

Career Episode 2

Resilience in Telecommunications: Troubleshooting, Maintenance, and Disaster Recovery at Globe Telecom

INTRODUCTION

2.1 This career episode, spanning from January 4 to March 9, 2022, details my role following Typhoon Rai's devastation in Cebu Province in December 2021. As a Globe Telecom field operator, I tackled the immense challenge of restoring communications amidst widespread destruction. The typhoon made vast areas inaccessible, disrupted communications, and razed buildings. My journey, marked by challenges, highlighted the essential role of telecommunications in crises, emphasizing both technical restoration and the profound human connections we aimed to re-establish.

BACKGROUND

2.2 In December 2021, Typhoon Rai, locally known as Odette, descended upon the Philippines, leaving Cebu Province in a state of unparalleled devastation. The typhoon's impact was more than just superficial scars on the landscape; it disrupted the very fabric of Cebu's economy. Vital infrastructures were destroyed, power lines were cut, and communication systems went offline. Amid this chaos, I, a field operator for Globe Telecom, embarked on a critical mission: the restoration of corporate leased line circuits across Cebu. My journey to the storm-stricken island began aboard a roll-on, roll-off ship (RORO) and marked the commencement of a rigorous two-month-long assignment that lasted from January 4 to March 9, 2022.

2.3 Equipped with my service-designated pickup truck, I meticulously arranged the essential tools and equipment required for our restoration efforts. Fibre optic splicing, a technique of paramount importance, was at the core of our operations. The array of tools and materials at my disposal ranged from basic fibre optic cables and fusion splice protectors to advanced devices like the OTDR for fault detection. But the endeavour wasn't restricted to technical aspects alone. Ensuring personal safety amidst the demanding and often hazardous conditions was equally vital. My protective gear encompassed everything from safety glasses and disposable gloves to face shields and ear protection, addressing the diverse challenges posed by the environment.

2.4 The challenges on the ground, however, went beyond mere technicalities and safety concerns. From Mactan to Toledo City, the scope of our operations spanned vast stretches of Cebu. The aftermath presented a grim picture: areas buried under debris, power poles grounded, and darkness where electricity once flowed. Assessing the state of Globe's infrastructure, like the condition of access nodes, became pivotal before initiating any restoration process. As we navigated this intricate maze, the operational status of various stakeholders, from government agencies to private corporations, shaped our restoration priorities. Beyond the tangible restoration of telecom systems, this mission symbolised a beacon of hope and a step towards rekindling normalcy for the people of Cebu, who had seen their lives drastically altered by Odette's fury.

PERSONAL TECHNOLOGIST ACTIVITY

2.5 *Deployment and Preparations:*

- The devastating aftermath of Typhoon Rai, locally named Odette, in December 2021 painted a bleak picture of Cebu Province. Entrusted with the mammoth task of restoring telecommunications for Globe Telecom, I initiated a systematic approach to address the situation.
- Embarking on my journey on January 4, 2022, I took a RORO ship. With a meticulously packed service vehicle filled with essential tools and equipment, I set forth, ready to face the challenges Cebu would present. My service vehicle is shown in Figure 1 below during deployment.
- My journey spanned restoring 2 circuits in Lapu-Lapu City, 8 in Mactan, 4 in Cebu City, 1 each in Danao and Naga, 3 in Carcar City, 4 in Argao, 2 in Moalboal, and 5 in Toledo City. This vast coverage presented logistical challenges and necessitated a rigorous strategic

approach.



Figure 1. My service vehicle is packed with essential tools and equipment

2.6 Areas Covered:

- Mactan, Lapu-Lapu City
- Parts of Cebu City
- Danao, Naga City, Carcar City, Argao, Moalboal, and Toledo City

2.7 Step-by-Step Fibre Optic Restoration Process:

1. **Initial Assessment:** Upon arrival, I assessed the extent of the damage. Due to the aftermath of the typhoon, most areas were plagued with debris and fallen poles and lacked electric power. I prioritised areas with power to ensure immediate connectivity.
2. **Access Node Check:** Before starting the restoration, I ascertained the condition of the access nodes. Many of Globe's towers had toppled, making it crucial to check node serviceability. An example of a toppled tower located somewhere near Toledo City is shown in Figure 2 below.



Figure 2. A toppled tower located somewhere near Toledo City

3. **Fault Detection:** Using the Optical Time Domain Reflectometers (OTDR), a sample of OTDR testing during Cebu restoration for one of the clients is shown in Figure 3 below. I precisely located faults in the fibre network, ensuring targeted and efficient repairs.

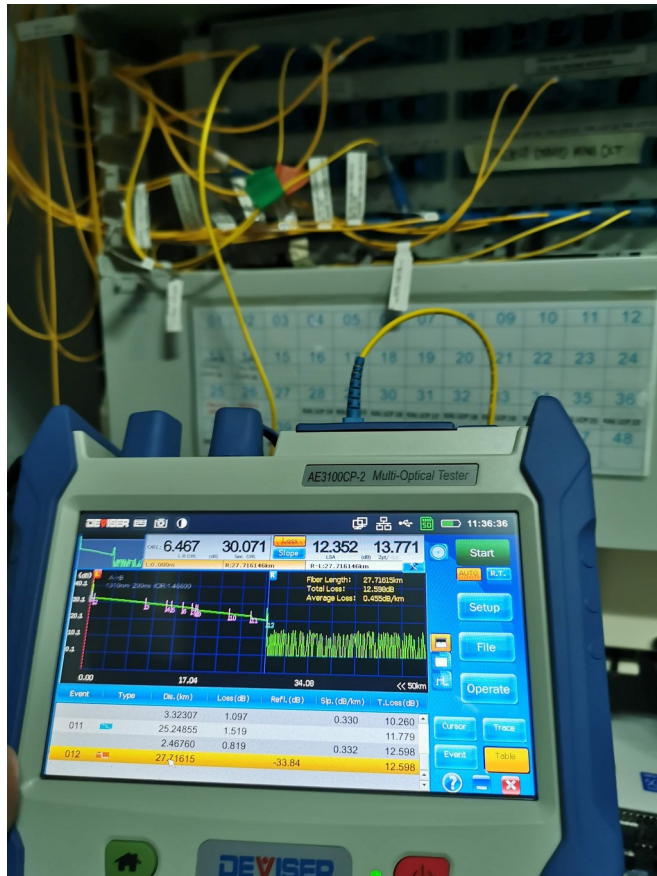


Figure 3. Testing of fibers using OTDR

4. Preparation for Splicing:

- I cleaned the fibre ends using alcohol and lint-free wipes.
- I stripped the outer jacket of the fibre cable to expose the inner cladding and core.
- My partner prepared the fibres by cleaving them, achieving a sharp and clean cut suitable for splicing, as depicted in Figure 4 below. Meanwhile, I set up the OTDR. In the background, you can see scattered debris and downed cables and wires.



Figure 4. Preparation of fibre for splicing.

5. Fusion Splicing:

- I joined the prepared fibre ends using the fusion splicer, melting their ends and fusing them together. I just completed the splicing of fibre as shown in the display of OTDR in Figure 5 below.



Figure 5. As seen on the OTDR display, I have just finished splicing the fibre.

- I secured and protected the spliced area using fusion splice protectors and a splice sleeve oven.

6. **Testing:**

- I deployed a Power Meter and Light Source to test the quality of the splice.
- I used an OTDR to measure the splice loss and verify the quality of our work.
- Addressing a partial cut, as shown in Figure 6 below, presents the most significant challenge in fibre restoration. Unlike a complete severance, where the issue is evident, partial cuts may only damage some fibres within the cable, leaving others intact. This makes it difficult to pinpoint the exact location of the damage, requiring more in-depth analysis and precision during the repair process. Furthermore, these partial cuts can introduce significant signal loss or intermittent issues, which can be harder to diagnose compared to the total loss of signal in a full cut. Thus, both the detection and repair of partial cuts demand meticulous attention and expertise.



Figure 6. Fiber optic cable partial cut due to pinching of lashing wire

7. *Physical Installation:*

- I secured the new fibre cables. Although many were affixed to existing infrastructure, we creatively anchored some to trees or steel columns as temporary solutions because of the typhoon's destruction, as illustrated in Figure 7 below with my partner and me.



Figure 7. *Steel columns are temporarily used for fibre attachment*

8. *Finalising Installation:*

- I safely stored spliced fibres in protective splice inclosures to shield them from external damage.
- For the entire restoration project, I used over 10 kilometres of 12-core drop fibre and 3 kilometres of 24-core drop fibre. To enhance the durability and efficiency of the installations, I employed over 30 fibre inclosures, supplemented with various fibre sleeves, cable ties, and heat shrink tubes.

2.8 *Restoring Leased Line Clients Affected by Faulty Modems and Routers*

1. **Assessment:** I began by identifying clients with faulty modems and routers. This list spanned banks, educational institutions, BPOs, and more.
2. **Replacement:** I swiftly replaced faulty modems and routers with new ones and configured each device to the client's specifications.
3. **Configuration and Testing:**
 - For each replaced device, I ensured proper configuration settings were established.
 - Performed connectivity tests to confirm the stability and efficiency of the network.
4. **Client Verification:**
 - Once satisfied with our internal checks, I asked clients to verify the restoration on their end, ensuring they were back online and operational.

2.9 *Challenges and Adaptations:*

1. **Inflation:** The aftermath of the typhoon saw a surge in the prices of common commodities, putting additional financial strain on the restoration process.
2. **Fuel Scarcity:** Diesel fuel was limited, making vehicular movement challenging. Prioritisation of areas was done not only based on power availability but also on proximity and fuel availability.
3. **Environmental Challenges:** Due to fallen poles and trees, setting up new lines was a challenge. Innovative solutions like tying cables temporarily to trees were used.
4. **Prioritisation:** While all areas were essential, prioritising areas where customers (banks,

- government agencies, etc.) were operational helped in a faster economic recovery.
5. Concurrent Efforts: Concurrent restoration efforts from multiple telecom groups presented coordination challenges. It required clear communication to prevent overlapping efforts and ensure that every region received the attention it needed.
 6. Reflecting on the manpower utilised during this project, I believe the inclusion of two additional personnel might have expedited our progress, especially across the vast territories we covered. This mission underscored the paramount importance of teamwork. Collaborative efforts not only promote efficiency but also ensure a multifaceted approach to problem-solving, allowing diverse perspectives to emerge.

SUMMARY

2.10 From January 4 to March 9, 2022, after Typhoon Rai devastated Cebu Province, I, as a Globe Telecom field operator, embarked on the mission to restore communications. Typhoon Rai disrupted Cebu's infrastructure, severing power and communication lines. With my equipped service vehicle, I covered vast stretches from Mactan to Toledo City. The restoration process encompassed fault detection, fibre optic splicing, and repairing infrastructure, such as replacing faulty modems for key clients like banks and educational institutions. Amidst challenges like inflation and fuel scarcity, innovative solutions, like tying cables to trees, were implemented, emphasising the need for swift restoration during disasters.