24/7 looking for any fiber degradation on OTDR traces, automatically detecting and locating any faults. The user is immediately notified with a trouble ticket detailing the exact nature and location of the fiber fault.

A fiber attenuation change is located in minutes compared to the hours needed by traditional methods. Mean time to repair (MTTR) is significantly reduced since the exact location of the cut is identified for immediate repair by the field service teams.

Additionally early detection of small degradation can be used for pro-active maintenance in order to avoid catastrophic failure

The OTU can be used for monitoring the fiber whether it is in service or not. However long distance fiber monitoring uses preferably fiber without traffic (dark fiber) because it is more cost effective.

Hydro One selected Viavi for the following reasons:

- Viavi capacity to support Hydro One
- OTDR performance (best dynamic and dead zone on the market)
- The user friendly GUI designed for OTDR beginner as well as for OTDR guru
- The ONMSi functions that really help users in their daily tasks
- The integration capability with 3<sup>rd</sup> party application (OSS, GIS)
- The long term commitment of viavi to fiber monitoring system

## The Results

Hydro One Telecom “Deploying the JDSU ONMSi system enabled several very beneficial results:

- We gained immediate visibility into fiber integrity at any given time.
- ONMSi improved field service team utilization. As ONMSi detects fiber degradation before any service outage, maintenance can be better planned to synchronize with other interventions. Truck rolls and interventions can be kept to a minimum while ensuring improved network performance.
- There was a significant reduction in MTTR. It was reported that MTTR times were reduced from 8 to 4 hours—a 100% improvement—
- It ensures that SLAs are kept for fibers leased to external clients.

## The JDSU Solution

Hardware: OTU-8000 optical test units with multi wavelength OTDR and optical switch

Software: ONMSi enabling:

- Multiple users
- Web
- SMS and email notifications
- SNMP
- Integration with 3<sup>rd</sup> party GIS (Network engineer)
- Reporting and analytics

# Tracked Changes

## Canada's Hydro One Telecom, Canada: End-to-end monitors fiber visibility with Viavi ONMSi for reliable power while its Telecom subsidiary leases services

~~A complex fiber monitoring system~~ Safety-based telecommunications network is critical to ensuring the safety and reliability have always been top priorities for any electric utility companies. With company requires. And, with new devices being added to the mix, from wind turbines to smart meters and more, there are now thousands of new potential points of failure. ~~Complex optical fiber based telecommunications network is critical to ensuring reliable power delivery.~~

Hydro One ~~relies on its fiber assets for internal operations, while its Hydro One Telecom leverages parent company's fibre assets~~ the fiber optic capacity to deliver telecommunications solutions to carriers, financial institutions, enterprises, public sector organizations, and other utilities and more. Hydro One Telecom offers fibre optic capacity to organizations with broadband network requirements, providing. This diverse, secure, high-capacity connectivity serves customers in Ontario with and includes connections to Montreal, Buffalo, and Detroit.

### The Challenge

Hydro One Telecom must ensure the reliability of ~~the~~ their network into support of the grid and provide while simultaneously providing quality commercial services and assure assuring SLAs. To face meet this challenge, Hydro One Telecom recognized the need for a fiber monitoring system that would:

- ~~to maximize~~ Maximize network availability by reducing ~~the~~ mean time to repair in case of accidental fiber cut (MTTR)
- ~~to anticipate~~ Minimize truck rolls
- Anticipate fiber faults before they affect the service
- ~~to provide a good customer support (to tell Hydro One Telecom customer if the issues they are facing could be caused by the fiber)~~
- ~~to guarantee fiber integrity (tapping detection)~~
- ~~to ensure~~ Ensure that unused fiber will have appropriate performance performs when needed
- ~~to minimize truck rolls (demarcation between fiber and network element fault helps to dispatch to fix and not to trouble shoot)~~

### The Viavi ONMSi Solution

~~Hydro One organized a one month~~ Hydro One Telecom ran a trial to evaluate different vendor solutions. This process leads to the selection of Viavi to deploy its ONMSi system.

Hydro One selected Viavi for the following reasons:

- ~~Viavi capacity to support Hydro One~~
- ~~OTDR performance (best dynamic and dead zone on the market)~~
- The user friendly GUI designed for OTDR beginner as well as for OTDR guru
- The Viavi ONMSi functions that really help users in their daily tasks
- The integration capability with 3<sup>rd</sup> party application (OSS, GIS)
- The long term commitment of viavi to fiber monitoring system

The solution is based on Optical used optical test units (OTU) that ~~includes an~~included optical time domain ~~reflectometer~~reflectometers (OTDR) and ~~an optical switch~~switches to monitor the fiber in different directions. One OTU ~~is enough~~was sufficiently powerful to cover an area of more than 40 000km<sup>2</sup>.

The OTU ~~scans~~000 km<sup>2</sup>, continuously scanning the network ~~24/7 looking for~~to find any fiber degradation on OTDR traces, automatically detecting and locating any faults. ~~The user is~~When a fault was detected, technicians were immediately notified with a trouble ticket detailing the exact nature and location ~~of the fiber fault.~~

After one month, Hydro One Telecom selected Viavi to permanently deploy its ONMSi system. They chose the ONMSi for a number of reasons:

- OTDR performance
- A user-friendly GUI designed for technicians at any level
- Integration capability with 3<sup>rd</sup>-party applications (OSS, GIS)
- Viavi expertise and long-term experience with fiber monitoring systems

Other capabilities important to Hydro One Telecom included the ONMSi's ability to locate fiber attenuation ~~change is located~~changes in minutes compared to the hours needed by their traditional methods. Mean time to repair (MTTR) ~~is~~method. MTTR was significantly reduced ~~since~~by identifying the exact location of the cut ~~is identified for immediate repair by the~~cuts for field service teams.

Additionally~~And, the~~ early detection of small degradation ~~can~~could be used for ~~pro-active~~proactive maintenance ~~in order to avoid, avoiding~~ catastrophic ~~failure~~failures.

The OTU can be used for monitoring the fiber whether it is in service or not. However long distance fiber monitoring ~~uses preferably fiber without traffic (dark fiber) because it is more cost effective.~~

Hydro One selected Viavi for the following reasons:

- ~~Viavi capacity to support Hydro One~~
- ~~OTDR performance (best dynamic and dead zone on the market)~~
- ~~The user friendly GUI designed for OTDR beginner as well as for OTDR guru~~
- ~~The ONMSi functions that really help users in their daily tasks~~
- ~~The integration capability with 3<sup>rd</sup> party application (OSS, GIS)~~
- ~~The long term commitment of viavi to fiber monitoring system~~

## The Results

With ONMSi, Hydro One Telecom ~~“Deploying the JDSU ONMSi system enabled several very beneficial results:~~

- ~~We~~ gained immediate visibility into fiber integrity at any given time.
- ~~ONMSi improved~~improved field service team utilization. ~~As and, as mentioned,~~ ONMSi detects fiber degradation before any service outage, so that maintenance can be better planned to synchronize with other interventions. ~~Truck rolls and interventions can be kept to a minimum while ensuring improved network performance.~~
- ~~There was a significant reduction in MTTR. It was reported that MTTR times were reduced from 8 to 4 hours—a 100% improvement—~~

~~#~~Other capabilities important to Hydro One Telecom included the ONMSi's ability to locate fiber attenuation changes in minutes compared to the hours needed by their traditional method. MTTR was

significantly reduced, often cutting times in half, by identifying the exact location of cuts for field service teams. And, the early detection of small degradation could be used for proactive maintenance, avoiding catastrophic failures.

- ONMSi ensures that the company meets SLAs ~~are kept~~ for fibers leased to external clients.

### **The JDSU Solution**

Hardware: OTU-8000 optical test units with multi wavelength OTDR and optical switch

Software: ONMSi enabling:

- ~~Multiple users~~
- ~~Web~~
- ~~SMS and email notifications~~
- ~~SNMP~~
- ~~Integration with 3<sup>rd</sup> party GIS (Network engineer)~~
- ~~Reporting and analytics~~

# The Final Version

## ONMSi Delivers End-to-End Fiber Visibility

### Canada's Hydro One monitors fiber for reliable power while its Telecom subsidiary leases services

A complex fiber -based telecommunications network is critical to ensuring the safety and reliability any electric utility company requires. And, with new devices added to the mix, from wind turbines to smart meters and more, there are thousands of potential points of failure.

Hydro One relies on its fiber assets for internal operations, while its Hydro One Telecom leverages the fiber optic capacity to deliver telecommunications solutions to carriers, financial institutions, enterprises, public sector organizations, and other utilities. This diverse, secure, high-capacity connectivity serves customers in Ontario and includes connections to Montreal, Buffalo, and Detroit.

### The Challenge

Hydro One Telecom must ensure the reliability of their network to support the grid while simultaneously providing quality commercial services and assuring SLAs. To meet this challenge, Hydro One Telecom recognized the need for a fiber monitoring system that would:

- Maximize network availability by reducing mean time to repair (MTTR)
- Minimize truck rolls
- Anticipate fiber faults before they affect service
- Ensure that unused fiber performs when needed

### The Viavi ONMSi Solution

Hydro One Telecom ran a trial to evaluate different vendor solutions. The Viavi ONMSi system used optical test units (OTU) that included optical time domain reflectometers (OTDR) and optical switches to monitor the fiber in different directions. One OTU was sufficiently powerful to cover an area of more than 40 000 km<sup>2</sup>, continuously scanning the network to find any fiber degradation on OTDR traces, automatically detecting and locating any faults. When a fault was detected, technicians were immediately notified with a trouble ticket detailing the exact nature and location.

After one month, Hydro One Telecom selected Viavi to permanently deploy its ONMSi system. They chose the ONMSi for a number of reasons:

- OTDR performance
- A user-friendly GUI designed for technicians at any level
- Integration capability with 3<sup>rd</sup>-party applications (OSS, GIS)
- Viavi expertise and long-term experience with fiber monitoring systems

Other capabilities important to Hydro One Telecom included the ONMSi's ability to locate fiber attenuation changes in minutes compared to the hours needed by their traditional method. MTTR was significantly reduced by identifying the exact location of cuts for field service teams. And, the early detection of small degradation could be used for proactive maintenance, avoiding catastrophic failures.

## The Results

With ONMSi, Hydro One Telecom gained immediate visibility into fiber integrity at any given time. It improved field service team utilization and, as mentioned, ONMSi detects fiber degradation before any service outage so that maintenance can be better planned to synchronize with other interventions.

Other capabilities important to Hydro One Telecom included the ONMSi's ability to locate fiber attenuation changes in minutes compared to the hours needed by their traditional method. MTTR was significantly reduced, often cutting times in half, by identifying the exact location of cuts for field service teams. And, the early detection of small degradation could be used for proactive maintenance, avoiding catastrophic failures.

ONMSi ensures that the company meets SLAs for fibers leased to external clients.

Graphic: Diagram of ONMSi system, caption: ONMSi system architecture

Two quotes from Hydro One Telecom