Crew Internet Access on board Ship – a Best Practice Guide

CONTENTS

Introduction
1. Other means of communication available to crew
2. Advantages to crew of having internet on board ship
3. Possible disadvantages of allowing internet access to crew
4. Control of usage
5. Other considerations
6. Future developments
Introduction

Internet enabled vessels are now commonplace in today’s world of shipping. Continuously developing technology has made shipboard internet an affordable option for many shipping companies. *(Figure 1 on page 3 is a timeline of how Inmarsat systems have evolved over the years)*

Increasing numbers of shipowners are fast realising the importance of providing internet access to crews.

Having internet on board ship is now widely regarded as a key component in the attraction of new entrants, and the retention of existing staff.

The modern generation of seafarer is accustomed to a world which is always connected, where the internet and social networking sites are a major part of everyday life. The prospect of not being able to readily communicate with the outside world, has become highly unappealing to the vast majority of today’s seafarers.

If managed correctly, shipboard internet can have many benefits, both from a commercial and crew welfare prospective.

This Best Practice Guide is designed to provide practical considerations which shipowners may wish to take into account when contemplating installing a shipboard internet system, and permitting crew to use such a system.

The Guide is by no means exhaustive and provides a brief overview only.

Whilst every effort has been made to ensure that the information contained in this Guide is correct, INTERTANKO accepts no responsibility for any errors or omissions or any consequences resulting therefrom. Nothing in this Guide constitutes legal advice.

Shipowners are strongly urged to make a full assessment of how shipboard internet could potentially impact on vessel operations, before taking the decision to install.

*INTERTANKO would like to acknowledge and thank Inmarsat for their assistance and support in the creation of this Best Practice Guide. It should be noted that INTERTANKO does not endorse Inmarsat, any of its affiliates, or any related products. All illustrations are courtesy of Inmarsat.*
1. Other means of communication available to crew

In addition to internet, the following means are amongst though available to ship’s staff to allow communication with family and friends:

- Satellite voice systems (Sat B / C, Mini-M, Fleet (33, 55, 77), FleetBroadband (150, 250, 500, etc…));
- Alternative satellite voice systems;
- Email access (Master must carry out an ‘Email Exchange’ in order to send / receive messages. It should be noted that with this system, the vessel is not continuously online. ‘Email Exchanges’ are typically carried out a few times each day).
- Personal mobile telephones;
- Telephones brought on board in port by vendors/salesmen (the call is timed and charged accordingly);
- Telephones ashore in Seaman Centres / public telephone kiosks;
- Telephone booths on the dock / jetty;
- GSM/Mobile phone calling on ship over Satellite. (see Figure 2 on page 4)
The above systems may suffer from the following disadvantages:

* **Alternative satellite telephone systems**
  - Inadequate signal reception in certain parts of the world;
  - Potential for drop in signal level during use, resulting in call being dropped;
  - Cost of calling is significantly higher, compared to using the voice function of shipboard internet systems;
  - Limited availability of handsets on board (often only one handset is assigned for private crew calling).

* **Email access**
  - In almost all cases, messages are restricted to text format only, with no attachments permitted;
  - Size restriction imposed on messages, i.e. 10 Kb.
  - Communication is not instant, as the Master has to perform a manual connection to enable messages to be exchanged.
* Personal mobile telephones
  - Very high roaming charges (the option may exist for crew to purchase a local SIM card if the vessel was in a suitable port or inshore anchorage);
  - Use restricted to when vessel is in port or coastal waters;
  - Multi-band telephones required, due to the varying operating systems in use around the world.

* Telephones brought on board in port by vendors/salesmen
  - Since the introduction of the ISPS Code, this arrangement has become much less frequent, as a result of restricted access to the vessel and vetting of potential visitors.

* Telephones ashore in Seaman Centres / public telephone kiosks
  - It should be noted that there has been a significant demise in the number of Seaman Centres in operation around the world in recent times. There are a number of factors which have caused this, including the quick turn-around of vessels in port which has resulted in crews no longer have the time to go ashore, and access restrictions imposed as a result of the ISPS Code;
  - There are typically only a few telephones provided in a Seaman’s Centre. This can often lead to seafarers standing in line, wasting limited and valuable shore leave time;
  - Issues surrounding lack of privacy;
  - There is a strong likelihood of there being a large difference in time between the location of the seafarer, and that of the person the seafarer wishes to call. This can result in the call being highly inconvenient for one of the parties;
  - Public telephone kiosks are often out of order and found in an unclean state. There is a general tendency for them to be sited in less affluent areas of the community, posing an additional safety (health) risk to seafarers;

* Telephones on docks / jetties
  - Often out of order;
  - Crew not authorized to leave vessel as a result of ISPS Code measures, and/or Port Regulations (often the telephone booths are clearly visible from the vessel).

* Internet ashore in Seaman Centres / Internet Cafes
  - Charges based on a nominal hourly rate;
  - Limited number of computer terminals which are often overcrowded as a result;
  - Concerns regarding lack of privacy;
  - Sometimes out of order.

* Port WiFi
  - Not widely available;
  - May prove too costly to use for some crewmembers.
  - A credit card may sometimes be required to access the service.
2. Advantages to crew of having internet on board ship

- Communication with family and friends made easier and much less expensive, by applications such as IM Chat, and other social networking websites;
- Useful for self-study purposes (skill diversification);
- Can be used to provide e-learning tools leading towards higher competency;
- Online banking (especially important for a seafarer who looks after his own financial affairs);
- Becoming an increasingly important factor when crew are considering joining a Company;
- Perhaps a good measure to retain existing employees;
- It has long been recognised that when crewmembers are happy and morale is high, they work more effectively and efficiently;
- The ability to keep up-to-date with world events, both on a regional & global scale;
- Raises the crew’s computer literacy through usage, hence enabling better interaction with automated systems.

3. Possible disadvantages of allowing internet access to crew (Unregulated Access)

- Reduced work output from Officers (outwith watchkeeping duties);
- If wireless access is enabled, then with today’s PDA technology, crew can access the internet even when on duty, e.g. from the Bridge / Engine Control Room or Cargo Control Room;
- Increase in fatigue levels (prolonged use of the internet resulting in less rest time) – Hours of Work and Rest policy;
- Conflicts arising amongst crew, concerning the number of internet enabled computers available;
- Distraction from work and an urge to continually want to use the internet;
- Photographs may be uploaded by ship’s staff into the public domain (Twitter / Facebook) of a perfectly legitimate shipboard operation/activity. However, such images may be misconstrued by individuals who lack a sufficient level of knowledge to understand what the photographs actually show. This could result in an unnecessary & potentially negative PR environment for the shipowner. This has been one of the reasons for crew not being permitted email attachments.
4. Control of usage (Regulated Usage)

- There are means available to restrict access to an assigned number of computers through deployment of techniques such as MAC address locking, access to pre-paid traffic, and also by restricting access to computers by time of day;
- Access can be prevented from unauthorised computers, i.e. personal laptops, which will also negate the possibility of shipborne IT systems being exposed to viruses or other such elements;
- Connections can be limited to the Standard IP service (internet at home) to prevent crewmembers selecting premium rate streaming IP services, which are primarily designed for Video Conferencing;
- Shipowners can chose to provide crew with limited internet access by using vendor software designed with a pre-paid model, where the connection is optimised and crew can pay for usage over and above what the shipowner may wish to provide for free;
- This optimisation may also be achieved by installing a control device to the crew connection, which:
  - Would optimise its efficiency by filtering out bandwidth-hungry activities, such as uploading and downloading video and audio content from social networking, internet radio, video websites and advertising from web pages.
  - Can be configured to prevent misuse of the connection by accessing inappropriate websites and applications. It also works as a firewall to stop unauthorised access.
  - Can also be used to administer a pre-paid functionality, which may be used as a means to limit the amount of time crew spend on the internet.

(see Figure 3 on page 8)
- The function exists for separate call data records and billing information for operational and crew use, by setting up independent IP connections. (A good shipboard internet system will be designed to support multiple simultaneous IP data connections);
- With some systems, the Shipping Company can monitor internet traffic with a high degree of precision, including cost optimisation.
5. Other considerations

There are a host of manufacturers who provide both software and hardware solutions. However, almost all systems utilise the Inmarsat array of Satellites. Inmarsat has long been regarded as the market leader in maritime satellite communication systems. Inmarsat are able to meet the stringent criteria set by IMO regarding the required standards for GMDSS satellite services.

At this moment in time, the majority of shipboard internet systems are based on 3G standards (FleetBroadband), which provides constant, simultaneous access to voice and high-speed data services on a global basis.

FleetBroadband is available in three terminal types, namely, 150, 250 and 500. The terminals are available from multiple approved manufacturers and offer different IP performance capabilities via a standardised set of approved hardware. The generic performance characteristics of the various terminals are shown in the table on page 9.
<table>
<thead>
<tr>
<th></th>
<th>FB500</th>
<th>FB250</th>
<th>FB150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna Size</td>
<td>~55cm</td>
<td>~25cm</td>
<td>~22cm</td>
</tr>
<tr>
<td>Weight</td>
<td>~15 Kg</td>
<td>~3-5 Kg</td>
<td>~3-5 Kg</td>
</tr>
<tr>
<td>Standard IP</td>
<td>Up to 432 kbps</td>
<td>Up to 284 kbps</td>
<td>Up to 150 kbps</td>
</tr>
<tr>
<td>Streaming IP</td>
<td>32, 64, 128, 256 kbps</td>
<td>32, 64, 128 kbps</td>
<td>No</td>
</tr>
<tr>
<td>ISDN Data</td>
<td>Yes</td>
<td>No; only 3.1KHz audio</td>
<td>No</td>
</tr>
<tr>
<td>Voice</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SMS</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The standard IP (internet protocol) service provides broadband speeds of up to 432 kbps.

Terminal costs are relatively low, ranging from about US $5,000 to US $18,000 with a choice of airtime pricing packages to best suit the shipowner’s needs.

Data transfer costs have been reported as being 50–70 per cent lower than Inmarsat B.

6. Future developments

* Introduction of GMDSS on FleetBroadband
As a first step to providing a full distress calling functionality to FleetBroadband users, Inmarsat introduced the 505 service which enables the user to directly communicate with a Coastguard Rescue Co-ordination Centre, by simply picking-up the handset of the Inmarsat telephone set and dialling 505. *(see Figure 4 on page 10)*
Following on, in May 2011, Inmarsat introduced non-SOLAS voice with distress service across all three FleetBroadband product types, which allows for prioritisation and pre-emption in both directions of calling. *(see Figure 5 on page 10)*
Introduction of GMDSS on FB – voice

Maritime Safety Voice Services is being introduced in two stages

- **Non-SOLAS with distress**
  - Applicable to entire FleetBroadband family (FB500/250/150)
  - Pre-emption and prioritisation in both directions
  - No satellite contingency arrangements

- **SOLAS with distress**
  - Applicable only to FleetBroadband Class 8 equipments (FB500)
  - IMO and IEC standards for type approval
  - Full network contingency arrangements
* Multi-Voice calling

With present FleetBroadband installations, it is only possible to place one voice call at any one time. However, with the advent of Multi-Voice calling, multiple lines of concurrent voice callings will be available from all FleetBroadband installations. *(see Figure 6 below & Figure 7 on page 12)*

**Figure 6**

**Multi-Voice Update**

- Multi Voice leverages the abilities of our 3G based BGAN network to provide multiple lines of concurrent voice callings to any FB
- The service is intended for deployment across all variants of FB
  - All FB terminals (min) : 4 Concurrent Voice Calls
  - FB250 & 500 terminals : upto 9 Concurrent Voice Calls
- Service to be available across all existent and new FB terminals
- Each lines to have individual MSISDN's of +870... range
- Calls priced in line with current FB voice pricing SRP $0.55/minute
- Discussions with manufacturers & distribution partners to align readiness for introduction of service
  - Manufacturer time lines will vary per their schedules
- Introduction of a billed service expected in Q4 2011
* **Inmarsat-5, Global Xpress**

Global Xpress is being hailed as the future of broadband connectivity. Satellites and network will be from one source, and the system will ensure ease of transition into Ka-band from both L and KU-bands.

Global Xpress will provide higher throughput than Ku-band systems, while operating costs will be less.

The satellite deployment program is scheduled to commence in 2013, with global network coverage completed by 2014.

Very importantly for Mariners, Global Xpress has been designed for weather resistance.

*(Figure 8 & Figure 9 on page 13 provide a brief overview of Global Xpress)*
**Global Express**
- Global Ka-band coverage from 3 geostationary satellites
- Investment of $1.2 Billion
- Launches starting 2013, global network complete by 2014
- Ground segment optimised for simplified, low-cost service delivery and seamless mobility
- Higher throughput than Ku-band VSAT – up to 50Mbps to 60cm stabilised antenna
- System designed for weather resistance

**The maritime Global Xpress™ value proposition**
- Satellites and Network from One Source
- Ease of transition into Ka-band from both L and Ku
- Unique Ka and L-band bundles
- Compact, inexpensive, 'one-touch' hardware
- Higher throughput, lower cost service vs. Ku-band
- Delivered through market-leading partnerships