Annex D

Reference Interconnect Offer

Joint Working Manual Annex 2.0

March 31, 2022

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1. CHAPTER 1 – TECHNICAL SPECIFICATION

1.1 Introduction

1.1.1 This chapter describes the technical specifications applicable to the Services as described in Annex B (Services) to the Agreement. The specifications in this chapter are applicable to both Parties.

1.2 Technical Characteristics for the Interconnection Link Services

1.2.1 Principles

1.2.1.1 An Interconnection Link will join GT&T's Interconnection Location ("IL") in Georgetown to Telco's interface switch transmission telecommunications Equipment at Telco's IL in Georgetown.

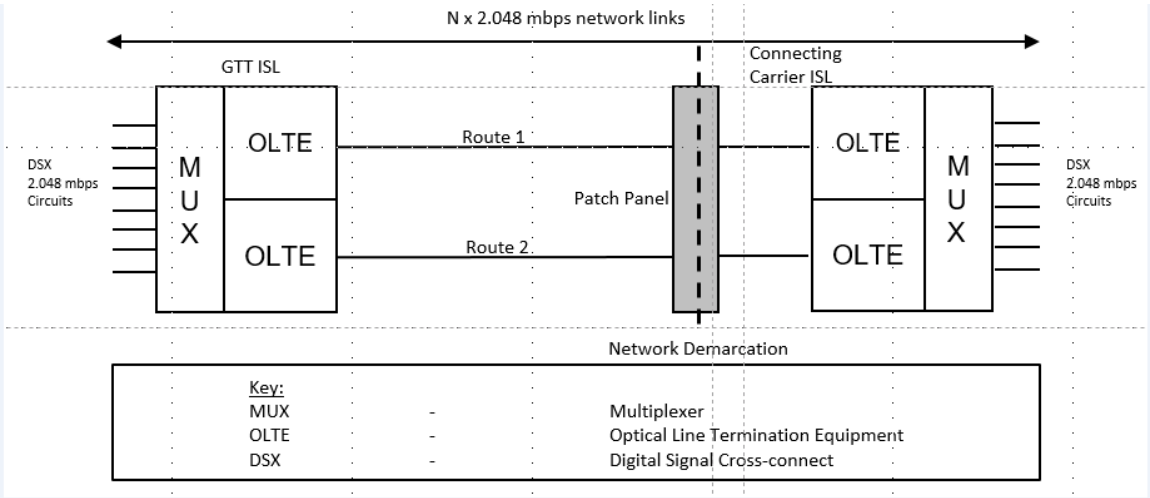
1.2.1.2 Telco's IL must be within an interconnect access area defined by GT&T's IL boundary of 3,646 meters cabling route distance.

1.2.1.3 All Interconnects will comprise of at least two optical fibre cables (2 strands/cable) connecting GT&T's IL to Telco's IL and Telco's IL to GT&T's IL.

1.2.1.4 All Interconnection Links will comprise of: (i) the fibre electronics, circuit terminating unit ("CTU") at GT&T's end of the Interconnection Link, (ii) a corresponding fibre electronics CTU at Telco's end of the Interconnection Link, and (iii) the point-to-point optical fibre between the two.

1.2.1.5 All Interconnection Links will be based on Synchronous Digital Hierarchy ("SDH"). ETSI standard G.703 interface will be used. All SDH Facilities and telecommunications Equipment should conform to SDH transport system standards in an N x E1 methodology. Figure 1 below visually depicts an Interconnection Link and shows two fibre routes in different locations, and terminal equipment in one Interconnect location, as further described below.

Figure 1: The Interconnection Link



1.2.2 Diverse Routing

1.2.2.1 Apart from where cables enter and traverse cable vaults, the Transmission routes (Route –1 and Route –2 in Figure 1) will be diversely routed. Separation distances will depend on cable design parameters and on the Parties' confirmation of their IL locations.

1.2.2.2 The physical interface between GT&T's system and Telco's system will be Telco's fibre patch panel, configured for FC ("Ferrule Assembly") terminations. For the avoidance of doubt, the physical interface is the Point of Connection.

1.2.2.3 Single mode optical fibre cable parameters are as follows:

Wavelength nm		1300	1285-1330	1550
Attenuation (dB/Km):	Typical	0.36	0.36	0.24
	Maximum	0.40	0.42	0.25

The non-uniformity will be ≤ 0.01dB.

1.2.3 Circuit Termination Unit Specifications

1.2.3.1 All CTU Facilities and telecommunications Equipment must conform to SDH standards and any additional standards specified in this Chapter, and must be compatible with the other Parties' facilities and telecommunications Equipment.

1.2.3.1.1 The telecommunications Equipment used by Telco for Interconnection Links conforms to ETSI SDH G.703.

1.2.3.1.2 The telecommunications Equipment used by GT&T for Interconnection Links conforms to ETSI SDH G.703.

1.2.4 2.048 Mbit/s Network Link Characteristics

1.2.4.1 The links for Interconnect are based on the 2048 Kbit/s signalling system as described in ITU-T G. 703 ETSI standards.

1.2.4.2 The Parties shall adopt the same standards as set out in the ITU-T recommendations for the links for Interconnect, for the following:

- Tolerance on links
- Alarms on links
- Filter on links
- Errors on links

1.2.5 Electrical Characteristics

1.2.5.1 The output jitter for the links for Interconnect shall not exceed 0.75 UI under worst-case operating conditions when measured in the frequency range 20 Hz to 100 KHz, as defined in ITU-T G.921 Table 3.

1.2.5.2 The tolerance of both the Telco and the GT&T input ports to jitter shall be as defined in ITU-T Recommendation G.823.A jitter measuring set conforming to the requirements of ITU-T Recommendation O.171 (Timing Jitter Measuring Equipment for Digital Systems) shall be used to measure jitter. Telco and the GT&T shall cooperate in the application of testing methods as described in ITU-T Recommendation G.823.The wander specification for the links for Interconnect is set out in ITU-T recommendation G.823. The maximum values of wander at input ports must conform to section 3.1.1 of ITU-T Recommendation G.823. Functional CharacteristicsEach 2.048 Mbit/s link for Interconnection shall be transparent and independent of any Traffic stream passed across it.The functional characteristics of the interface for the 2.048 Mbit/s links for Interconnect must conform to ITU-T recommendations G.704 and G.706 and the additional requirements specified below. 2048 Kbit/s interfaces shall conform to ITU-T G.803 and G.821 for generation of AIS and RAI alarms, and with G.823 for slipping conditions.

1.2.6.4 At the digital interface, the analogue information shall be encoded using the 8bit, A-law characteristic in accordance with ITU-T Recommendation G.711 such that a 64Kbit/s time slot at the Point of Connection can be decoded using an 8 bit, A-law decoder. The bit pattern of a free channel shall be in conformity with ITU-T recommendation Q.522.

1.2.7 Synchronisation

1.2.7.1 Each Party will use its own synchronisation conforming to the synchronisation standards addressed in ITU-T G.703.

1.2.7.2 When the Parties synchronise, it shall do so via nominated links for Interconnect consistent with the telecommunications Equipment specifications in Section 1.2.3. above.

1.2.7.3 The Parties will provide each other the 2.048 mbps interface for synchronisation on any two links. (Accuracy of $1.6x10^{-8}$ and stability of $1x10^{-10}$/day). Clock will be referenced to a stratum 1-system clock.

1.2.7.4 The nominated synchronisation channels will be time slot (zero) on any network link.

1.2.7.5 The maximum wander shall conform to ITU-T G.811 and G.812. The synchronisation shall meet the requirements of ITU-T G.703 and is traceable to Stratum 1 source (minimum accuracy of ±1x10-11).

1.2.8 Safety and Protection

1.2.8.1 All telecommunications Equipment will comply with UL 1950 and/or national safety standards whichever is the most stringent.

1.2.8.2 For high voltages, telecommunications Equipment will comply with ITU-T K.11.

1.2.8.3 If radio equipment is used, it will comply with the international standard ITU-T K.37 to protect employees from electromagnetic radiation with a power in excess of 1 milliwatt per centimetre.

1.2.8.4 The screen of the cable at an output port must be connected to the metal cabinet, which holds the equipment. The screen of the cable at an input port must be earthed.

1.2.9 Electromagnetic Compatibility

1.2.9.1 All links for Interconnect telecommunications Equipment must comply with ITU-T K.43 for network equipment Electromagnetic Compatibility ("EMC") requirements and must comply with any national regulations relating to electromagnetic and electrostatic compatibility.

1.2.9.2 All links for Interconnect telecommunications Equipment must comply with ITU-T K.42 for immunity to radiated electromagnetic energy.

1.2.9.3 All links for Interconnect telecommunications Equipment must comply with national standard and/or ITU K.32 whichever is more stringent for electrostatic discharge.

1.2.9.4 All links for Interconnect telecommunications Equipment must comply with EN 55022 class B or FCC Part 15 for radiated and conducted emissions.

1.2.9.5 All links for Interconnect telecommunications Equipment must comply with any national regulations relating to electromagnetic and electrostatic compatibility.

1.2.9.6 The links for Interconnect telecommunications Equipment must be immune to radiated electromagnetic field of up to 3V/m.

1.3 Quality of Service for Interconnection Links

1.3.1 Definitions

1.3.1.1 Interconnection Link Availability, Errored Seconds, and Severely Errored Seconds are the parameters used to measure the quality of service of the links for Interconnect. These quality of service parameters are applicable to all Interconnection Links that are delivered by the Parties. Measurements of these service quality parameters will be specified in minutes per calendar months and will be on a per link basis.

1.3.1.2 The definition of "Interconnection Link Availability" (%) for a Party is:

$$100 * \frac{\text{(total time – time allocated to Planned Maintenance – time link not available for traffic due to System Faults)}}{\text{(total time – time allocated for Planned Maintenance)}}$$

where the unit of time is minutes and total time is calculated as the number of days in the month multiplied by 1440 minutes.

1.3.1.3 The definition of "Errored Second" is a one second interval with one or more bit errors.

1.3.1.4 The definition of "Severely Errored Second" is a one-second period, which has a bit error ratio greater than or equal to 10^{-3}.

1.3.2 Quality of Service Levels

1.3.2.1 The following quality of service levels are applicable to the Interconnection Links and is based on ITU standard G703:

1.	Network Link Availability	> 99.9%
2.	Percentage of Severely Errored Seconds	≤ 0.055%
3.	Error Free Seconds	> 99.0%

1.4 Signalling Principles

1.4.1 Signalling Principles

1.4.1.1 Signalling applied to Interconnection Links shall be Signalling System No. 7, which conforms to ETSI standards. Operator dependent implementations of the signalling protocol at the network interface will not be supported.

1.4.2 Circuit Related Signalling

1.4.2.1 3.1KHz audio and speech bearer services shall be supported.

1.4.2.2 In principle, the Parties will transfer signalling messages transparently through its System. However, neither Party can guarantee proper end-to-end inter-working of signalling messages originating or terminating outside their System.

1.4.3 Protocols

1.4.3.1 The MTP (ETS 300 008) and ETSI ISUP V1 (ETS 300 121) protocols shall be supported.

1.4.3.2 The signalling mode shall be fully associated.

1.4.4 Parameter fields

1.4.4.1 Network indicator 11 (binary notation) and the National Transit Domain point-codes shall be used. The CLI represents the national significant number; the nature of address indicator shall be set accordingly. For the avoidance of doubt, point codes will need to be coordinated between operators and nationally in conjunction with the Regulator. The address presentation restriction indicator shall not contain the values “spare” or “address not available”.

1.4.5 Voice Signalling Procedure

1.4.5.1 All Traffic to national significant numbers shall use en-bloc-signalling mode of operation.

1.4.5.2 In case of overlap signalling mode of operation, an address complete message shall be sent as soon as all digits necessary to complete the Traffic are received.

1.4.5.3 Stop digits for indicating that the full number is transmitted shall not be used.

1.4.5.4 The required called party number format, nature of address, number length (range) and signalling mode of operation, as passed, between the Systems shall conform with the standards indicated below. Note that codes approved by the Regulator are mandatory.

Signalling

Called party number format	10 Digit – 592 NXX NNNN
Calling party number format	ITU E.164
Number length (range)	1-10 Digits

1.4.6 Signalling Quality of Service

1.4.6.1 The following quality of service levels for signalling availability on links for Interconnect are as follows:

1	Signalling Availability on Interconnection Links	≥ 99.9 %
2	Percentage of Severely Errored Seconds	≤ 0.055 %
3	Error Free Seconds	≥ 99.5 %

1.5 Traffic Handling of Services

1.5.1 Trunk Groups

1.5.1.1 Both Parties will undertake the routing/translation for all codes that require re-routing/re-translation across its System. However, all CLI and codes must comply with international and national standards.

1.5.1.2 Separate trunk groups per Service category identified in Annex B (Service Descriptions) or for a group of services will be agreed in writing, in advance of the provision of any Service.

1.5.1.3 All trunk groups shall be uni-directional.

1.5.1.4 The separate trunk groups between the GTT Point of Connection and the Telco Point of Connection shall be exchanged by the Parties in the form identified in Appendix 1.

1.5.2 Signalling Links

1.5.2.1 A minimum of two signalling links will be provided between the Telco System and the GT&T System, operating in a failover configuration.

1.5.2.2 Telco and GT&T will maintain equal loading of the signalling links.

1.5.2.3 GT&T and Telco will operate the signalling links in a redundant mode of operation.

1.5.2.4 The signalling links will be designed for a normal load of 0.2E and a maximum load of 0.4E following the guidelines of ETS 300 008.

1.5.2.5 The dimensioning of signalling links will be determined by the number of Call attempts using Erlangs formula.

1.5.2.6 This formula is applicable when signalling links are used for circuit related signaling; the number of links will be subsequently monitored, and adjusted, should this be necessary, according to specific traffic type.

1.5.2.7 The signalling links shall be used exclusively for the exchange of signalling messages.

1.5.3 Quality of Service for Access Services

1.5.3.1 The quality of service for Services described in Annex B (Service Descriptions) is represented by the following parameters: Call Availability, Dial Set-up Delay and Propagation Delay, each as defined below.

1.5.3.2 Depending on the Service, the Parties will have a role as:

- **Originating Party.** In this role, the Service Supplier handles Traffic from a Calling Party Customer in its originating System to the Point of Connection;

- **Transiting Party.** In this role, the Service Supplier handles Traffic from a Third Party Telecommunications Provider to the Service Supplier's Point of Connection with the other Party.

- **Terminating Party.** In this role, the Service Supplier handles Traffic from its Point of Connection to terminate through the terminating System to the Called Party.

1.5.3.3 For each quality of service parameter a value is defined.

1.5.3.4 Call Availability

1.5.3.4.1 The definition of "Call Availability" (%) is

$$100 * \frac{\text{(Total call attempts – total call releases with cause codes of network fault)}}{\text{(Total call attempts)}}$$

WHERE:
Time is in seconds and
Total time is the total seconds during a particular calendar month

1.5.3.4.2 Release causes marked as network Faults are the following causes specified in ITU-T rec. Q.850:

- no circuit/channel available
- network out of order
- temporary failure
- switching equipment congestion
- access information discarded

- requested circuit/channel not available
- resource unavailable, unspecified
- bearer capability not presently available
- protocol error, unspecified
- interworking, unspecified.

1.5.3.4.3 The Call Availability is > 99%. The apportionment for the Call Availability budget for Telco and GT&T is as follows:

Originating party	**Transit party**	**Terminating party**
≥99.6 %	≥99.8 %	≥99.6 %

1.5.3.5 Dial Setup Delay

1.5.3.5.1 "Dial Setup Delay" or ("DSD") is defined as the interval from the moment that the last digit of the called party number is keyed by the calling party to the time a relevant tone (ring tone/busy/information tone/message) is received by the calling party.

1.5.3.5.2 Dial Set-up Delay quality of service parameters are ≥ 1 sec and ≥ 6 sec for interior locations or ITU E400, whichever is greater.

1.5.3.5.3 The apportionment for the Dial Setup Delay value for Telco and GT&T is as follows:

Originating party	**Transit party**	**Terminating party**	**Database access if applicable**
575 ms	700 ms	575 ms	500 ms

1.5.3.6 Propagation Delay

1.5.3.7 "Propagation Delay" is defined as the round trip delay between the received signal and the transmitted signal.

1.5.3.8 The Propagation Delay quality of service parameter shall be no more than 22ms. Both Parties will take appropriate actions (such as echo cancellation, etc.) if this Propagation Delay parameter is exceeded.

1.5.3.9 The apportionment for the Propagation Delay budget for Telco and GT&T is as follows:

Originating PBX network if applicable	Originating party	Transit party	Terminating party	Terminating PBX network
5 ms	4.5 ms	3 ms	4.5 ms	5 ms

1.5.4 Calling Line Identity

1.5.4.1 All trunks for Interconnection will utilise Q.731 signalling through which the "Calling Line Identity" ("CLI") shall be passed transparently.

1.5.4.2 All numbers with CLI shall be transparent between Systems. Calling Number Delivery Blocking ("CNDB") shall be applied to all private numbers within the Telco System and GT&T System. Telco and the GT&T should ensure that CLIs associated with numbers with the CNDB are capable of termination in both Systems.

1.6 ITU-T Code References

G.703	"Physical/electrical characteristics of hierarchical digital interfaces"
G.711	"Pulse code modulation (PCM) of voice frequencies"
G.821	"Error performance of an international digital connection forming part of an integrated services digital network"
G.824	"The control of Jitter and wander within digital networks which are based on the 1.544 Mbit/s hierarchy".
O.171	"Timing Jitter measuring equipment for digital systems"
K.11	"Principles of protection against over voltage and over current"
K.42	"Preparation of emission and immunity requirements for telecommunications equipment"
K.43	"Immunity requirements for telecommunications equipment"
K.37	"Public Telecommunications network equipment EMC requirements Part I: Product family overview, compliance criteria and test levels"
UL 1950	"Standard for Safety for Information Technology Equipment, 3rd Edition"
G.111	"Loudness ratings (LRs) in an international connection"
G.113	"Transmission impairments"
G.703	"Physical/electrical characteristics of hierarchical digital interfaces"

G.704	"Synchronous frame structures used at primary and secondary hierarchical levels"
G.706	"Frame alignment and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in Recommendation G.704"
G.711	"Pulse code modulation (PCM) of voice frequencies"
G.811	"Timing characteristics of Primary Reference Clocks"
G.812	"Timing requirements of slave clocks suitable for use as node clocks"
G.813	"Timing characteristics of SDH slave clocks"
G.821	"Error performance of an international digital connection forming part of an integrated services digital network"
G.823	"The control of Jitter and wander within digital networks which are based on the 2048 Kbit/s hierarchy".
G.826	"Error performance parameters and objectives for international, constant bit rate digital paths at or above the primary rate"
G.841	"Types and characteristics of SDH network protection architectures"
G.921	"Digital sections based on the 2048 Kbit/s hierarchy"
G.957	"Optical interfaces for equipment and systems relating to SDH"
O.151	"Error performance measuring equipment operating at the primary rate and above"
O.171	"Timing Jitter measuring equipment for digital systems"
Q.522	"Digital exchange connections, signalling and ancillary functions"
ETS 300 008 (1991)	"Integrated Service Digital Network (ISDN); ITU-T Signalling System No.7; Message Transfer Part (MTP) to support international interconnection"
ETS 300 121	"Integrated Service Digital Network (ISDN); ITU-T Signalling System No.7; Application of the ISDN User Part (ISUP) of CCITT Signalling System No.7 for international ISDN interconnections."
ETS 300 356 -1 (1995)	"Integrated Services Digital Network (ISDN); Signalling System No.7. ; ISDN User Part (ISUP) version 2 for the international interface; Part 1: Basic services [ITU-T Recommendations Q.761 to Q.764 (1993), modified]."
ETS 300 356 -3 (1995)	"Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface; Part 3: Calling Line Identification Presentation (CLIP) supplementary service [ITU-T Recommendation Q.731, clause 3 (1993), modified]."
ETS 300 356 -4 (1995)	"Integrated Services Digital Network (ISDN); Signalling System No.7; ISDN User Part (ISUP) version 2 for the international interface;

Part 4: Calling Line Identification Restriction (CLIR) supplementary service [ITU-T Recommendation Q.731, clause 4 (1993), modified].

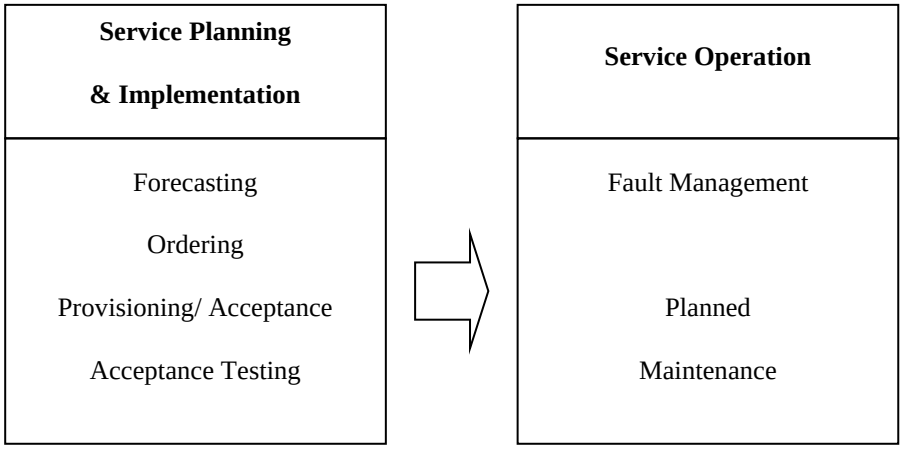
2. CHAPTER 2 - OPERATIONS AND MAINTENANCE

2.1 Operations and Maintenance: Introduction

2.1.1 This Chapter specifies the operations and maintenance principles that Telco and GT&T shall be required to conform from the Effective Date. It describes the processes for Services provided by each Party and the exchange of information between Parties. The specifications in this Annex D (Joint Working Manual) are applicable to both Parties' provision of Services. Only Services described in Annex B (Services) are available, even if described herein.

2.1.2 The following processes are covered in this Chapter.

Figure 2: Operational Processes



2.2 Roles and Responsibilities

2.2.1 Below are the functions, for both Parties, that are required to assure the effective management and execution of processes. These functions are described under sample roles, which may be arranged, combined, and managed at the sole discretion of each Party.

I. Liaison Manager

The Liaison Manager has overall responsibility for preliminary discussions regarding service planning, implementation, provisioning, and operational processes. Information should be exchanged between Liaison Managers, unless stated otherwise in this Joint Working Manual.

II. Operations Manager

The Operations Manager has responsibility for managing the day-to-day quality of Services, including operational processes.

III. Project Manager

The Project Manager has responsibility for the service planning, commissioning, testing and implementation for new and additional Services. The Project Manager will track the activities relating to forecasting, ordering, provisioning and testing and will keep the Liaison Manager abreast of related issues.

IV. Planning Manager

The Planning Manager has responsibility for forecasting and planning services and dimensioning of facilities for new and additional Services. Communications will generally be through the Project Manager to allow project coordination and monitoring.

V. Fault Control Manager

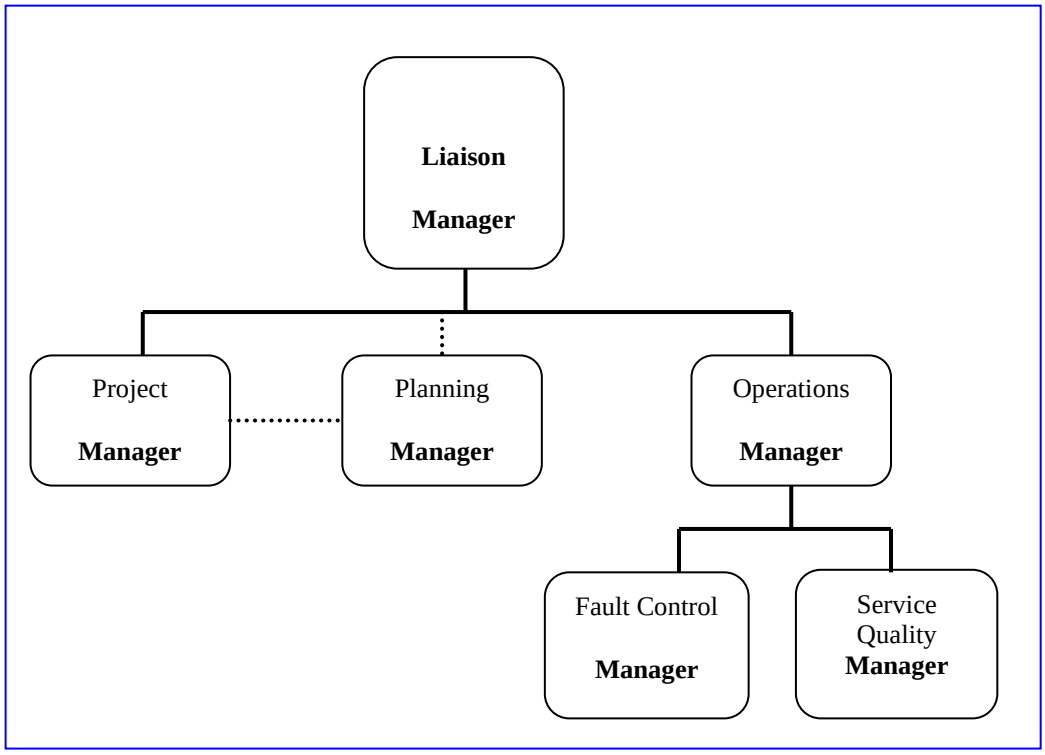
The Fault Control Manager has responsibility for managing Services and Network 24 hour, all days a year, and will own, identify and resolve relevant Faults.

VI. Service Quality Manager

The Service Quality Manager has responsibility for monitoring Service performance.

2.2.2 The relationship between the roles is illustrated in the Figure 3 below:

Figure 3: Operational Roles



2.3 Operational Meetings

2.3.1 Periodic meetings involving representatives from both Parties will be held once quarterly, unless the Parties agree that more frequent or infrequent meetings are required, to discuss the implementation and operation of Services provided pursuant to the Agreement. If a record of frequent performance failures or Faults is established, the Parties agree to hold monthly meetings to address the failures or Faults until such time as the Parties mutually agree failures or Faults have been addressed.

2.3.2 Service Implementation Meetings will include Forecasting Meetings, Order Planning Meetings, Provisioning Meetings, and Testing Meetings.

2.3.3 "Forecasting Meetings" will consider, *inter alia*, the Services Forecasts of both Parties and will seek to validate any assumptions used in making the Forecasts.

2.3.4 "Order Planning Meetings" will consider, *inter alia*, the final Forecast for each Party, and will lead to the production of an Order Plan.

2.3.5 "Provisioning Meetings" will, *inter alia*, review progress against plans and lead to agreement on any changes required.

2.3.6 "Testing Meetings" will, *inter alia*, review the process, the Test Suites, the Test Plan, and Service Acceptance. Any additional inter-operability testing that is required as a result of differences in standards or the introduction of new technology will also be included in the Testing Meetings process.

2.3.7 Additional technical meetings may be held prior to the provisioning phase to facilitate the early exchange of information regarding technical standards, the numbering scheme of each network, switch identification, routing etc.

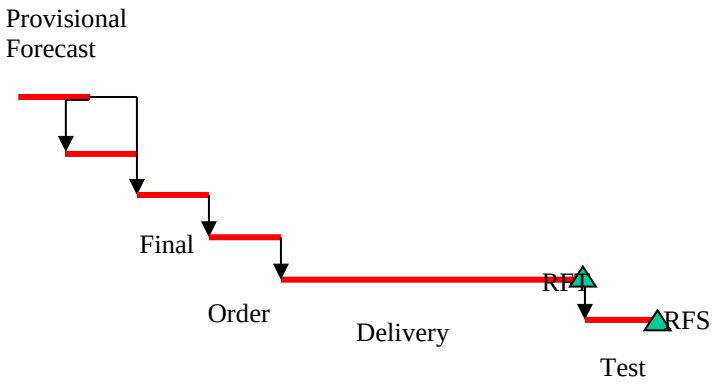
2.3.8 "Operational Meetings" will include discussions of, *inter alia*:

- review process performance by comparing actual and agreed quality of Service levels
- review operational problems that affect the quality of Service levels
- review of Interconnect Resolution Log
- agree on quality initiatives
- discuss performance reports (such as scheduled service interruptions and procedures to minimize disruptions)
- update the list of Fault Escalation contacts in Section V of Appendix 5

2.4 Service Implementation

2.4.1 The Service implementation process is shown graphically in Figure 4 below.

Figure 4: Service Implementation Process



2.4.2 The steps for Service implementation are as follows: a) provisional Forecast is exchange by the Parties, b) final Forecast is agreed, c) an Order Plan is exchanged by the Parties, d) a Service is delivered as ready for test ("RFT"), e) tests are conducted to ensure everything is ready for service ("RFS"). The stages in the sequence of the Service implementation are explained in more detail in the Paragraphs below in this Chapter.

2.5 Performance Reports

2.5.1 Written performance reports will be exchanged quarterly, and will include:

- Services that have been Forecasted and ordered, in the role of Service Taker, and Services that have been delivered in the role of Service Provider; and
- Service performance data.

2.5.2 The minimum set of items to be included in the performance report are shown in Appendix 2.

2.6 Interconnect Resolution Log

2.6.1 The resolution process is a mechanism for recording, tracking, and ultimately resolving interconnect issues, that have not been resolved within established time periods and through normal processes.

2.6.2 An Interconnect resolution log will be maintained to keep track of Interconnect Link issues and their status. This log (which will include the items set out in Appendix 1) will be maintained by the Parties and shall be reviewed at the Operational Meetings.

2.7 Disputes

2.7.1 In the event of any disagreement arising in respect of any technical matter in connection with this Agreement (other than technical matters in relation to Fault resolution prior to the exhaustion of the fault escalation procedure) (a "Technical Disagreement"), such Technical Disagreement shall in the first instance be referred to the Parties' respective Liaison Managers for resolution. In the event that the Liaison Managers shall fail to resolve such Technical Disagreement within thirty (30) days of the matter being referred to them, either Party may (i) refer the Technical Disagreement for determination by such person as the Parties may agree, whose decision shall be binding, or (ii) in the absence of such agreement, the matter shall be considered a Dispute and settled in accordance with the procedures set out in Section 41 of the Legal Framework. The Parties shall co-operate in such determination and will make all relevant information and technical data available.

2.8 Forecasting, Ordering, and Provisioning

2.8.1 Forecasting

2.8.1.1 The Forecasting process requires both Parties to plan and exchange Forecasts for each applicable Service provided pursuant to this Agreement, and to ensure that changes to the Forecasts are communicated in a timely fashion.

2.8.1.2 The exchange of Forecast information is required to enable each Party to plan and manage its System and human resources. The process is ongoing, requiring information from a rolling 24-month period provided in bi-annual updates.

2.8.1.3 Each Party shall have the opportunity to comment on the validity of provisional Forecast information during Forecasting Meetings, and to review any assumptions used. Each Party is encouraged to provide appropriate supplementary information to aid the development of Forecasts.

2.8.1.4 All information exchanged relating to Forecasts shall be treated as confidential, and will not be used for any purpose other than as set out in this Joint Working Manual.

2.8.1.5 Each Party shall provide a provisional Forecast for all Services that they require to purchase (in the role of Service Taker) from the other Party (in the role of Service Supplier) for the ensuing two-year period, to the extent known. This provisional Forecast will consist of the Interconnection capacity, as well as traffic Forecasts for all other Services provided pursuant to this Agreement. The form of the Forecasts are contained in Appendix 3.

2.8.1.6 The Parties will meet shortly the exchange of provisional Forecasts to agree on the Forecast data; such agreed Forecast data will be called the "Final Forecast" and will include the combined provisional Forecasts of both parties (with any agreed amendments). For the first calendar year following execution of the Agreement, if the Parties do not reach agreement on a provisional Forecast despite diligent good faith efforts, the Parties shall agree on Forecast data in relation to the following month, which shall become the Final Forecast.

2.8.1.7 The review of provisional Forecasts and production of the Final Forecast, should take no longer than one month.

2.8.1.8 The Forecasting process requires both Parties to plan and exchange Forecasts for each applicable Service provided pursuant to this Agreement, and to ensure that changes to the Forecasts are communicated in a timely fashion.

2.8.2 Ordering

2.8.2.1 The Parties shall agree to an Order Plan for each Quarter at an "Ordering Meeting" and, following sign-off by both Parties of the Order Plan, the Order Plan shall be treated as submitted and shall constitute a binding Order Plan from each Party for capacity. The relevant Final Forecast will be an integral component of the Order Plan. The form of the Order Plan is given at Appendix 4.

2.8.2.2 The Order Plan will include a Ready for Test ("RFT datae and RFS") date and a Ready for Service ("RFS") for any increased capacity. These dates will depend on the nature of the additional capacity requirements, and will be agreed between the Parties on a case by case basis. For the avoidance of doubt, since the Order Plan will be based on the Final Forecast, it will represent an order for capacity in both directions.

2.8.2.3 The Order Plan will not be required to include a requirement for any specific use for any specific Service.

2.8.2.4 The RFT date and RFS date may be subject to Force Majeure Event circumstances, including delays caused by Third Parties, or delays caused by the Service Taker not complying with its obligations, providing insufficient or inaccurate information or not cooperating with the Service Provider. In the event of any delay attributable to a Force Majeure Event circumstance or by events and delays caused by the Service Taker, the RFT date and/or RFS date shall be deemed extended by the number of days of delay and the Service Provider shall not be liable therefore.

2.8.2.5 In the event that either Party shall notify the other that it wishes to cancel any capacity specified in an Order Plan (whether prior to or following provisioning), the notifying Party shall be required to Terminate that Service under any relevant provisions of this Agreement.

2.8.2.6 In the event that a Party determines that capacity specified in an Order Plan is insufficient to meet actual traffic volumes and meet the quality of service measures stated in this Joint Working Manual, then that Party shall promptly notify the other Party, and if the other Party agrees that capacity is insufficient, then the Parties shall: (i) establish a plan to increase capacity, including any agreed upon modifications to the RFT dates or RFS dates necessary to meet the actual Traffic volumes and quality of service measures in this Joint Working Manual; (ii) identify the applicable Charges associated with such plan and modifications; and (iii) in cases where the lack of sufficient capacity has been caused by one Party's rejection of bona fide Forecasts made by the other Party in good faith, and without compromising the general principle that the Party ordering additional capacity must pay any relevant up-front Charges, negotiate in good faith the allocation of costs to be borne by each Party, including but not limited to sharing of those costs by the Parties.

2.8.3 Provisioning

2.8.3.1 After the submission of the Order Plan, both Parties shall carry out the necessary preparations required for installation of the Services.

2.8.3.2 The Parties will use their reasonable endeavours to perform all activities to ensure that the facilities and telecommunications Equipment are in place to meet the agreed RFT date and RFS date.

2.8.3.3 If a Party envisages a delay to the RFT date or RFS date, it will inform the other Party in writing within twenty-four (24) hours of obtaining knowledge thereof, clearly indicating the reasons for the delay and any proposed revised RFT date or RFS date, and the Parties shall seek to agree a revised date.

2.8.3.4 Both Parties shall seek to minimise delay and the effects of delay.

2.8.4 Acceptance Testing

2.8.4.1 The Acceptance Testing process requires both Parties to ensure that all required E1 Interconnection Links, and any applicable Services, are operational by the agreed RFS date (or other agreed date) to the agreed operational specifications and at the lowest practicable cost.

2.8.4.2 Plans for Acceptance Testing will be included in the Order Plan and shall consist of the standard suite of tests in accordance with this Joint Working Manual.

2.8.4.3 If a subset of the standard suite of tests is to be used, it must be agreed by both Parties on a case-by-case basis. The Parties shall co-operate fully in the performance of acceptance tests.

2.8.4.4 The two Parties shall jointly develop a test plan in accordance with this Joint Working Manual. The test plan shall include all required tests to be performed at specified intervals throughout the implementation of the Order Plan and the contact names and telephone numbers of representatives of both Parties.

2.8.4.5 Both Parties shall sign the Test Plan at least one month before the expected start of Acceptance Testing. Any delay in signing the test plan may result in a consequential delay of all previously scheduled implementation dates.

2.8.4.6 Prior to the scheduled RFT date (or other agreed date), Interconnection Links, signalling links to be used during Acceptance Testing must be in place and individual location tests must have been successfully completed.

2.8.4.7 At least five (5) Business Days before the scheduled RFT date (or other agreed date), the Service Provider shall advise the Service Taker whether the provisioning has been completed and Acceptance Testing can commence.

2.8.4.8 All Acceptance Test results will be recorded in a test report in accordance with this Joint Working Manual and both Parties will retain copies for future reference.

2.8.4.9 If the Acceptance Testing is successful, each Party will sign the acceptance test reports within two (2) Business Days of completion.

2.8.4.10 If Acceptance Testing is unsuccessful within the initially agreed time frame, the Parties may agree on a partial Acceptance Testing, with the understanding that full compliance will be met by an agreed date.

2.8.4.11 If either Party does not accept the links the Acceptance Testing, then the reasons for non-acceptance should be documented and the report signed indicating non-acceptance. The Parties will agree what action should be taken, including any timeframe for remedial work and re-testing. Any Technical Disagreements or Disputes will be resolved in accordance with the terms of this Agreement.

2.8.4.12 The details of the Test Suites are presented in Chapter 3 of this Joint Working Manual.

2.8.5 Fault Management

2.8.5.1 The Fault management process adopted by both Parties shall ensure the prompt restoration of agreed quality of Service. The level of detail for reporting Faults will be agreed in advance of Service activation by the two Parties and will be reciprocal.

2.8.5.2 The Fault management process adopted by both Parties shall ensure the prompt restoration of agreed quality of Service.

2.8.6 Fault Classification

2.8.6.1 Faults will be generally classified as follows:

- "System Fault": A Fault resulting in the total loss of ability by either Party to transmit Calls between the two Systems due to transmission faults on the E1 Interconnection Link or an entire System;

- "Network Fault": A Fault located within the Telco System (Telco Network Fault) or within the GT&T System (GT&T Network Fault). Network Faults include Faults within the signalling networks.

2.8.6.2 Faults will be addressed depending on individual circumstances, with Service Affecting Faults having the higher priority:

2.8.6.3 "Service Affecting Faults" ("SA Faults") mean a Faults that result in a noticeable deterioration in the quality of service according to the classifications defined in Section 2.8.6.5 below, and for which the Fault Reporting Party can demonstrate:

- severely restricted ability by either Party to convey Calls between the two networks; or

- total loss of, or severely restricted access to one or more of the Services provided through the other Party's System; or

- total loss of, or severely restricted access to Services provided through a Third Party Telecom Provider's System, where the Calls are transited via either Party's System; or

- a loss of Service deemed as "business critical" by either Party.

2.8.6.4 "Non Service Affecting Faults" ("NSA Faults") means a Fault which is not a Service Affecting Fault.

2.8.6.5 Each Fault will be classified as Critical Link Failure, Major Link Failure, and Critical Route Failure, Major Route Failure, and Minor Route Failure, each of which are classified as follows:

Fault type	**Classification**
Critical Link Failure	*100% of total signalling capacity is unavailable*
Major Link Failure	*50% of total signalling capacity is unavailable*
Critical Route Failure	*50% or more of total capacity of the route is unavailable to carry traffic.*
Major Route Failure	*25% to < 50% of total capacity of the route is unavailable to carry traffic*
Minor Route Failure	*1% to < 25% of total capacity of the route is unavailable to carry traffic*

2.8.6.6 Each Party is required to provide Fault reporting and Fault management. Each Party should operate monitor the Services and Systems twenty-four (24) hours per day, seven (7) days per week and all days per year, and each Party should have specified contact numbers for Fault reporting and Fault management.

2.8.6.7 Either Party can report a Fault. Each Party will maintain a unique set of Log Numbers for Faults. When one Party reports a Fault to the other, the Parties will exchange Log Numbers for Faults.

2.8.6.8 Both Parties will exchange sufficient information to allow for efficient Fault resolution of all affected Services. A standard Fault management will be used by both Parties to report and receive Faults, in the form of Appendix 5.

2.8.6.9 Each reported Fault will be investigated by the reporting Party to ensure that the Fault exists and to attempt to establish the location of the Fault.

2.8.6.10 For internally detected Faults, i.e., where a Party believes a Fault exists within its own System, the Party will inform the other Party about any such Faults which are Service Affecting Faults. This also applies to known Service Affecting Faults in a connected Third Party Telecommunications Provider's System.

2.8.7 Fault Restoration

2.8.7.1 The stages associated with Fault restoration are presented in Figure 5:

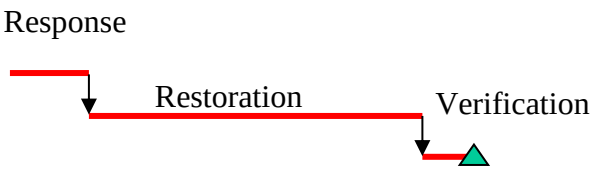


Figure 5: Fault Restoration Process

2.8.7.2 If, during a Fault restoration, it is established that the Fault is in the System of the other Party, then the roles will be reversed.

2.8.7.3 A Fault is classified as cleared when the Party with the Fault informs the other Party that the Fault has been rectified and the other Party has verified this.

2.8.7.4 The Fault response time (maximum thirty (30) minutes) is the period in which:

- The Parties agree as to responsibility for the Fault
- The Fault priority is determined; whether Fault is Service Affecting or Non Service Affecting. If there is no agreement, then by default the Fault is classified as Service Affecting; and
- The Party with the Fault specifies expected Restoration Time.

2.8.7.5 The Restoration Time is the period in which:

- Party with the Fault clears the Fault;
- Party with the Fault informs the non-Fault Party of progress and when the Fault is cleared.

2.8.7.6 Fault Restoration Times are specified in the Appendix 6.

2.8.7.7 The Verification Time (maximum fifteen (15) minutes) is the period in which the non-Fault Party reports its acceptance or rejection of the Fault clearance to the Party with the Fault.

2.8.7.8 Disrupted Services may be restored promptly on a temporary basis, to be followed by permanent Fault resolution at a later date. This form of Fault resolution shall only be used when the temporary resolution costs are considered by the Party with the Fault to be reasonable.

2.8.7.9 At any time during the resolution of a Fault, the non-Fault Party may, with sufficient documented justification, request the change in status of the Fault from a Non Service Affecting Fault to Service Affecting Fault, at which point the Fault Restoration Time will be reviewed. Similarly, the Party with the Fault may also request a change in status of a Fault from a Service Affecting Fault to a Non Service Affecting Fault with the required documented justification.

2.8.7.10 If for any reason a resolution of a Fault is impeded, due to the non-Fault Party, the Party with the Fault may, with proper documented justification, suspend the measurement of the Fault Restoration Time.

2.8.7.11 Fault escalation can be instigated when:

- the non-Fault Party raises concerns about the speed of resolution; or

- when the Party with the Fault requires greater cooperation from the non-Fault Party; or

- when the target Fault Restoration Time, as stated in the Appendix 6, has elapsed without Restoration.

2.8.7.12 Initiation of the escalation process shall be done by phone, fax or other agreed media. Documented records must be kept of the entire escalation process.

2.8.7.13 Every effort shall be made by both Parties to reach agreement at each escalation level before proceeding to the next level.

2.8.7.14 The Parties can agree on set escalation deadlines for specific circumstances.

2.8.8 Planned and Emergency Maintenance

2.8.8.1 "Planned Maintenance" consists of the following:

- work that affects, or has the potential to affect the System or its underlying E1 Interconnection Links or their quality of Service; or

- work that affects, or has the potential to affect the quality of Service provided to a Subscriber; or

- work that affects, or has the potential to affect the quality of Service provided by the other Party's System.

2.8.8.2 The Party planning to carry out a Planned Maintenance activity (the "Maintenance Party") should provide at least ten (10) Business Days' notice to the other Party.

2.8.8.3 If the other Party determines that the Planned Maintenance has the potential to affect its Services adversely, then it should contact the Maintenance Party within five (5) Business Days of the first notice, with a view to negotiating a mutually agreed date for Planned Maintenance activity.

2.8.8.4 Both Parties must be in possession of the final schedule for Planned Maintenance at least three (3) Business Days before the commencement of the Planned Maintenance activity. If an agreement cannot be reached within this time frame, then the escalation procedure for Faults described above should be applied.

2.8.8.5 "Emergency Maintenance" is a type of maintenance work that needs to be carried out immediately due to the impact or potential impact to the Parties' System or services. If this work affects, or has the potential to affect the other Party's Services, then, as much advance notice will be given as the situation permits.

2.8.9 Miscellaneous Operations and Maintenance Procedures

2.8.9.1 Procedure for Number Alteration:

2.8.9.1.1 Each Party will notify the other in writing of any alterations to the number ranges (or numbers) to which Traffic are to be conveyed pursuant to the Service. The date on which such notification is deemed to be received will be the date of receipt for purposes of alterations to the number ranges (or numbers).

2.8.9.1.2 Within three (3) Business Days of date of receipt, each Party will notify all interconnected Third-Party Telecommunications Providers of any alterations to the number ranges (or numbers).

2.8.9.1.3 Each Party will perform the necessary alterations to its respective Systems to facilitate the alteration to the number ranges within five (5) Business Days of date of receipt of notice, and will inform the other Party of completion of the necessary alterations within one (1) Business Day of completion the necessary alterations.

2.8.9.1.4 The Parties will cooperate in order to conduct any necessary testing for alterations to the number ranges (or numbers), where applicable, and will use all reasonable endeavours to complete such testing within five (5) Business Days of alteration.

2.8.9.2 Procedure for Directory Number inclusion and Publication Service

2.8.9.2.1 The Parties will provide information for Directory Number and Publication Service in an ASCII (plain) text files in the form: <GT&T name><date>DQ FILE.DAT, with date in the format: mmddyy. [e.g. Celstar050303 DQ FILE.DAT].

2.8.9.2.2 The cut-off dates for submission of data will vary each year; the Parties will advised each other sufficiently in advance.

3. CHAPTER 3 – TESTING

3.1 Interconnect Testing - Objectives & Scope

3.1.1 This Chapter specifies the processes related to testing applicable to the Services provided between the Parties for Services described in Annex B (Services). Only Services described in Annex B (Services) are available even if described herein.

3.1.2 The objectives of the testing are:

- to maintain the integrity of both Systems
- to meet the contractual specifications
- to locate and enable resolution of Faults with the Interconnect;

- to ensure that billing is completed correctly.

3.1.3 The chapter describes:

- process to support the testing
- project plan to support the testing
- roles and responsibilities
- phases of testing with entry and exit criteria
- detailed test cases
- results sheets
- how to manage a test failure

3.2 Interconnect Testing Framework

3.2.1 The following general framework is to be used to support Interconnect testing.

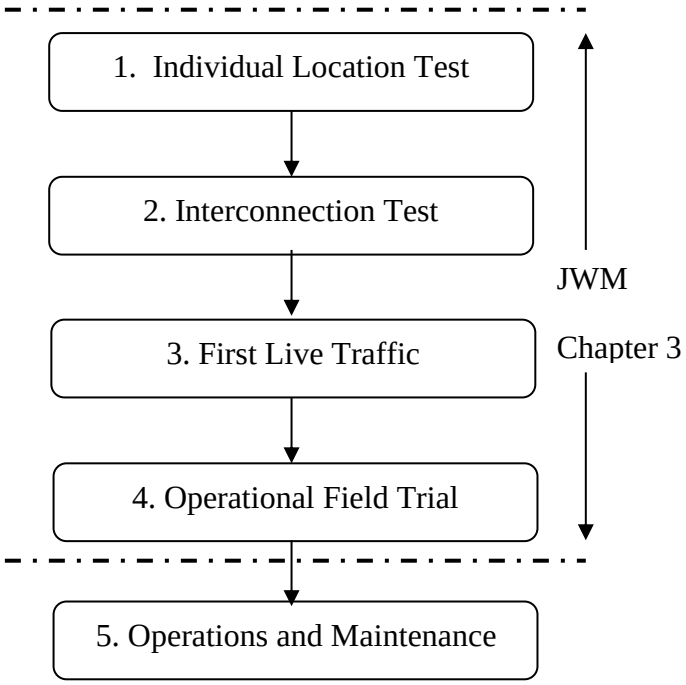


Figure 6: Interconnection Testing Processes

Individual Location Test ("ILT")	This phase of the testing verifies that the network of Telco and the GT&T are suitable to interconnect. Each Party must demonstrate that its interface conforms to the requirements of the Joint Working Manual.
Network Interconnection Test ("NIT")	The Network Interconnection Test ensures the interoperability of the Systems, management of the Interconnect Links, tests whether all types of Calls can be made and includes CCSS7 tests and exchange of CDR records.
First Live Traffic ("FLT")	This is the first trial of the interconnect in a test field environment with limited non-billable traffic. This phase considers maintenance and fault handling procedures, and verifies that the correct bills are delivered. It also tests that the roles and responsibilities are clear.
Operational Field Trial ("OP")	This is the phase prior to the general operation of the interconnection. During this phase, fine-tuning of operational procedures takes place. All functions must be verified including start-up/shut-down procedures, disaster recovery, security, and performance under severe load. This phase uses non-billable and billable traffic depending on the test.

Figure 7: Interconnection Testing Process Definitions

3.2.2 The Interconnection testing framework will be performed in test phases, as shown below in Figure 8. Each of the test phases will follow the same structure to derive and document the tests.

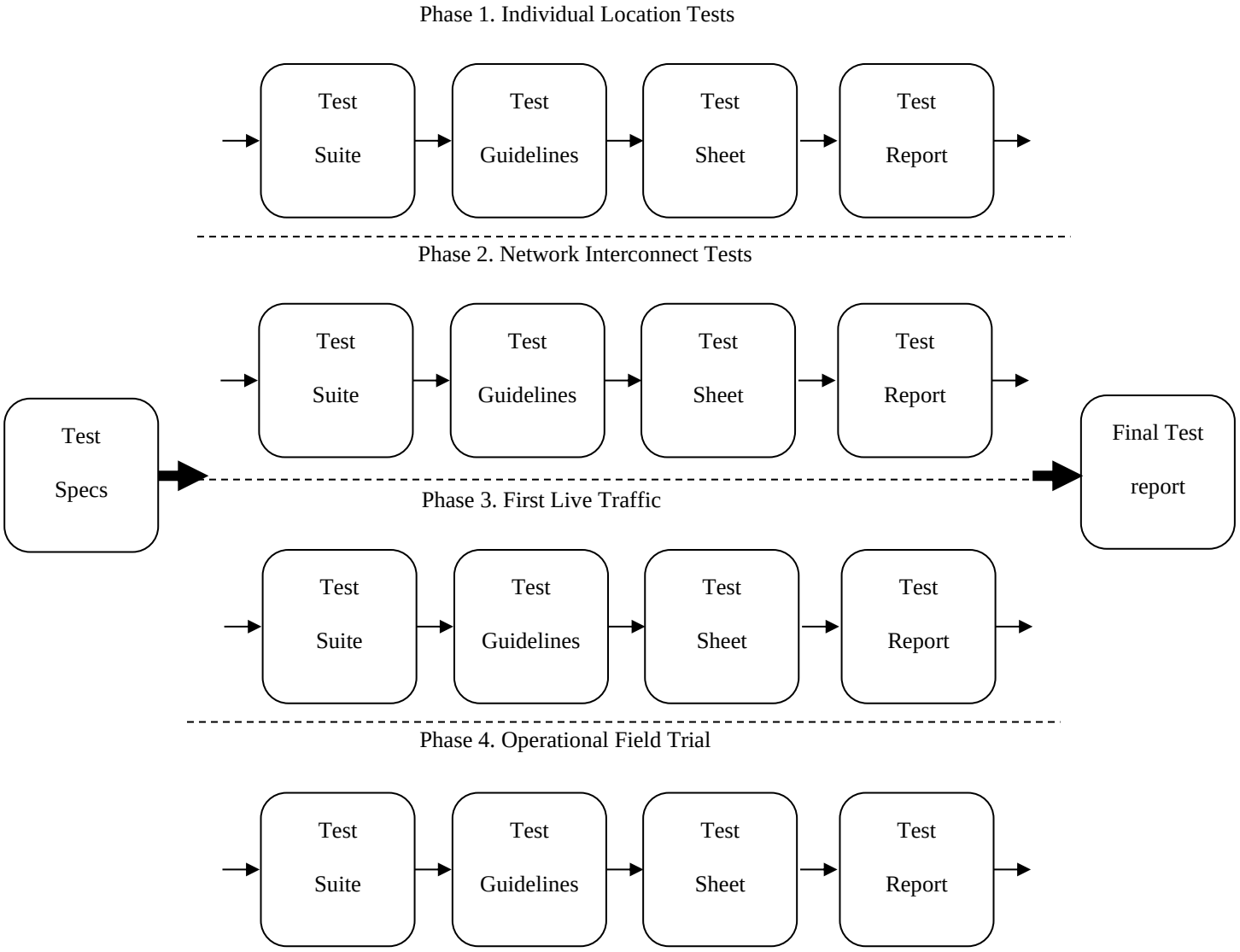


Figure 8: Interconnection Testing Phases

3.3 Test Phase Specifications for Testing

3.3.1 Test Phase Specifications: The Test Phase Specification contains the total set of Test Suites and Test Guidelines agreed between both parties to support the testing. Key terminology relating to the Test Phase Specification is defined below.

3.3.1.1 "Test Suite": The Test Suite is a set of defined Test Guidelines that relate to a particular functionality e.g., billing, inter-operability. A Test Suite can be tested in whole or in part against any of the four test phases.

3.3.1.2 "Test Guidelines": The Test Guidelines contain:

- list of all the test cases to be completed
- justification for test cases
- detailed test case procedures
- test case pass/fail criteria
- details of other test data to be recorded
- planning to co-ordinate and track the testing progress.

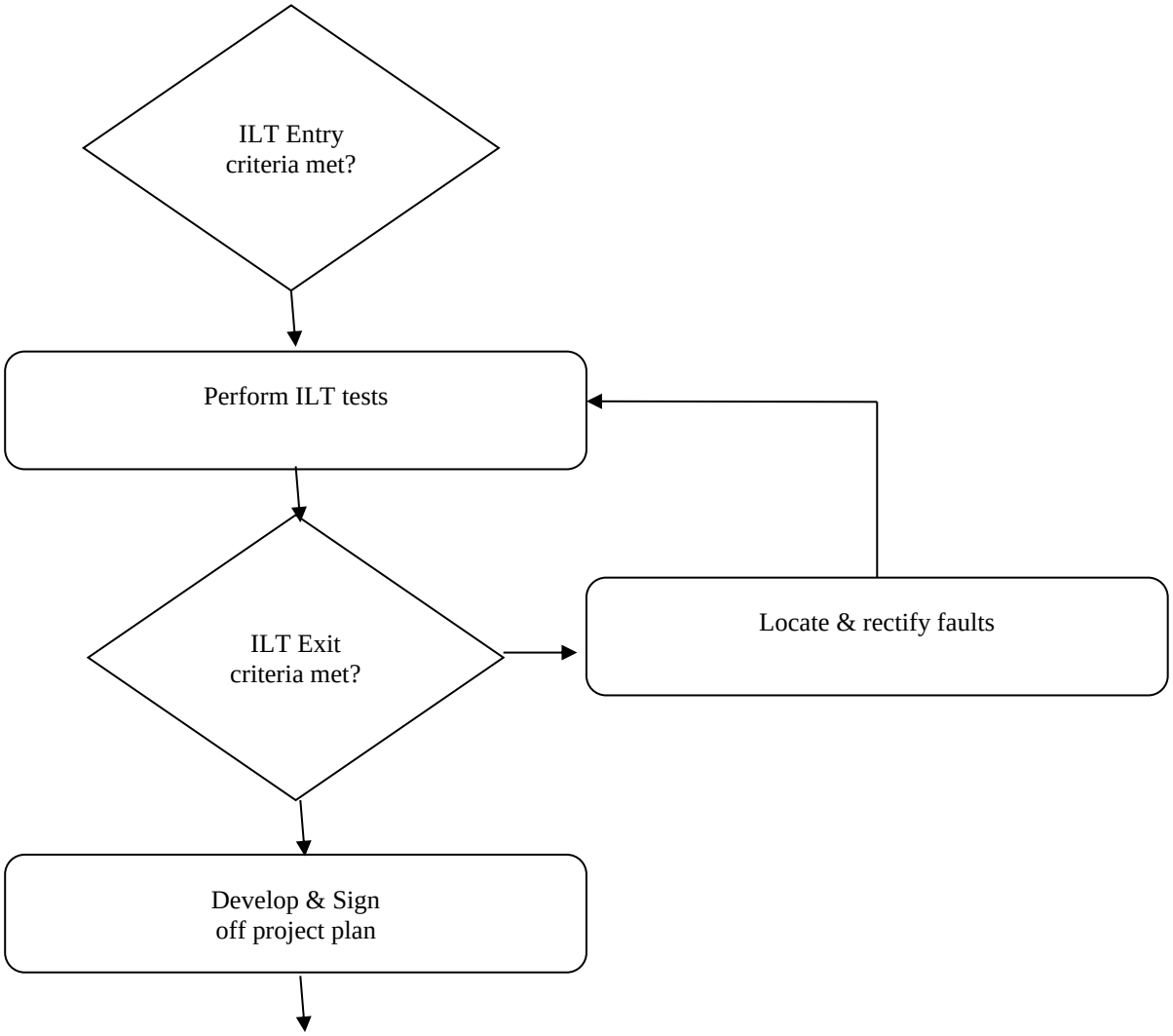
3.3.1.3 "Test Sheet": The Test Sheet contains an accurate record of the test completed and the outcome of the test.

3.3.1.4 "Test Report": The Test Report is a summary of the tests executed. It also provides details on faults, re-tests and exceptions. The Test Report is signed by both parties and is proof that the testing was completed. It is the main input to deciding whether the current phase of work can be exited.

3.3.1.5 "Final Test Report": Final Test Report is compiled at the end of all the testing and highlights any outstanding faults, issues and concerns. It is the main input into deciding whether the Interconnect is ready to become fully operational.

3.3.2 Individual Location Test

3.3.2.1 Individual Local Test Workflow Process



3.3.2.2 The goal of the Individual Local Test is to determine whether the infrastructure of each Party exhibits sufficient functionality to support an Interconnect. The tests consider the following areas:

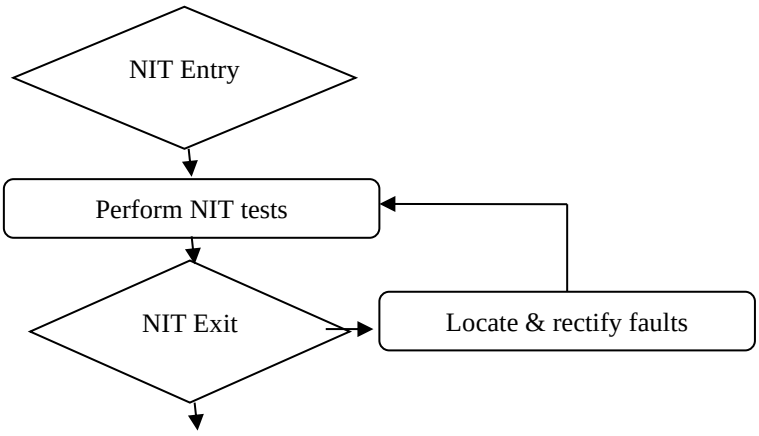
- Conformance to relevant communication standards and technical specifications as described in the technical chapter
- Implementation of the charging mechanisms
- Charging calibration.

3.3.2.3 Each Party performs its own Individual Local Test. If either Party fails the testing, the Interconnect cannot proceed until the fault(s) have been corrected. Each Party is responsible for correcting any Faults, and carrying out any modifications or additions to its own interconnect equipment to rectify the situation.

Entry Criteria	Signed Order Plan / agreement on the connection; Test Guidelines completed for this phase; Each Party has sufficient resource available to complete this phase of testing; Provisional project plan drafted.
Exit Criteria	Each Party has completed Individual Location Test and passed all tests; List of known deviations and imperfections available; No known fatal, inadmissible or major faults; Test results made available to each party; Test Report is approved and signed by both parties.

3.3.3 Network Interconnection Test

3.3.3.1 Network Interconnection Test Workflow Process



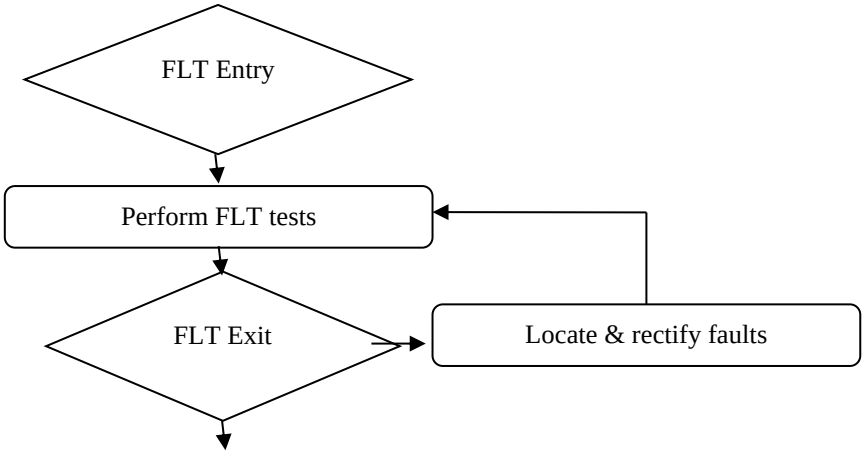
3.3.3.2 This phase of testing minimises operational risk for both Parties. The Network Interconnection Test consider the following areas:

- Interoperability of the signalling traffic
- Checking whether charging mechanisms of both Parties are in line.

Entry Criteria	Project plan, documented and signed by both Parties; List of known deviations and imperfections available; Test guidelines have been completed for this phase; Both Parties have sufficient resource available to complete this phase of testing; The interconnection between Telco's Point of Connection and GT&T's Point of Connection is ready for this phase of testing.
Exit Criteria	Successful completion of the Network Interconnection Tests; No known fatal, inadmissible or major faults; Planned solution for all faults has been documented; Test results made available to each party; Test Report is approved and signed by both parties.

3.3.4 First Live Traffic

3.3.4.1 First Live Traffic Workflow Process



3.3.4.2 The First Live Traffic determines whether the Systems of both Parties are correctly interconnected. In addition to testing the basic Interconnect, billing and supporting processes are tested during the First Live Traffic tests.

3.3.4.3 No billable traffic should be used during this phase of the testing.

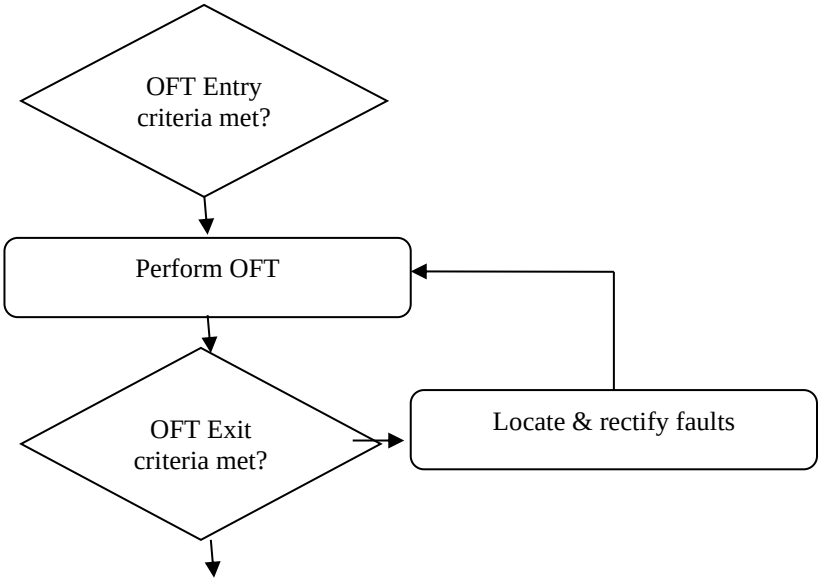
3.3.4.4 The First Live Traffic tests consider the following areas:

- Interoperability of signalling traffic
- Service tests (can all types of calls be established)
- Routing tests (is the GT&T or Telco System reachable from all locations)
- Whether charging mechanisms of both Parties are in line
- Bill test (on basis of CDRs from test traffic)
- Process test (e.g. maintenance and error procedure).

Entry Criteria	List of known deviations and imperfections available; Both Parties have sufficient resource available to complete this phase of testing; The interconnection between Telco's Point of Connection and the GT&T's Point of Connection is fully installed and operational; List of known deviations and imperfections available; Test Guidelines have been completed for this phase; O&M procedures are available.
Exit Criteria	Successful completion of the First Live Traffic tests; No fatal, inadmissible or major faults are present, and calls are billed accurately; Planned solution for all faults has been documented; Test results made available to each Party; Test Report is approved and signed by both Parties .

3.3.5 Operational Field Trial

3.3.5.1 Operational Field Trial Workflow Process



3.3.5.2 The Operational Field Trial is the phase prior to general availability of the Interconnection. During the Operational Field Trial all outstanding faults from previous test phases have to be resolved. During this phase billable traffic is passed for the first time. The objective of this Trial is to ensure that the operational and maintenance procedures are effective to deal with any issues that will arise.

Entry Criteria	No changes in the interconnection since conclusion of the previous phase of testing; List of known deviations and imperfections available; Test Guidelines completed for this phase; Both Parties have sufficient resource available to complete this phase of testing.
Exit Criteria	No faults are present; Support for further Field introduction is available; Performance and stability statistics are within the limits defined in the contractual agreement, and calls are billed accurately; Applicable O&M procedures approved; Test results made available to each Party; Operational Field Trial Test Report is approved and signed by both Parties; Final Test Report is approved and signed by both Parties.

3.3.6 Test Sheets and Test Report

3.3.6.1 The Test Sheets contain the results of executed tests for each test phase. These results can be positive (passed), or negative (failed), and where applicable additional information may need to be recorded.

3.3.6.2 For each phase of testing a test report must be completed. In all cases the Test Report should be completed and signed by both Parties. The Test Report should at a minimum reflect what tests have been performed, whether the result was as expected or if deviations were observed.

3.4 Test Suites

3.4.1 The Interconnect Test Suites required are shown below. Within each Test Suite there are key areas of testing, which are shown below. Agreement to this needs to be confirmed through the Project Plan and then further detailed in the Test Guidelines.

	Test Suites	**Tests Phases**			
		ILT	NIT	FLT	OP
1	Conformance tests: 1. Protocol conformance 2. Electrical conformance 3. EMC conformance 4. Local Operation Tests	 X X X X			
2	Interoperability tests: 1. End to end transmission 2. Network Synchronisation 3. CCSS7 signalling 4. Network routing 5. Network management		 X X X X X	 X X X X	 X X X X
3	Stability and Security tests: 1. Load tests 2. Stress tests (fault situations) 3. Fraud	 X	 X X X	 X X	
4	Service tests: 1. Services from Service Provider to Service Taker 2. Changed services 3. New services			 X X	 X X X
5	Billing: 1. Charging calibration 2. Charging per service (CDRs) 3. Billing aggregates 4. Billing service	 X	 X X	 X X X X	 X X X X
6	Processes: 1. Service & Element management 2. Operation processes 3. Maintenance processes 4. Customer processes			 X X X X	 X X X X

3.4.1.1 The Test Suites are described in overview below.

3.4.2 Conformance Testing

3.4.2.1 The Test Suite confirms that the protocol supported meets the technical specification through conformance testing. Conformance Testing deals with the behaviour of the protocol, and not with processing capacity under critical load conditions. It may also address invalid behaviour testing.

3.4.3 Interoperability Testing

3.4.3.1 An Interoperability test involves at least two networks which are interconnected. In these tests it is verified whether elements of a procedure (including parameters) across the common boundary, are in compliance with the specification. The Test Sequences across the point of observation are not generated or inserted at the point of observation itself, but at interfaces contained within the systems under test.

3.4.4 Stability and Security Test

3.4.4.1 Stability tests consist of load and stress tests. Load tests are tests of the interconnection in situations of relatively heavy use. Stress tests are tests in which fault situations are introduced in the interconnection. The point of observation is the common boundary between the interconnected systems. In both tests it should be verified that the interconnection works under extreme circumstances. Network fraud testing is included in this test suite.

3.4.5 Service Test

3.4.5.1 These tests ensure the services supplied by either Party will operate in a manner that is compliant with the Service Descriptions and technical characteristics.

3.4.6 Billing

3.4.6.1 Billing verifies that the charging mechanism (based on CDR generation) supported by both parties is accurate and meets the agreed specification.

3.4.7 Processes

3.4.7.1 Process tests involve the testing of operation, maintenance and customer processes. They also include documentation, training of personnel and support of the interconnection. In some of these areas an actual test case cannot be written to test a process and the relevant people, as part of the exit criteria, will review the process.

3.5 Testing Fault Procedure

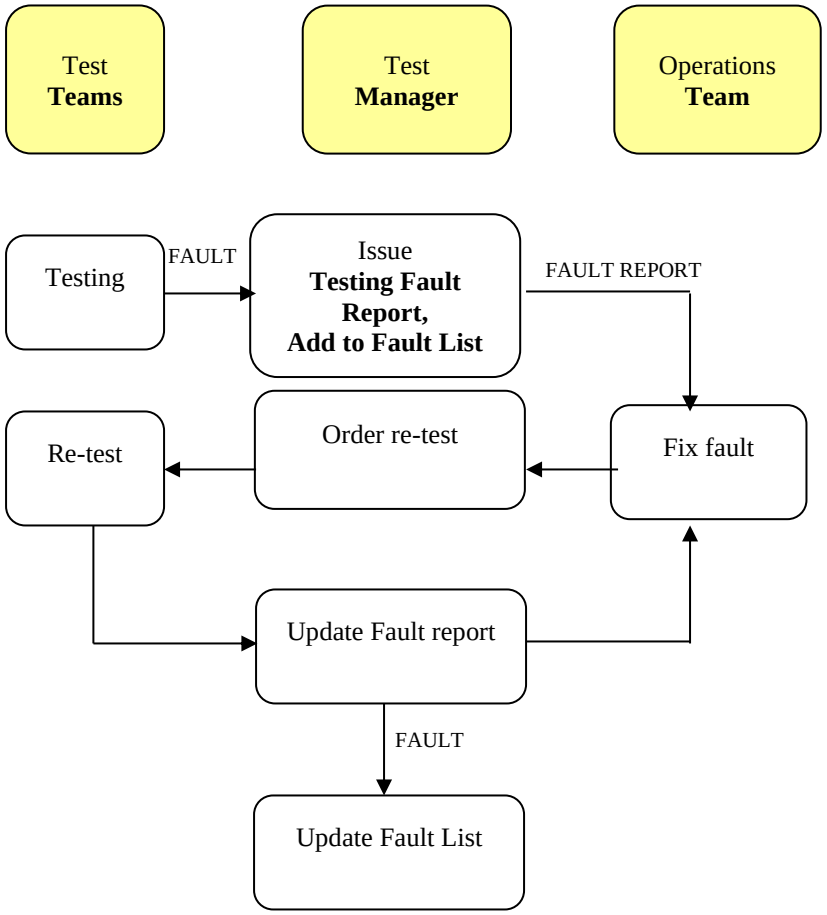
3.5.1 If a Testing Fault is identified in a testing phase it should be registered and the test manager for the phase informed. The Testing Fault will then be classified, passed on to the installation / development team and resolved. When the Testing Fault is resolved the new implementation may need to be tested again and the result recorded. When the retest is successful, the Testing Fault can be closed on the Fault list that the test manager controls.

3.5.2 The test teams of either party can detect faults. The test manager for the corresponding test phase will issue a Testing Fault report in the format set out in Appendix 5 and register it on the Testing Fault list in the format set out in Appendix 5. The Testing Fault report shall include Testing Fault classification. The classification is defined by mutual agreement between the test managers. If there is a conflict about the classification, the Overall Test Managers will be consulted.

3.5.3 The Testing Fault report and fault list will use the same numbering convention so that a fault number will relate to only one specific testing Fault throughout the end to end Fault Resolution process. The numbering convention consists of x.y. Where x indicates the phase number when the Fault was identified, and y is a number allocated to identify the Fault, starting at one.

Phase Name	**Phase Number (ie x.y)**
Individual Location Tests	1.y
Network Interconnection Tests	2.y
First Live Traffic	3.y
Operational field trial	4.y

3.5.4 The operations and development team is responsible for resolving the Testing Fault. Once the Testing Fault is resolved the team updates the Testing Fault report with details of the solution. If the Testing Fault is solved before the end of the related test phase, the test manager organises a retest, otherwise the Overall Test Manager should arrange a retest. When the retest is successful the Testing Fault report can be closed. If the retest is not successful, the Testing Fault is sent back to the operations and development team. .



3.5.6 Testing Fault Classification

3.5.6.1 There are five categories to which a Testing Fault can be allocated during testing. A Testing Fault must always be allocated to one of these categories and for each Testing Fault it should be determined which operator will take responsibility for resolving it. Corrections of the Testing Faults should be made within the time agreed for each fault category.

Testing Fault Category	**Repair Time**
Fatal	Immediately
Inadmissible	3 days
Major	4 weeks
Minor	before Operational Phase
Imperfections	before general availability

3.5.6.2 Fatal Testing Faults

3.5.6.2.1 A Testing Fault is classified ‘fatal’ if this Testing Fault causes a situation in which it is not possible or useful to continue testing.

Fatal Testing Faults have a significant impact on the test schedule, as all test activities will be stopped until the Testing Fault is rectified. Fatal Testing Faults therefore need to be fixed immediately.

3.5.6.3 Inadmissible Testing Faults

3.5.6.3.1 Inadmissible Testing Faults are Testing Faults which are not allowed in the operational phase but can be allowed in a test phase. Although a test phase can be continued if such a Testing Fault occurs, the solution for the Testing Fault has to be available within 3 days unless otherwise agreed.

3.5.6.4 Major Testing Faults

3.5.6.4.1 Major Testing Faults affect the quality of the service in operational status. After a major Testing Fault has been detected, the solution for the problem has to be available within four weeks unless otherwise agreed.

3.5.6.5 Minor Testing Faults

3.5.6.5.1 Minor Testing Faults also affect the quality of a service in an operational situation. However these Testing Faults are not perceived by an end-user and are less urgent to resolve. Both parties need to determine the period of time in which the solution for these Testing Faults need to be made available/ deployed and must be completed by at least the start of the operational phase.

3.5.6.6 Imperfections

3.5.6.6.1 Imperfections are all Testing Faults that do not affect the Quality of Service. The Testing Faults must be solved before general availability. Depending on the possibility, the solution may be covered in future upgrades.

3.5.7 Where there are issues concerning Testing Fault classification and/or the cause of the Testing Fault, the Overall Test Managers should be consulted.

3.5.8 Testing Faults have to be documented in the corresponding test reports and handled as described in the previous section.

3.6 Additional Roles and Responsibilities for Testing

3.6.1 The Service Acceptance any testing is the responsibility of both Parties who must verify the quality of the testing process and the test results. The following sections describe the roles and responsibilities that need to be filled in order to keep the test process clear and manageable. The project plan will contain details of test organisations.

3.6.2 Overall Test Manager

3.6.2.1 At each stage of testing there needs to be regular contact between the operators to track the progress of testing and resolve any issues that could arise. Each operator will appoint a person who is in charge of testing and known as the Overall Test Manager. The Overall Test Managers should overview all test activities, planning and constantly monitor interconnect testing progress.

3.6.3 The Overall Test manager has the following responsibilities:

- completion of the project plan
- tracks progress of each test phase
- checks entry and exit criteria for each phase
- overall ownership of the Testing Fault List for the operator
- confirms completion of all test phases
- delivery of the final test report
- delivery of interconnection to the O&M phase.

3.6.4 Test Manager

3.6.4.1 For each phase a test manager will be assigned with the following responsibilities:

- detailed planning of the test phase (documented in the Test Guidelines);
- execution of the tests for the corresponding test phase;
- reporting testing progress to the Overall Test Manager;
- issuing Testing Fault Reports;
- maintaining the Testing Fault Report list (with the Overall Test Manager);
- completing the Test Report.

3.7 Interconnect Testing Documentation

3.7.1 The Interconnect testing documentation, the form of which is Appendix 7, is as follows:

	Document	**Responsible persons**
Overall	Project Plan	Overall Test Manager
	Testing Fault List	Overall Test Manager
	Final Test Report	Overall Test Manager
Individual Location Test	ILT Test Plan	ILT Test Manager
	ILT Test Guidelines	ILT Test Manager(s)/ ILT Testers
	Testing Fault Reports	ILT Test Manager(s)
	ILT Test Report	ILT Test Manager(s)

Network Interconnection Test	NIT Test Plan	NIT Test Manager(s)
	NIT Test Guidelines	NIT Test Manager(s)/ NIT Testers
	Testing Fault Reports	NIT Test Manager(s)
	NIT Test Report	NIT Test Manager(s)
First Live Traffic	FLT Test Plan	FLT Test Manager(s)
	FLT Test Guidelines	FLT Test Manager(s)/ FLT Testers
	Testing Fault Reports	FLT Test Manager(s)
	FLT Test Report	FLT Test Manager(s)
Operational field trial	OFT Test Plan	OFT Test Manager(s)
	OFT Test Guidelines	OFT Test Manager / OFT Testers
	Testing Fault Reports	OFT Test Manager(s)
	OFT Test Report	OFT Test Manager(s)

APPENDICES

APPENDIX 1	Trunk Group Classifications
APPENDIX 2	Performance Reports and Issue Resolution Reports
APPENDIX 3	Forecast Forms
APPENDIX 4	Order Plan
APPENDIX 5	Fault Management Form
APPENDIX 6	Fault Restoration Times
APPENDIX 7	Testing Templates

And additional Appendices to which the Parties agree in writing.

Appendix 1 - Trunk Group Classifications

Services shall be designated to the following trunk groups.

Trunk Groups

Classification	Outgoing/Incoming	Group

Appendix 2 – performance reports and Issue Resolution Reports

INSTRUCTIONS:

The Service taker will indicate in Section 1, all existing and ordered services. In each quarter following the report period, both Parties will exchange the information in Sections 2 and 3 for each service.

Section 1 – Existing and Ordered Services

Service Taker						
Report date						
Existing network links						
				Trunk Route		
Service no.	**Origin**	**Destination**	**No. Links**	**Name**	**Type IC/OG**	**No.**
Ordered services						
				Trunk Route		
Service no.	**Origin**	**Destination**	**No. Links**	**Name**	**Type IC/OG**	**No.**

Section II – Quarterly Report

Service being reported	

Report period													
Report Items	**Report Month**	**Previous 12 months**											
		1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Traffic Volumes													
No. of minutes/service (source: billing system)													
No. of calls/service (source: billing system)													
Busy hour (time)													
No. of calls in busy hour													
2. Performance Measures													
Link Availability													
Call Completion Rate													
Total No of Faults													
No. of network faults													
Total network restoration time													
No. of link faults													
Total link restoration time													

Section 3 – Detailed Fault Information Report

Service Taker						
Service being reported						
Report period						
Fault Details						
Fault log #	Fault reported	Fault class	Other affected party	Cause of fault	Target restoration time	Actual restoration time

Appendix 3 – Forecast Forms

Section 1 – Contact Details

Service Taker				
	Name	**Address**	**Telephone #**	**Fax #**
Liaison Manager				
Planning Manager				
Operations Manager				
Fault Control Manager				
Service Quality Manager				
Project Manager				

This forecast has been submitted as part of the interconnect forecasting procedure and represents our current understanding of the traffic (liaison manager and planning manager unless stated otherwise)			
Signature		**Signature**	
Name		**Name**	
Position		**Position**	
Date		**Date**	

Section 2 – Interconnection Forecast

Service Taker											
Existing point of Interconnection											
GT&T POI			Telco POI								
Service	**Service ref.**	**Carrier System**	E1 links forecast								
			Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**TOTAL**
TOTAL											
New point of Interconnection											
GT&T POI			Telco POI								
Service	**Service ref.**	**Carrier System**	E1 links forecast								
			Q1	**Q2**	**Q3**	**Q4**	**Q5**	**Q6**	**Q7**	**Q8**	**TOTAL**
TOTAL											

Section 3 – Bi-Annual Traffic Forecasts

Forecast Quarter						
Start Date			End Date			
Service ref.	Origin	Destination	SERVICE TRAFFIC FORECAST Total traffic (Erlangs)	Busy Hour period	Busy Hour traffic (Erlangs)	No. E1 Links *(copy to section II)*

Appendix 4 – Order Plan

Section 1 – Contact Details

Service Taker				
	Name	Address	Telephone #	Fax #
Liaison Manager				
Planning Manager				
Operations Manager				
Fault Control Manager				
Service Quality Manager				
Project Manager				

Signature		Signature	
Name		Name	
Position		Position	
Date		Date	

Section 2 – Existing Services

Service Taker		**Date**	

Existing Network Links						
Service ref	**Origin/ Destination**	**Carrier type**	**No of Links**	**Trunk**		
				Route name	I/C or O/G	No.

Section 3 – New Requirements

New requirements

Interconnect Switches				**Carrier system**			
Service Taker	**Point code**	**Service Provider**	**Point code**	**Carrier type**	**No. Links**	**Link Usage**	**Order type new/ change**

Link Requirements							
Origin	**Destination**	**Trunk route name**	**Trunk route type I/C or O/G**	**No of trunks**	**Line code signalling & framing**	**Ready for test date**	**Ready for service/ termination date**

Change Details						
Service	**Change** Increase Decrease Relocate Reconfigure POC New POC	**Trunk route name**	**Trunk route type I/C or O/G**	**Time slot info**	**CIC assignment**	**Dialled digit info**

Section 4 – Network or Circuit Diagram

Separate attachment**.**

Appendix 5 – Fault Management Form

Both Parties shall maintain a log of the information relating to all reported Faults. This information shall be made available to either Party at agreed intervals or as required.

SECTION I – TECH. FAULT REPORT

ITEMS	DETAILS
Telco Tech. Fault Log No.	
GT&T Tech. Fault Log No. #	
Fault report date	
Time detected	
Person detected	
Time Reported	
Person Reporting	
Fault owner	
Other Affected Party	

SECTION II – TECH. FAULT IMPACT

ITEMS	DETAILS
Fault Type (Network / Carrier System)	
Fault Status (SA/NSA) Critical/Major/Minor Link/Route	
Service Affected	
Supplementary details to aid fault identification	

SECTION III – TECH. FAULT RESTORATION

ITEMS	DETAILS
Cause of fault	
Clearance date + time	
Person Clearing	
Person receiving clearance	
Confirmation time	
Person requesting confirmation	
Response time	
Restoration time	
Verification time	

SECTION IV – TECH. FAULT RESTORATION ACTIVITIES

DATE	TIME	ACTION TAKEN
Cont'd…		

Fault type	Classification
Critical Link Failure	100% of total signalling capacity is unavailable
Major Link Failure	50% of total signalling capacity is unavailable
Critical Route Failure	50% or more of total capacity of the route is unavailable to carry traffic.
Major Route Failure	25% to < 50% of total capacity of the route is unavailable to carry traffic
Minor Route Failure	1% to < 25% of total capacity of the route is unavailable to carry traffic

SECTION V – FAULT ESCALATION (if appropriate)

Dispute Details			
Telco Escalation List			
Date	Name	Position	Response
GT&T Escalation List			
Date	Name	Position	Response

Appendix 6 – Fault Restoration Times

Interconnection Faults

Tech. Fault Restoration Times	**Max time in which faults are repaired following notification to the other Party**
Faults concerning the links for Interconnection (excluding 3rd party faults)	80% of Faults to be resolved in 8 hours 95% of Faults to be resolved in 33 hours Remaining faults to be resolved by agreement.

Other Service Faults

Tech. Fault Restoration Times	**Time in which faults are repaired following notification to the other Party**
Faults concerning Service	80% of Faults to be resolved in 8 hours 95% of Faults to be resolved in 33 hours Remaining faults to be resolved by agreement

Appendix 7 – Interconnecting Testing Forms

Section 1 – Summary of Interconnect Tests

SECTION I – PHYSICAL INSPECTION Ensure joint box termination points meet agreed standard. Ensure networks of both Parties are prepared to agreed std. Ensure both Parties have interfaces that conform to agreed standards Test electrical wiring & grounding	**SECTION IV – TEST CALLS** Origination Routing Destination Transmission Quality Billing Verification/ Validation Billing Record Processing
SECTION II – LINK TESTS Link Code Signalling Compatibility Framing Compatibility Bit Error Test (BET): 0 over 24 hrs. Frame Loss: 0 over 24 hrs. DSX-1 Standards Volt Standard	**SECTION V – SYSTEM FAILURE & ALARM TESTS** Verify all relevant alarm points are wired. Generate system alarm and validate expected notification. Test system failure and recovery alarms. Conduct system back-up & recovery procedures. Perform system security tests.
SECTION III – C.7 SIGNALLING TESTS Link State Control Transmission & Reception Control Signalling Link Management Changeover Changeback Forced Rerouting (where necessary) Controlled Rerouting (where necessary) Signalling Route Management Circuit Supervision Normal Call Set-up Ordinary Calls	**SECTION VI – OPERATIONAL FIELD TRIAL** Operate system for agreed period. Verify system performance under load conditions. Monitor service quality during high traffic. Modify and re-test as required.

LINK TESTS	**TEST CALLS**

Fibre Level testing i.e link budget confirmation Link Code Signalling Compatibility Framing Compatibility Bit Error Test (BET): 0 over 72hrs . Frame Loss: 0 over 24 hrs.	Origination Routing Destination Transmission Quality Billing Verification/ Validation Billing Record Processing
\	**SYSTEM FAILURE & ALARM TESTS** Verify all relevant alarm points are wired. Generate system alarm and validate expected notification. Test system failure and recovery alarms. Conduct system back-up & recovery procedures. Perform system security tests.
CCS .7 SIGNALLING TESTS Link State Control Transmission & Reception Control Signaling Link Management Changeover Changeback Forced Rerouting Controlled Rerouting Signaling Route Management Circuit Supervision Normal Call Set-up Ordinary Calls	**OPERATIONAL FIELD TRIAL** Operate system for agreed period. Verify system performance under load conditions. Monitor service quality during high traffic. Modify and re-test as required.

Section 2 – Testing Fault Report Template

Part I (to be completed by one of the test-teams)

Test Case Number:		
Description of test case:		
Expected result:		
Observed result:		
Comments (concerning the configuration, related problems, consequences, hints)		
Name:	**Date:**	**Signature:**

Part II (to be completed by test managers)

Required action(s)	**Who**	**Deadline**	**Fault classification** (Note 1)
Test Manager GT&T	**Date:**	**Signature:**	
Test Manager Telco	**Date:**	**Signature:**	

Note 1:-
* = imperfection, ** = minor, *** = major, **** = inadmissible, ***** = fatal

Part III (to be completed by operations & development team)

Action taken to resolve fault:		
Remaining open issues:		**Re-test necessary (Y/N)**
Name:	**Date:**	**Signature:**

Part IV (to be completed by the test team)

Result of the re-test:		
Comment:		
Name:	**Date:**	**Signature:**

Section 3- Testing Fault List

Reference Number	Date Logged	Owner	Priority	Status	Date Expired	Description	Action By

Section 4- Physical Connectivity Test Form

Part I- Design Form

This Form sets out the design and testing of physical connectivity as agreed between the Parties. There is to be no change to the design or test specification for the physical connectivity testing, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Part II- Post-Test Form

This form is to confirm the design and testing of the physical connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for the physical connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Section 5 - Transmission Systems Connectivity Test Form

Part I- Design Form

This form is for the design and testing of the Transmission Systems connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Transmission Systems connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Part II – Post-Test Form
This form is to confirm that the design and testing of the transmission systems connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for the transmission systems connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Section 5 – Logical Switch Connectivity Test Form

Part I- Design Form

This form is to confirm that the design and testing of Logical connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for logical connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Part II – Post-Test Form

This form is to confirm that the design and testing of Logical connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for logical connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Section 6 – Signally Connectivity Test Form

Part I- Design Form

This form is to confirm that the design and testing of Signalling (ISUP) connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Signalling (ISUP) connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Part II – Post-Test Form

This form is to confirm that the design and testing of Signalling (ISUP) connectivity between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Signalling (ISUP) connectivity, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Section 7 – Call Routing Test Form

Part I- Design Form

This form is to confirm that the design and testing of Call Routing between the parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Call Routing, without the expresses written signed agreement of both parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Part II – Post-Test Form

This form is to confirm that the design and testing of Call Routing between the parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Call Routing, without the expresses written signed agreement of both parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		

Section 8 – Billing and Invoice Test Form

Part I- Design Form

This form is to confirm that the design and testing of Call Billing and Reconciliation between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Call Billing and Invoice Reconciliation, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CFO sign off		
Name		
Telephone number		
E-mail		
Market CFO sign off		
Name		
Telephone number		
E-mail		

Part II – Post-Test Form

This form is to confirm that the design and testing of Call Billing and Reconciliation between the Parties has been completed successfully. This is to confirm that no change was made to the design or test specification for Call Billing and Invoice Reconciliation, without the expresses written signed agreement of both Parties.

Signatory details of both companies

	Telco	**GT&T**
GROUP CFO sign off		
Name		
Telephone number		
E-mail		
Market CFO sign off		
Name		
Telephone number		
E-mail		

Section 9 – Commencement of "Live Traffic" Form

The Parties now agree to deliver "live" traffic in accordance in accordance with the design and test specifications.

Signatory details of both companies

	Telco	**GT&T**
GROUP CTO sign off		
Name		
Telephone number		
E-mail		
Group CTO sign off		
Name		
Telephone number		
E-mail		
Market CTO sign off		
Name		
Telephone number		
E-mail		