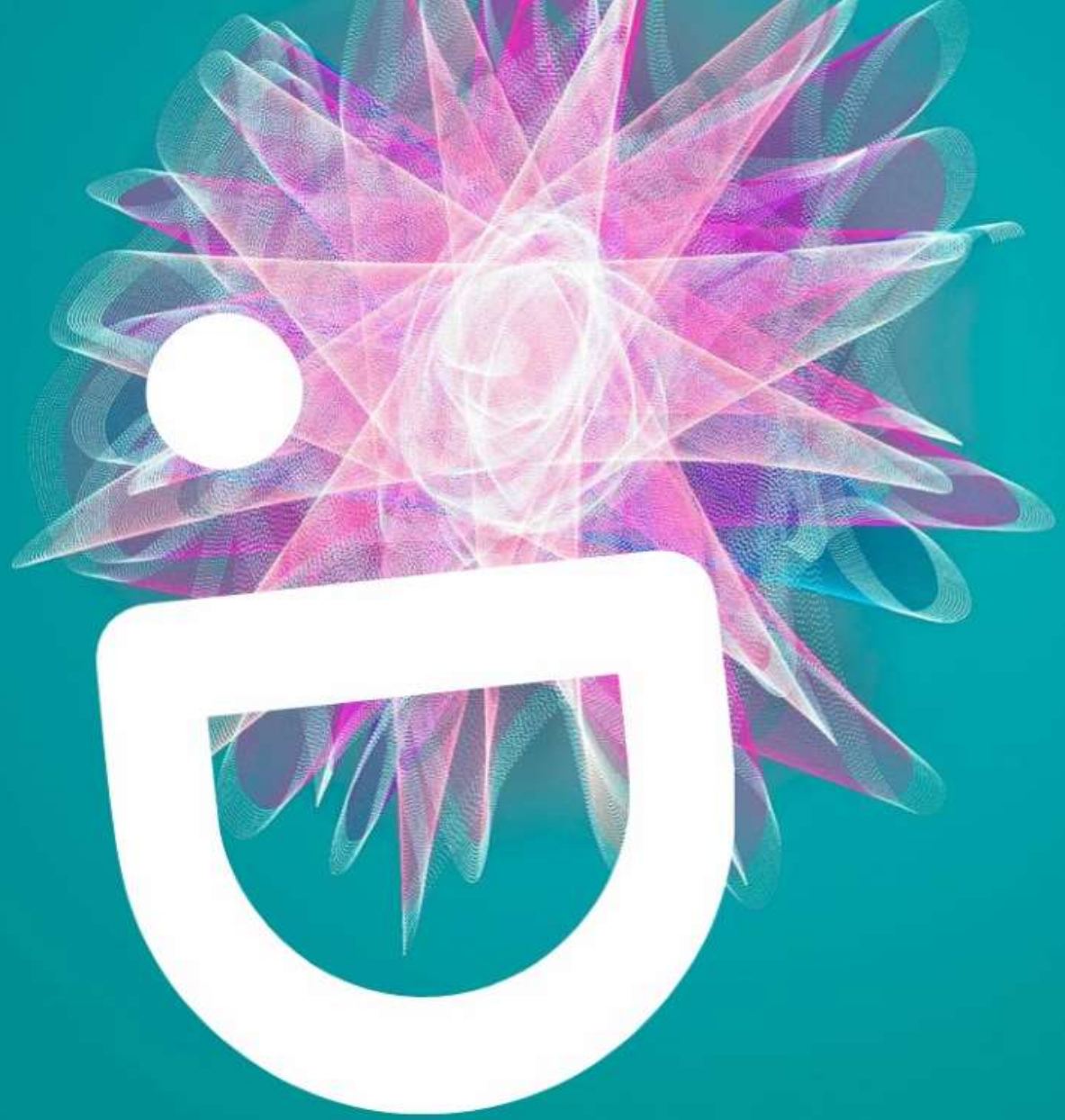

Code of Practice for Info-Communication Facilities in Buildings

Briefing to Industry

(by invitation)

7 December 2018

Friday, 10am

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Agenda

1. **Background on COPIF**
2. **Key Changes Adopted for COPIF 2018**
   i. Rooftops as *preferred* Mobile Installation Space
   ii. Modifications to in-home co-axial cabling
   iii. New residential buildings: Additional fibre and data points
   iv. New non-residential buildings: 2-way air-blown fibre microducts
   v. Resilience requirements for networks/services, emergency access
3. **Implementation of COPIF 2018**
4. **Questions and Answers**

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Code of Practice for Info-communication Facilities in Buildings (COPIF): an Introduction

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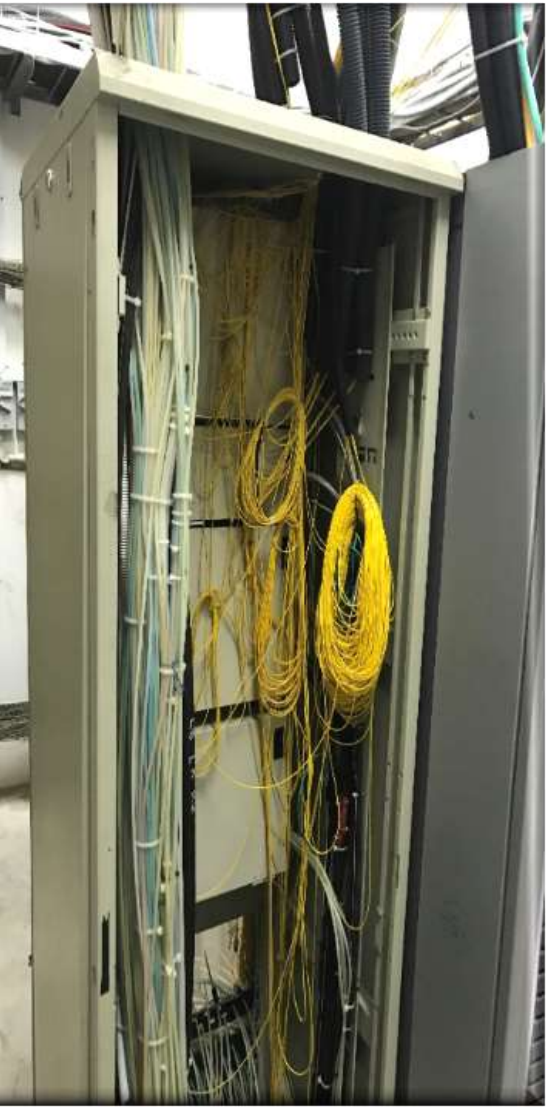
1) Background on COPIF



Telco rack in MDF

- Issued by IMDA, draws powers from Telecommunications Act
- **Purpose**: To ensure that developers or owners of buildings provide **adequate space and facilities**, for telecom licensees' **provision of infocomm services**
- Space and facilities include:
  - Main Distribution Frame ("**MDF**") Room, Telecom Equipment Room ("**TER**"), Mobile Installation Space ("**MIS**"), underground pipeline systems, risers and cable trays/trunking, associated with a development;
  - in-home cabling, e.g. pre-laid internal wiring
- COPIF specifies the **duties of telecom licensees and building developers or owners** on such matters
- COPIF 2018 effective on **15 Dec 2018**
  - First published in 2000, revised in 2008 and 2013
  - Completed 2 consultation rounds in Jun 2017 and Jun 2018

Enhancing features, enabling new tech adoption

Underpinning issues

- Expectations of end users
  - Enhanced connectivity, wired and wireless, on-the-go

- Telecommunications (Amendment) Act 2016
  - Operationalise changes introduced under legislation, align COPIF with TA as announced by Min(CI)

- Objective of COPIF 2018
  - Adapt to market, adjust with landscape changes
  - Enable user access to new technology as it arises

- Complemented by QoS framework

COPIF 2018:
Key Changes Adopted and Implementation

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2i) Designation of Preferred Mobile Installation Space (MIS) – Rooftop MIS (1/3)

Purpose: Rooftop MIS to serve surrounding areas for enhanced, wider mobile coverage

Base stations and antennae on roof top

Mobile Installation Space to be provided by building developers or owners:
Specified amount of space to be provided without charge, for mobile deployment

New
COPIF 2018 requirements
• Mobile Network Operators ("**MNOs**") to decide on MIS location, due to their expertise on deployment • Option for MNOs to use rooftop MIS to also serve external areas *Benefits:* • Enhanced coverage for end users • Shorter provisioning time *Affects*: • All buildings, new and existing; • Existing agreements to remain in force until expiry

2i) Designation of Preferred Mobile Installation Space (MIS) – Rooftop MIS (2/3)

Rooftop MDS

Mobile equipment (blending-in with rooftop)

Floor-standing equipment

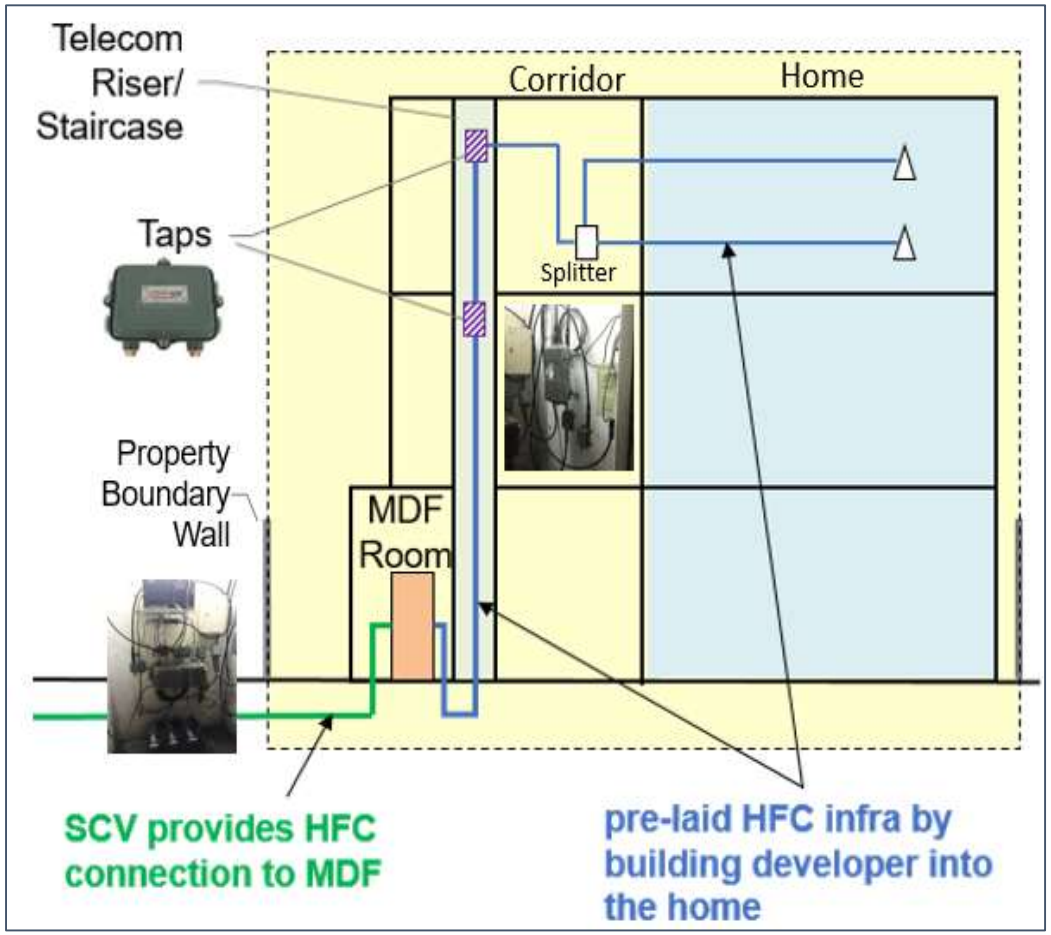
2i) Mobile Installation Space (MIS) – Treatment of ancillaries and associated apparatus (3/3)

Type of ancillary/ associated apparatus	Computed as MIS?
Cabling/trunking and cable trays	No
Ceiling-mounted indoor cones/antennae	No
Camouflage (i.e. reasonable aesthetics)	No
Antennae (with footprint)	Yes
Base transmission system (BTS) (with footprint)	Yes
Combiner (with footprint)	Yes
DB box (with footprint)	Yes
Remote Radio Unit (RRU) (with footprint)	Yes

2ii) Modification of in-home co-axial cabling (1/2)

Purpose: Repurpose co-axial cablings for re-distribution of Digital TV signals

Cross-sectional view of high-rise residential building showing COPIF 2013 requirements (in blue):



New

COPIF 2018 requirements

- No longer a need for developers or owners to:
  - pre-lay co-axial cable from Main Distribution Frame (MDF) room, up the riser, and into the splitter (located in closet of each home)

- Developers or owners need only provide in-home co-axial cablings, due to Hybrid-Fibre Co-axial (HFC) cessation

Benefits:
- Lower construction cost to developers or owners

Affects: New residential buildings and landed homes

2ii) Modification of in-home co-axial cabling (2/2)

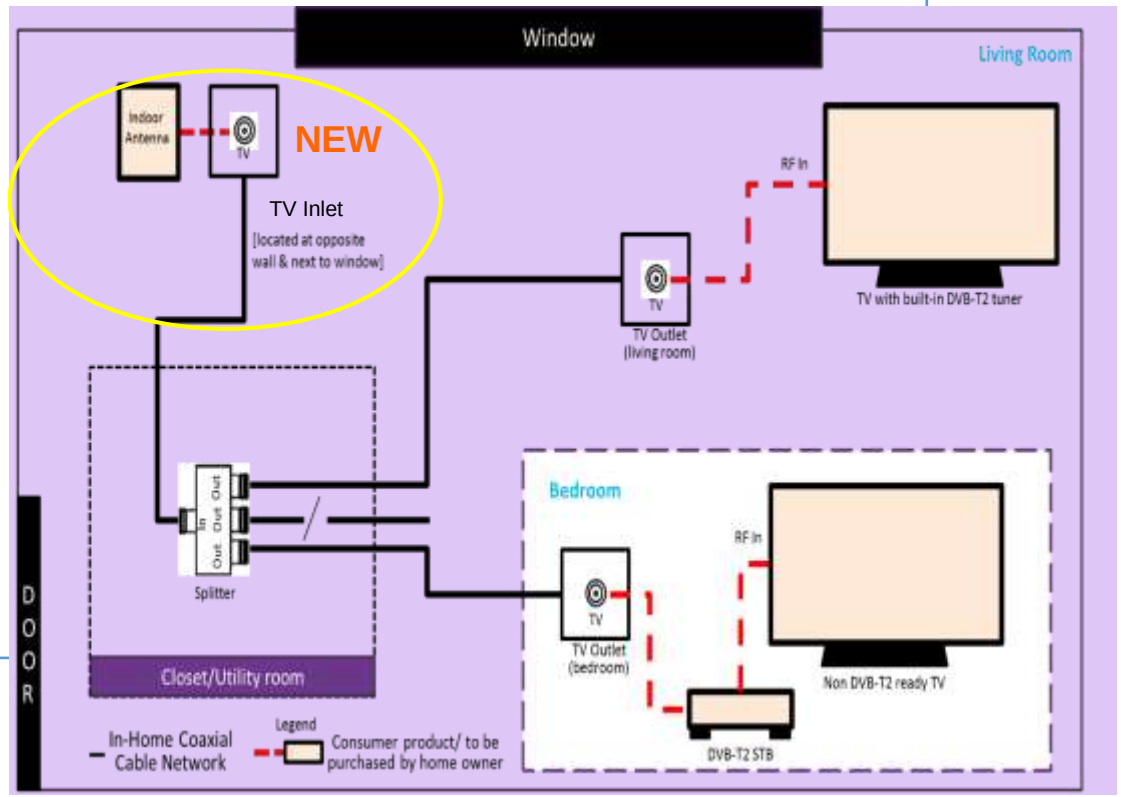
New
COPIF 2018 requirements

- Developers or owners continue to install 1 co-axial cable point in living room and every bedroom
- Add 1 new input socket in the living room; resident can connect an indoor antenna to re-distribute Digital TV signals

Benefits:

- Homes can use single indoor antenna and re-distribute

Affects: New residential buildings and landed homes



2iii) New Residential Buildings: additional fibre and data points (1/2)

Purpose: To enable faster technology adoption, more varied services in homes

New

COPIF 2018 requirements

- Provision of additional fibre:
  - optical fibre cable in each residential unit
  - category 6 Ethernet cables with RJ45 outlet in each room

- Developers or owners:
  - must provide 4-fibres from telecom riser and into each home;

- Telecom operator:
  - connect their fibre to 1 of the fibres;
  - required to remove their fibre once customer terminates fibre subscription

Benefits:

- Allow end users to enjoy greater number of services provided over fibre infrastructure

Affects: New residential buildings and landed homes

2iii) New Residential Buildings: additional fibre and data points (2/2)

	New requirements
Location within residential unit	**Number of data point(s) (Category 6 or better) per location COPIF 2018**
Living room	2
Master bedroom*	2
Kitchen#	1
Each bedroom	1

*Additional data point
New location for data point

2iv) New Non-Residential Buildings: 2-way Air-blown Fibre (ABF) Microducts(1/2)

Purpose: To enable telecom operators' faster provisioning to customers

New

COPIF 2018 requirements

- Developers or owners to pre-lay (and label) the 2-way air-blown fibre microducts from the riser to each unit on each floor

- On-going obligation by developers or owners to provide additional 2-way air-blown fibre microducts to sub-divided units

Benefits:

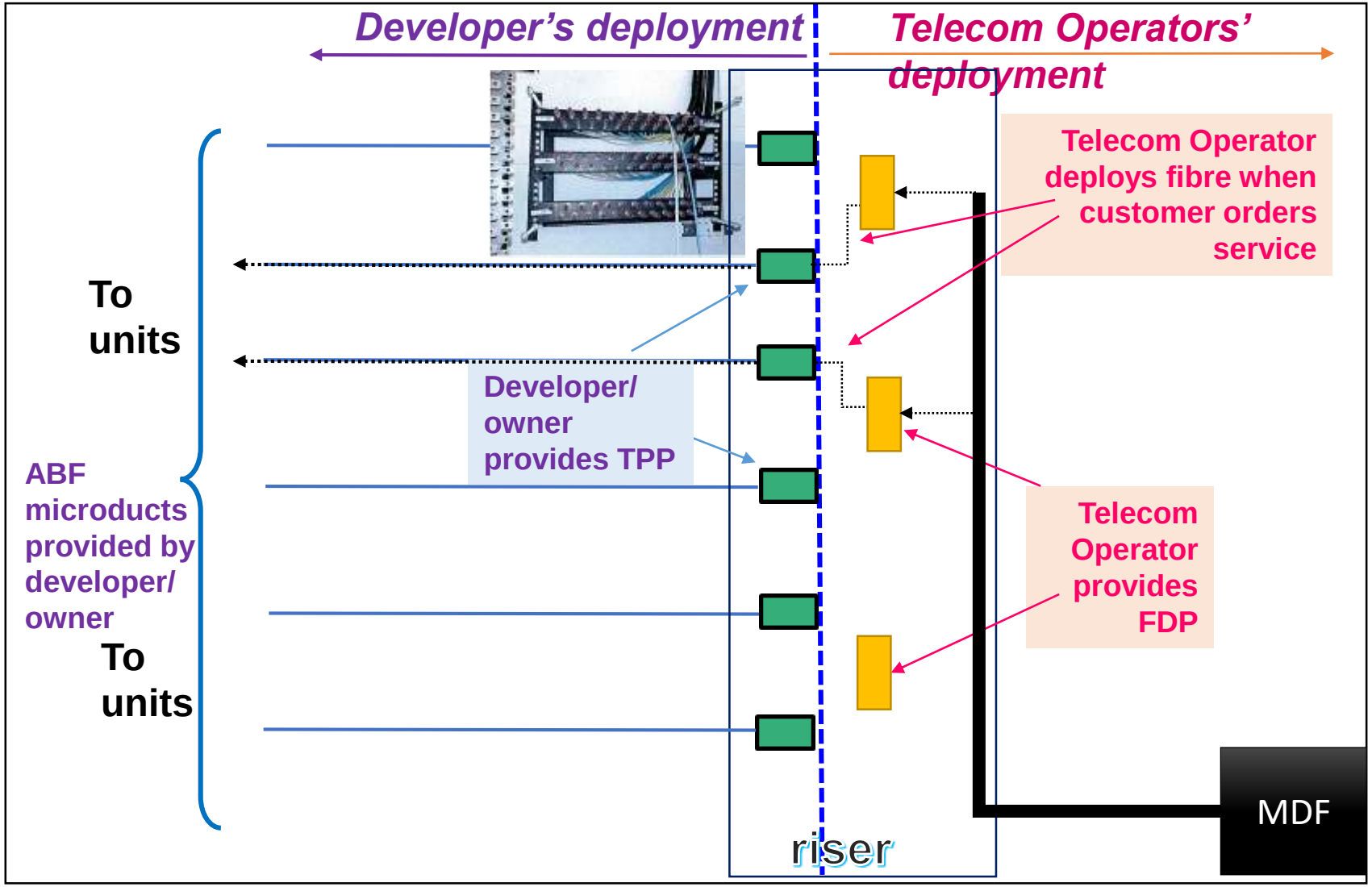
- Improves service provisioning for businesses/tenants
- Neater, better for telcos' maintenance

Affects: New non-residential buildings

2w Ducts @ Unit

2iv) New Non-Residential Buildings: 2-way Air-blown Fibre (ABF) Microducts (2/2)

- Developer's/owner's responsibility for Tube Patch Panel (TPP) at the riser
- Telecom Operator blows fibre directly to Fibre Distribution Point (FDP) at the riser



2v) Resilience requirements: Emergency Access to Space and Facilities

Purpose: Ensure clear processes, less delay for urgent restoration of services

New

COPIF 2018 requirements

- Developers or owners and telecom operators to co-operate on such access

Building type	Timeframe for Emergency Access to be provided
Manned	Within 2 hours from the receipt of licensee's notice
Unmanned	As soon as possible and in any case not more than 8 hours from the receipt of licensee's notice

Benefits:

- Clarity in Emergency Access situations and minimise delays to service restoration

Affects: All developments, new and existing (except to road/train tunnel locations, where disruptions would be caused to commuter and traffic services)

* "**Emergency access**" defined under new COPIF as:
Situations that require **urgent restoration** of telecommunication service(s), due to **unplanned** outage or downtime, which **cannot be resolved** by the Licensee **remotely**.

2v) Resilience Requirements: Network and Service (1/2)

Purpose: Support enhancement of networks and service diversity

New
COPIF 2018 requirements
• Definite list of buildings that house vital services (e.g., hospitals, ports of entry, data centres etc.) • Building developer to provide dual set of infrastructure (i.e. MDF room, cable systems) to enhance resilience of network and services *Affects:* All such new buildings

2v) Resilience Requirements: Network and Service (2/2) – Enhancement of Network and Service Resilience

COPIF-specified list of buildings housing vital services requiring resilience and diversity provisioning. These include:

- hospitals;
- ports of entry for land, air and sea, including immigration checkpoints;
- police and fire stations;
- utility plants;
- data centres; and
- key financial centres such as the Stock Exchange.

Other types of buildings not listed above may also have diversity provisioning, if the developer/owner decides and sees fit to do so based on the development's needs.

What's new - recap

Key Changes Adopted

- ***Preferred* Mobile Installation Space** (renaming only, conceptually the same)
  - Designation of rooftops as *preferred* MIS
  - Location of MIS (selected by MNO in consultation with BO)
- **Residential requirement**: 4-core fibre (i.e. additional 2-core fibre)
- **Modification of co-axial cabling** inside homes
- **Non-residential requirement**: 2-way ABF microducts pre-installation
- **Resilience** requirements, including **Emergency Access**

❖ ***Co-operation*** *from all parties needed, benefits all*

3) Implementation of COPIF 2018

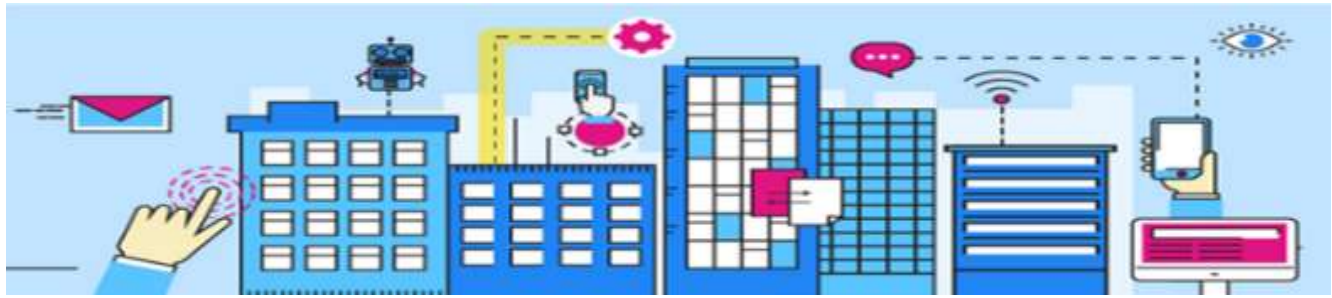
COPIF 2018 and Guidelines

- Issued on 28 November 2018
- **Effective <u>15 December 2018</u>**

Contact for queries on requirements

Send e-mail to:

Interconnect@imda.gov.sg



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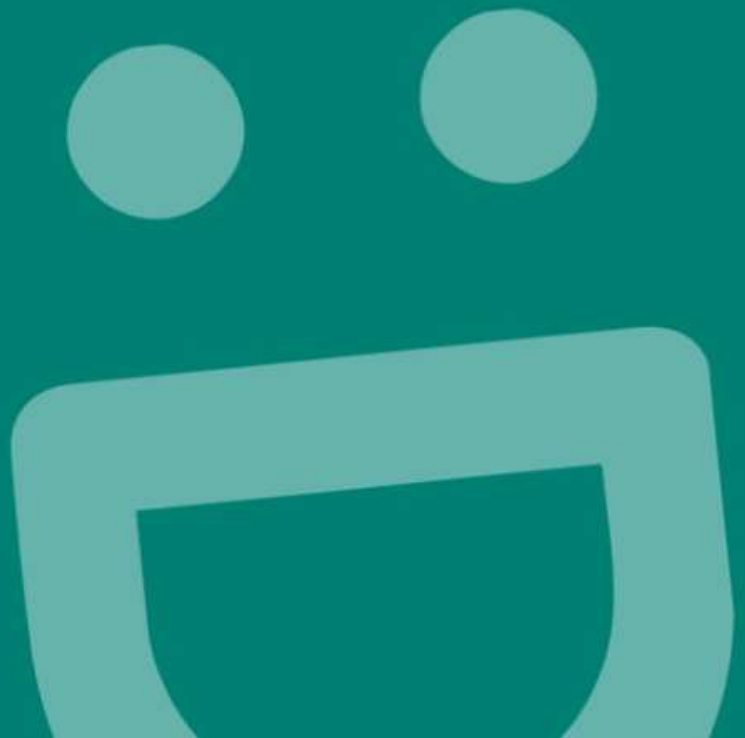
Questions and Answers

Please identify yourself, **clearly stating** your:

- **name**
- **company and**
- **question**

Thank you



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