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# TERMS OF REFERENCE

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ACQUISITION OF SERVICES FOR  
WEB-HOSTING INTERNET CONNECTIVITY  
AT MARINA-STCW OFFICE

## INTRODUCTION

The Maritime Industry Authority (MARINA) was created on 01 June 1974 as an attached Agency to the Office of the President (OP) with the issuance of Presidential Decree No. 474, otherwise known as the Maritime Industry Decree of 1974, to integrate the development, promotion and regulation of the maritime industry in the country. With the creation of the Ministry (now Department) of Transportation (DOTr) by virtue of Executive Order No. 546, the MARINA was attached to the DOTr for policy and program coordination on 23 July 1979. By virtue of Republic Act No. 10635, the Maritime Industry Authority (MARINA) is established as the “Single Maritime Administration” responsible for the implementation and enforcement of the 1978 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, as amended, and International Agreements or Covenants related thereto.

One of the major requirements of the information system being used by the Marina-STCW office is the availability of internet facility that has efficient capability to access electronic data and information from different sources and share electronic data and information to the Marina central office to the regions for the processing and issuances of various certificates and online registration and viewing of records by the seafarers.

The Marina-STCW Office is currently connected to five (5) internet connections. The primary internet connection has 20 mbps while the secondary internet connection has 5 mbps, the secondary connections serves as a redundant connection to augment the primary internet connection while both links are simultaneously running and to maintain the availability of internet when either the primary or the secondary connections incurs downtime. The other connections are installed in other offices of the STCW Office. Considering the above, the Marina-STCW Office deemed it necessary to effect the enhancement of its existing Internet connection through the engagement of Internet Service Providers (ISPs) that shall provide Marina-STCW Office with efficient, reliable and cost effective internet connection.

### A. Rationale

GPPB Guidelines on the Procurement of Water, Electricity, Telecommunications and Internet Service Providers (ISPs), states that:

“3.3.1.2 At the end of each year, however, the procuring entity must assess the quality of service provided by its ISP. For instance, it must compare the cost charged by its ISP and the range of service it offers as against other service providers in the area. It may also consider new technologies that may prove less costly. In assessing the quality of service provided by its ISP, procuring entities are encourage to consult the National Telecommunications Commission, or the Information and Communication Technology Office, or other relevant government agencies regarding any new policy or directive in the implementation or use of new technology.”

Considering the above premise, upon verification of the current market prices for internet connectivity, as well as, its internal policies, the MARINA can acquire an internet connection viz the allocated budget for the implementation. Thus, this Terms of Reference (TOR).

## **B. Objective**

The objective of this procurement is to provide a fast and reliable web-hosting internet connectivity to MARINA-STCW Office.

## **C. Definition of Terms and Acronyms**

1. IP – Internet Protocol is a communication protocol for network interconnection boundaries.
2. CIR (1:1) – Committed Information Rate, One is to one – a guaranteed equal internet bandwidth and data rate for both downstream and upstream at all times.
3. Mbps – Stands for millions of bits per second or megabits per second. It is a total information flow over a given period of time over a telecommunication medium.
4. ISP – Refers to the Internet Service Provider authorized and capable in providing high quality and reliability internet connectivity.
5. Datacom – Data Communication facility of the Maritime Industry Authority (MARINA) Central Office.
6. TCP/IP – Refers to Transfer Control Protocol/Internet Protocol, is a networking model protocol used for the internet and similar network.
7. SIP – Session Initiation Protocol, a signaling communication protocol widely used for controlling multimedia communication session such as the Voice over Internet Protocol (VoIP).
8. MRTG – Multi Router Traffic Grapher is a data usage monitoring software application for internet connectivity.
9. DNS – Domain Name Server, a hierarchical distributed naming system or a private network.
10. CPE – Customer Premises Equipment, generally refers to devices to be provided and installed by the ISP to end-user that enable to access internet service.
11. TCBH – refers to the Time Consistent Busy Hours, the period by which the average traffic of the resource group concerned is greatest over the day under consideration.
12. PACKET LOSS – the percentage of data “packets” sent to a server that never arrived.
13. PING – is the measure of how long it takes a “packet” of data to travel from computer terminal to the server and back.
14. JITTER – is the variance in successive ping measurements.
15. MARINA – Maritime Industry Authority
16. STCW - Standards of Training, Certification and Watchkeeping

## D. Technical Requirements

### 1. System Configuration

The network must be in mesh configuration to ensure the seamless high quality of connectivity.

Should have a Committed Information Rate of 1:1 unlimited internet connection to/from MARINA – STCW Office with at least 99.5% uptime service availability and both download and upload stream is the same as specified at all times.

The internet connection must be a dedicated telecommunication link from the ISP to MARINA – STCW Office with following Quality of Service (QoS) parameters:

| Parameters                          | Minimum QoS  |
|-------------------------------------|--|
| 1. Bandwidth Utilization/Throughput | <ul style="list-style-type: none"><li>95% link(s) / route bandwidth utilization during peak hours (TCBH). If on any link(s)/route bandwidth utilization exceeds 90%, then the network is considered to be congested.</li></ul> |
| 2. Broadband Connection Speed       | <ul style="list-style-type: none"><li>At least 80% (non-dedicated) and 95% (dedicated lines) speed of connection (up/down stream) from ISPs server to the subscriber shall be achieved fulltime(24/7).</li></ul>               |
| 3. Network Latency                  | <ul style="list-style-type: none"><li>The round trip delay for traffic within the local broadband network from end-user to ISP/IX should be less than 150 ms for 95% peakttime</li></ul>                                       |
| 4. Service Availability             | <ul style="list-style-type: none"><li>Greater than 99% of the time, network shall be available to the subscribers permonth.</li></ul>  |

All static IP addresses for MARINA – STCW Office must be provided with primary and alternate IP address as well as all Domain Name (DNS) of the ISP. All significant settings and configurations of all devices such as CPEs (modems, routers, network adaptor, network access gateways, and the like) must be provided by the ISP to MARINA including settings and configurations for back-up devices.

ISP must submit a detailed work plan specifying installation design, detailed activities with timeline, connectivity diagram from end user premise up to the last mile in order to determine compatibility with the existing systems and/or building electrical power requirements.

Install last mile cabling and termination block/box with lightning protection unit outside and within MARINA – STCW Office and premises necessary in establishing connectivity between ISPs network and the Network Terminal of the MARINA – STCW Office without extra cost to the MARINA.

Provide 24/7 basis hotline technical support assistance in troubleshooting issues affecting the internet connection.

Provide 24/7 monitoring tool available online that would show historical and real-time performance of the Internet service (MRTG).

## 2. Technical Requirements and evaluation parameters

| Direct Internet Connection Parameter   | Evaluation Parameter   |
|--|--|
| Setup dedicated direct internet connection with a minimum 60 Mbps at MARINA – STCW Office                                      | At least CIR full bandwidth (1:1) 60 Mbps for MARINA – STCW Office   |
| Provide and install CPE and Router at both ends of the internet connection   | Configure Channel Service Unit (CSU)/Data Service Unit (DSU) Modem/Router  |
| Configure backup router in case of reackdown   | Configure back-up (stand-by) router  |
| Assign Public Internet Protocol (IP) Addresses to MARINA – STCW Office   | At least 20 usable public IP Addresses   |
| Provide Domain Name Server (DNS) reverse lookup for entries with the assigned classless network                                | Reliable DNS reverse-look up   |
| Provide reliable forwarding and secondary DNS  | Reliable Forward and Secondary DNS   |
| Provide the termination block/box from end-user to last mileconnection   | Install termination block/box with lightning protection unit for MARINA – STCW Office  |
| Availability and Quality of Connection   | Not less than 99.5% link uptime per month  |
| Latency(Delay)   | Not more than 80 milliseconds average round trip from end-user to ISP port<br><br>Not more than 200 milliseconds average round trip from ISP to outside or international ISP port. |
| PacketLoss   | Must be within 0 to 1%   |
| Jitter   | Must be lower than 80 milliseconds   |
| Measured Network Quality   | Grade equivalent to A  |
| Provide available single point of contact for customer support for Marina-STCW Office  | Provide account manager/officer as a single point of contact for local customer support  |
| Install monitoring tool for access/usage report of monthly utilization graphs (MRTG) to desktop computer to provided by MARINA | 24/7 operational desktop computer with MRTG at MARINA-STCW Server Room facility with full network administration access  |
| Provide proactive notice of scheduled downtimes or service interruption  | Not less than 7 days   |

|   |  |
|---|--|
| ISP shall notify the MARINA – STCW ICTMD in writing prior to the required inspection/testing of internet service connection | Must be received seven (7) days prior to testing |
| Render customer service support   | 24 hours x 7 days                                |
| Provide “Performance Credit” or rebate in the Service Level Agreement (SLA)   | Performance Credit                               |
| Provide detailed work plan  | Detailed work plan timeline                      |

## II. APPROVED BUDGET FOR THE CONTRACT(ABC)

The Approved Budget for the Contract (ABC) inclusive of administrative fees, VAT and all government taxes is **One Million Pesos (₱1,000,000.00)**.

## III. GENERAL GUIDELINES FOR EVALUATION AND SELECTION OF PROPOSAL

### a. Commercial Availability of the Service

The ISP’s proposed system solution must be commercially available at MARINA – STCW Office with location/address:

| No | Office/Unit  | Min BW Required | Graphical Coordinates<br>(Latitude / Longitude) |              | Physical Address  |
|----|--------------|-----------------|---|--------------|---|
| 1  | MARINA-STCWO | 60 Mbps         | 14.58388457                                     | 120.98444402 | 984 Parkview Plaza, Taft Avenue corner Kalaw Street, Manila |

### b. ISP Qualification Requirements

It is important that the ISP of the proposed system solution have sufficient experience and resources required to support the Marina’s current and future communications needs. The ISP must provide the following information:

1. Must be a ISP/Telco Company that has its own core data network running over its own domestic fiber optic backbone network.
2. Must have the capacity and ability to provide maintenance services and technical support.
3. ISP must have at least 90% existing fiber optic connection from their central terminal switch to Marina-STCW Office.
4. Should submit copies of Client Satisfactory Certificates from at least three (3) clients each for the last three (3) years for similar contracts. Similar contract refers to the minimum bandwidth service specified in this project.

### **c. Technical Requirements**

1. The bidder shall submit a certification issued by The National Telecommunications Commission (NTC) supporting that the company is a certified ISP/Telco.
2. Shall submit undertaking that the company has the capability and ability to provide maintenance service during the period of subscription, shall provide technical personnel to service the communication link and equipment, shall provide Help Desk (on-call and on-site support) 24x7 including holidays, provide technician and service units in case of pull-out within 24 hrs after a problem has been reported for sites within Metro Manila and its resolution time without additional cost to MARINA.
3. Shall submit Certificate of Employment with respective valid professional certificates of at least two (2) Certified Network Associates.
4. Shall submit network layout labeled as EE Plan 1-1 showing connectivity from end user's data terminal facility up to the last mile duly signed by Licensed Electronics Engineer (EE) with his/her valid Professional Tax Receipt (PTR) and PRC ID.
5. Shall provide detailed work plan specifying installation design, detailed activities and timelines must be duly signed and sealed with Licensed Electronics Engineer (EE) with his Professional Tax Receipt and valid PRC ID.
6. Shall submit an undertaking to have complied with Technical Requirements/ Evaluation Parameters specified at Section I.E.2 of this TOR.

### **IV. SCOPE OF WORK**

The project covers the delivery, installation, testing, maintenance, documentation and support of Wide Area Network (WAN) Services – Internet Connectivity for a period of 1 year (Web-Hosting internet connectivity at MARINA – STCW Office) It involves the following:

- a. Engagement of Web-Hosting ISP from MARINA-STCW Server Room facility.
- b. Integration of the proposed internet connections to existing MARINA-STCW network infrastructure. The winning ISP bidder/s shall provide necessary hardware, terminations and other services required to setup the internet connection. Details of the technical requirements are indicated in Section IX of this TOR.
- c. Provision of diagnostic reports and updates in case of connection failure.
- d. Provision of monthly utilization graphs and/or MRTG tool for monitoring of link quality and bandwidth utilization to be installed at agency's provided PC at MARINA – STCW server room.
- e. Delivery of an IPV6 ready and/or compliant connection.
- f. Provision of 24/7 support service.

- g. Entering into a Service Level Agreement which defined parameters of rebates for non-performance and other conditions set in this TOR.
- h. In case the MARINA transfers to a new location, the Provider must transfer the connection to its new location at no additional cost to MARINA.

## **V. DUTIES AND RESPONSIBILITIES OF THE ISP**

### **a. Pre-Installation**

Provide detailed work plan with timeline specifying installation design, detailed activities, network diagram showing connectivity from end users Network Terminal Cabinet MARINA – STCW Office up to the last mile.

### **b. Actual Installation**

1. Set-up Internet Connection with the Committed Information Rate (CIR1:1) of 60 Mbps for MARINA – STCW Office both upstream and downstream network traffic flows at MARINA – STCW Server Room facility.
2. Provide and install a CPE devices (CSU/DSU and Router) at both ends of the Internet connections.
3. Provide internet connectivity directly to end user's data network terminal facility, including materials needed for the purpose. This provision for the installation of lighting protection system and cables/insulations using industry standards and materials.
4. Complete the delivery, installation, configuration, commissioning and testing within 15 calendar days from the receipt of the Notice to Proceed (NTP). Any extension shall be requested in writing to MARINA-BAC through the TWG for ICT.

### **c. Configuration**

1. Configure CPE for dedicated direct internet speed connection.
2. Assign at least 20 usable hosts public Internet Protocol (IP) address to the MARINA-STCW Office.
3. Configure backup router, if any.
4. Provide DNS reverse lookup for entries with the assigned classless network.
5. Provide reliable Forwarding and Secondary DNS.
6. Provide/install MRTG monitoring tool with full network administration access for monthly usage report graphs, link quality and bandwidth utilization to Desktop PC which will be provided by MARINA-STCW Office at its Server Room facility.



## 7. Router Specifications:

- Wire-speed performance for concurrent services such as security and voice , and advanced services to multiple T1/E1/xDSL WAN rates.
- Enhanced investment protection through increased performance and modularity
- Increased density through High-Speed WAN Interface Card Slots (four)
- Enhanced Network Module Slot
- Support for over 90 existing and new modules
- Support for majority of existing AIMs, NMs, WICs, VWICs, and VICs
- Two Integrated 10/100 Fast Ethernet ports
- Optional Layer 2 switching support with Power over Ethernet (PoE) (as an option)
- Security
  - On-board encryption
  - Support of up to 1500 VPN tunnels with the AIM-EP11-PLUS Module
  - Antivirus defense support through Network Admission Control (NAC)
  - Intrusion Prevention as well as stateful IOS Firewall support and many more essential security features

### d. Testing Period

1. The selected ISP shall notify the MARINA in writing seven (7) days prior to the required inspection/testing of the internet service connection.
2. The acceptance test procedure shall be in accordance with the following:
  - a. The acceptance testing will be undertaken for a period of seven (7)days.
  - b. Direct internet leased line / will have no service interruption during the agreed test period.
  - c. The guaranteed Internet bandwidth with its defined CIR at MARINA – STCW Office should be attained during working hours (6:00 AM to 9:00PM).
  - d. Average latency should not exceed more than 80 milliseconds average round trip from subscriber to ISP port and not more than 200 milliseconds average round trip from ISP to its international port.
  - e. MRTG should be in place and operational.
  - f. Assignment of at least 20 usable public IP Addresses

- g. Provider must conduct a Bit Error Rate (BER) test or equivalent during the testing period to eliminate Cyclic Redundancy Check (CRC) errors.

If any of the foregoing conditions are not met, the count of the testing period shall be restarted until all of these conditions have been duly satisfied continuously for a specified period.

The start of contractors billing shall be based on the date of issuance of "Certificate of Acceptance"

During the testing period, the contractor shall not be held liable for performance degradation / interruption that are beyond its control such as power outages, fluctuations or failure or malfunction of MARINAs own equipment, and/or international/regional wide backbone problem.

3. The MARINA shall issue immediately the Certificate of Inspection and Acceptance to the Service Provider upon successful completion of the test and conforms to Section I.E and V.d.2, respectively.

#### **e. Implementation**

1. Shall maintain all equipment in proper working order.
2. Provide an escalation list and procedure in reporting fault and outages.
3. Providers must notify MARINA prior to any downtime occurrence or if any case the internet rerouted to a back up link.
4. Providers must have standby equipment to replace immediately the existing equipment once found defective.

#### **f. Rebates**

1. Provide industry standard Service Level Agreement (SLA) which shall carry a corresponding "Performance Credit" or rebate in favor of MARINA should any of the committed parameters mentioned below is not met.
2. The ISP provider should be able to render the following services:
  - a. Availability – Provide 99.5% link uptime per month
  - b. Latency
    - i. Provide not more than 80 milliseconds average round trip latency from subscriber to ISP provider port; and
    - ii. Provide not more than 200 milliseconds average roundtrip latency from local ISP to International provider port.
  - c. Customer Service Support – renders 24/7 service support as follows:
    - i. 30 minutes for emergency tickets for the following categories:
      1. Link connection is down
      2. Packet loss, variation in latency

3. Routing issue
  - ii. Two (2) hours response time for technical problem that requires on-site services. For problem reported after 5:00 PM, services shall be rendered 8:00AM of the following day

3. Rebate schedule for downtime connection interruption/outage – If the interruption is attributed to ISP, as acknowledge by the ISPs Fault Management Center, the ISP shall voluntarily make the appropriate “Performance Credit” or rebate to the MARINA without the need to report or claim on the outage. The credit allowance / rebate shall be applied to the next billing month.

Following are the allowable Credit for Interruptions to service.

1. Interruption of 24 hours or less

| Length of Interruption                      | Credit                 |
|---|------------------------|
| Less than 30 minutes (<30 minutes)          | None                   |
| 30 – 179 minutes (30 minutes to 2.9833 hrs) | 3/10 day or 0.3 day    |
| 180 – 359 minutes (3 hrs to 5.9833 hrs)     | 3/5 day or 0.6 day     |
| 360 – 539 minutes (6 hrs to 8.9933 hrs)     | 1 1/5 days or 1.2 days |
| 540 – 718 minutes (9 hrs to 11.9833 hrs)    | 1 4/5 days or 1.8 days |
| 720 – 899 minutes (12 hrs to 14.9833 hrs)   | 2 2/5 days or 2.4 days |
| 900 – 1440 minutes (15 hrs to 24 hrs)       | 3 days                 |

2. For interruption over 24 hours, credit will be allowed in 3/5 day multiplied for each 3-hour period of interruption or a fraction thereof over 24hours.

**g. Maintenance**

1. Provide a single point of contact for customer support of network connectivity and internet access;
2. Shall respond to request for maintenance at no cost to MARINA;
3. Provide not less than 7 days proactive notice of scheduled downtimes, service interruption, upgrades or preventive maintenance, if any; subject to the approval of MARINA and
4. Submit month access/usage reports to attest compliance to the SLA.

**VI. DUTIES AND RESPONSIBILITIES OF MARINA**

- a. Grant the ISP’s authorized representative access to its premises, equipment and facilities located therein to perform its obligations, provided that such representative shall be accompanied by the duly assigned MARINA personnel;
- b. Responsible for the safe custody and use of the equipment installed by the ISP provider.

- c. Monitor the provided services and verify if the equipment under the Service Level Agreement are met and performed by the ISP provider.
- d. Issue Certificate of Inspection and Acceptance as stipulated in Section V.d.
- e. Pursuant to General Procurement Policy Board (GPPB) Resolution No. 019–2006 dated 06 December 2006, at the end of each year, MARINA will conduct an assessment of the quality of service provided particularly the cost charged by the ISP provider and the range of services it offers against other service providers in the area; and
- f. Conducts assessment/evaluation of the ISP 60 days before the end of the contract. The MARINA may renew the contract for another year depending on the ISP performance.

## VII. TEST AND EVALUATIONPROCEDURE

For this purpose, the MARINA Acceptance Committee is created pursuant to Special Order Number \_\_\_\_\_ dtd \_\_\_\_\_;

Generally, the acceptance committee must take note of the physical set up to be in accordance with the requirements, the use of functional parameters and operational limits set by this Terms of Reference applicable to the equipment under test. Following is the test conditions, equipment and procedure in the conduct of testing.

### 1. Standard Test Conditions

- a. *Power source* – sufficient power shall be available to operate the equipment under test at its rated power, voltage and current; and
- b. *Standard Temperature* – should be the standard ambient temperature between 10 to40°C

### 2. Test Equipment

- a. Laptop computer with following minimum specification shall be used
  - 1. At least 2 GHz CPU Processor
  - 2. 3.0 GBRAM
  - 3. 2G and 5G Wireless Adapter
- b. Cat 6 Cable connectors / Patch Cord
- c. IP Phone (if applicable)

### 3. Test Methods

1. Visual Inspection – Conduct visual inspection of the equipment and devices of the installed system prior to the conduct of functional test

#### **Procedure:**

- a. Conduct visual inspection on the configuration of all delivered equipment and devices of the installed system;
- b. Check all wires and cable connections between the internet system and the CPE and other external component as case maybe

#### **Standard:**

- a. In case of non-compliance with the visual inspection in accordance with the procedure and industry standard, functional testing shall not be conducted;
- b. Functional testing must be based on the conditions stated in the TOR

4. **Functional Test** – conduct of functional test based on conditions stated in this TOR

#### **a. Bandwidth/Speed Test-**

#### **Procedure:**

- b. Connect the laptop computer to the internet under test;
- c. Log on to <http://www.speedtest.net>
- d. Observe and record the download and upload speed in the attached table (Annex A) indicated in the result;
- e. Log on to <http://www.pingtest.net>
- f. Observe and record the Network Line Quality, Packet Loss, Ping Measurement and Jitter amount as indicated in the display in the table provided.
- g. Repeat procedures b to e at least three (3) times per period, for at least random 3 period (8AM to 5PM) for 5days.

**Standard:** (Conditions stated in this TOR), For Internet connectivity requirement of CIR 1:1

- a. Speed must not be lower than the requirement
- b. Packet Loss must be within 0 to1%
- c. Ping must be lower than 50milliseconds
- d. Jitter must not exceed 80milliseconds
- e. Measured Network Quality must at least have a line grade A equivalent
- f. For internet connectivity other than CIR 1:1 requirement, the reference standard should follow or equal to the value stated in TOR.

### VIII. ACCEPTANCE

Certificate of Acceptance shall be issued after fifteen (15) working days upon completion of the Test and Evaluation, provided all requirements and conditions are met.

### IX. BILL OF QUANTITIES

| ITEM/PARTICULAR  | QUANTITIES           |
|--|----------------------|
| a. 60 Mbps CIR 1:1 Internet connection for MARINA–STCW Office; IPV6ready | 1 lot                |
| b. Usable Static Public IP for MARINA –STCW Office                       | 20 static public IPs |
| c. Cabling/wiring and connectors   | 1 lot                |
| d. Termination Box with lightning protection system                      | 1 lot                |
| e. Router  | 3 units              |

### X. OTHER REQUIREMENTS

- 1. ISPs shall provide 1 unit of CPE (modem or its equivalent) to be installed/configured at MARINA – STCW Office.
- 2. ISPs shall provide 3 units of Router (VPN ready or its equivalent) to be installed/configured at MARINA – STCW Office.
- 3. ISPs shall install MRTG tool and operational for monitoring of link quality and BW utilization to MARINA – STCW Desktop computer.
- 4. ISPs shall be responsible for the transfer/relocation of internet connectivity, without cost to MARINA in any case the server room or network termination is transferred to its new location.

5. Support response time shall not be more than 30 minutes for emergency tickets for following categories, such as, Link Connection, Packet Loss, Variation of Latency and Routing Issue downtimes.
6. Support response time shall not be more than (2) hours for technical problem that requires on-site services upon receipt of the report.
7. Rebate schedules for downtime connection interruption/outage. If the interruption is attributed to ISP and acknowledge by the ISP fault management center, the ISP shall voluntarily make the appropriate "Performance Credit" or rebate which shall be applied to the next billing month without the need to report or claim application on the failure.

## **XI. TERMS OF PAYMENTS**

Payment shall be made on monthly basis for 12 months subject to submission of billing statement and other supporting documents by the ISP and the issuance of certificate of satisfactory service by the Maritime Industry Authority (MARINA).

## **XII. APPLICABILITY**

This Terms of Reference shall form part of the contract documents pertaining to the procurement of Internet Service for MARINA-STCWO.

## **XIII. DELIVERY PERIOD**

Twenty 20 Calendar Days from the receipt of Notice to Proceed

**MAY M. MANAGHAYA**  
OIC, Administrative Services Division  
STCW Office

# ACCEPTANCE TEST REPORT

Office: \_\_\_\_\_ Date \_\_\_\_\_

## 1. Visual Inspection:

- |  |   |
|--|---|
| <input type="checkbox"/> Cables Ties are in place<br><input type="checkbox"/> Presence of CPE/Router | <input type="checkbox"/> Presence of CPE/Modem<br><input type="checkbox"/> Other Devices, Specify _____ |
|--|---|

Remarks: \_\_\_\_\_

## 2. Functional Test:

| Date  | Time | Office/<br>CIR 1:1 |          |        | Packet<br>Loss | Ping | Jitter | Measured<br>Network<br>Quality | REMARK |
|-------|------|--------------------|----------|--------|----------------|------|--------|--------------------------------|--------|
|       |      |                    | Download | Upload |                |      |        |                                |        |
| Day 1 | AM   |                    |          |        |                |      |        |                                |        |
|       | NN   |                    |          |        |                |      |        |                                |        |
|       | PM   |                    |          |        |                |      |        |                                |        |
| Day 2 | AM   |                    |          |        |                |      |        |                                |        |
|       | NN   |                    |          |        |                |      |        |                                |        |
|       | PM   |                    |          |        |                |      |        |                                |        |
| Day 3 | AM   |                    |          |        |                |      |        |                                |        |
|       | NN   |                    |          |        |                |      |        |                                |        |
|       | PM   |                    |          |        |                |      |        |                                |        |
| Day 4 | AM   |                    |          |        |                |      |        |                                |        |
|       | NN   |                    |          |        |                |      |        |                                |        |
|       | PM   |                    |          |        |                |      |        |                                |        |
| Day 5 | AM   |                    |          |        |                |      |        |                                |        |
|       | NN   |                    |          |        |                |      |        |                                |        |
|       | PM   |                    |          |        |                |      |        |                                |        |

We, hereby certify that the above results were actually tested in our presence.

\_\_\_\_\_                      \_\_\_\_\_                      \_\_\_\_\_  
 Name and Signature                      Name and Signature                      Name and Signature

\_\_\_\_\_                      \_\_\_\_\_  
 Name and Signature                      Name and Signature