# Guidelines for the Prevention of Exorbitant Communication Billing

## 1. Introduction

Recently problems with marine satellite communication involving billing amounts greater than $US10,000 are on the rise.

Up until around 2009, most of these incidents were caused by **forgetting to disconnect communication transmissions**. When communications are billed on a time basis, simply forgetting to disconnect a communication can lead to being billed large sums of money. INMARSAT F-ISDN communications provide fast communication speed, however device problems or mistakes in software settings which lead to failure to terminate communication, risk resulting in charges of $US1,000 over just a few hours.

At our company we have worked to prevent such incidents by making use of MPDS communications billed based on the amount of data transmitted. This has proven effective in greatly reducing incidents where large amounts were charged due to forgetting to terminate transmissions.

However with high speed communications using INMARSAT FB, there has been an increase in a new kind of problem involving large billing amounts, even when billing is based on data volume. When billing is based on data volume, no charges should be incurred if data is not being transmitted, even if the connection has not been terminated. However data apart from email may be transmitted. The main reasons for this are outlined below.

> **(1) Automatic updates of software, which has been carelessly installed by crew or a management company.**
> **(2) Use of the Internet by crew members (either intentionally or unintentionally)**

Normally problems like these could be prevented by proper computer usage (not installing unnecessary software, being careful of virus infections etc), however due to the changing circumstances surrounding marine communications, it is becoming difficult to deal with these problems through such methods alone.

Because of this, we have put together some practical counter measures that do not rely on manner of operation.

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# 2. An Important Rule for the Prevention of Exorbitant

**The most important rule is "Cut off data communication connections when not in use".**

When communication channels are turned off, no charges can be incurred. In 100% of cases where high billing charges were incurred, the ships did not cut off the communication channels (either intentionally or unintentionally), and data transmission occurred during that time.

In cases where abnormal data transmissions occurred (automatic updates etc), charges amounted to over $US5,000 for a few hours with high speed INMARSAT FB etc.

Also, even with time-based billing connections such as INMARSAT B or F-ISDN etc, leaving the connection on by mistake for periods of time leads to high billing amounts. Normally the connection is set to cut off automatically, but on occasion the settings are unintentionally changed when crew members install un-authorized software related to communications.

90% of such incidents involving exorbitant charges can be prevented simply by ensuring that the connection is cut off when transmission is finished (confirm that the connection is cut off).

Please make "Cut off the connection when you are finished" the first major rule.

# 3. Use of Filtering

Another essential method for countering this problem is eliminating all unexpected data transmission which is not required (in this case ship's e-mail transmission). There are two kinds of data filtering. In one type filtering is **carried out by a land earth station (LES)**, while in the other type a **firewall is set up on board**.

## Judging from cases of exorbitant billing in the past, it is best to implement filtering both on board the ship and at the LES.

Firstly, filtering by the LES is very important. Because the large majority of exorbitant billing cases occurring on ships come from data downloading (from shore to ship), it is necessary to block the transmission before it is uploaded to the satellite. Generally, LES will implement filtering for no charge on request.

In order to set up a firewall device on board, it is necessary to have a full grasp of all network communications on board. Our company can make all the necessary preparations. A filter can be set up just by sending and installing our firewall. There is no need for a technician to visit the ship.

In addition, with a BIOS update, JRC FB devices can implement filtering using the INMARSAT unit itself. Please feel free to consult with us about this as well.
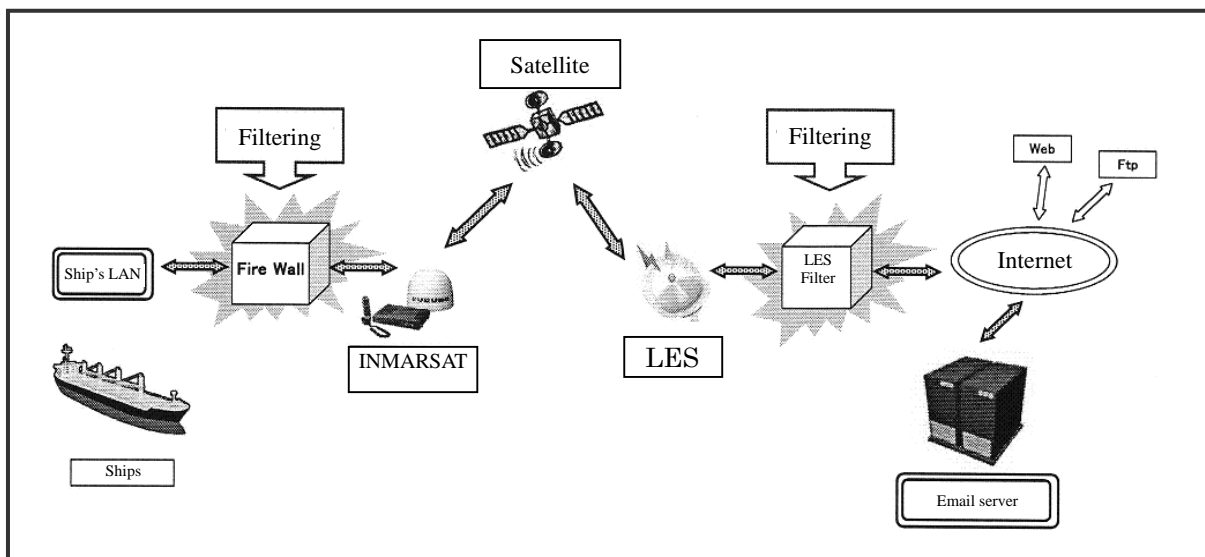


Diagram: Inter-ship communication routes

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# 4. Counter Measures for Different INMARSAT Models

### (1) INMARSAT FB and INMARSAT F (LAN connection)

First of all, apply to the LES to implement filtering. If you are using an FB you have probably already done this when you made your SIM card application, but please check if you are not sure. You can also apply later on.

Next, please install a firewall device on board the ship. If you have an FB made by JRC, it can act as a firewall if the BIOS is updated.

### (2) INMARSAT F (RS232C connection)

With an INMARSAT F connected via RS232C, a firewall cannot be set up on board the ship. You will have to rely on LES filtering, and ensuring that connections are properly cut off after use.

The INMARSAT F made by JRC (JUE-410F) can be set up to connect with a LAN, if a technician visits the ship. If the device's settings are changed to allow connection to a LAN, it is then possible to set up a firewall. If you require the highest reliability then please consider this alternative.

### (3) INMARSAT B

As the INMARSAT B operates on a time-based billing system, neither LES filtering nor firewalls can be used. In order to prevent exorbitant communication charges you will have to rely on ensuring that connections are properly cut off after use. Getting into the habit of making sure the COMM lamp is off after transmissions are finished is an effective way to do this.

*Because service for the INMARSAT B will be terminated in 2014, we strongly recommend that you switch over to the INMARSAT FB, both in order to reduce communications costs and prevent unwarranted charges. KDDI and STRATOS are currently holding campaigns for switching over to the INMARSAT FB, so please call and enquire.

# 5. Points to Note

### (1) Differences in LES filtering for the INMARSAT F and FB

In the case of the INMARSAT F, even if filtering is carried out by LES that is normally used, if the ship changes the LES, the filtering will be removed. Cases of exorbitant billing have actually occurred as a result of this. As not all LES offer filtering for the INMARSAT F, it is not practical to apply to all the LES for filtering. To be extra safe you should also install an on-board firewall.
With the FB, the LES is determined by the SIM card, so it is not possible to change to a different station.

### (2) Differences in LES filtering setting between KDDI and STRATOS （INMARSAT F Only）

When the LES filtering is implemented for the INMARSAT F, the method of application is different for KDDI and STRATOS. Only an application is necessary for KDDI to implement filtering, while STRATOS also requires that you change the settings on the ship's computer (ID and password). It is important to be aware of this.

### (3) INMARSAT FB forced routing areas

Although in principle the LES filtering can be implemented for the INMARSAT FB, in the territorial waters of certain countries (China, Australia etc) "forced routing" occurs and the applied filter becomes ineffective. Cases of exorbitant billing have occurred as a result. Please take precautions to prevent this.

### (4) Minimum charge

Some LES (STRATOS etc) require a minimum charge for data transmission. When the connection is cut off after a data transmission, a charge for 100KB of data (upload 50 KB, download 50 KB) will be made as the minimum charge, even though the transmitted data amount is much smaller.
Therefore when using these LES, if you are being careful to cut off transmissions after use, you may be billed for the "minimum charge" multiple times unnecessarily. According to the LES, there is no problem if you keep always-on connection with a filter in place, however, for example, as item (3) above indicates, keeping always-on connection involves other risks.
In the end it comes down to choosing between one of the following.

- **keep always-on connection while being aware of the risks.**
- **Cut the connection after each transmission and accept the losses due to minimum charges**
- **Use a different LES**

# 6. Conclusion

## (1) Set up a filter at the LES
## (2) Install a firewall on board
## (3) Cut off the connection after every transmission (Confirm the connection is cut off)

Implementing the three points above is the best way to prevent exorbitant communications charges.

However, it is important to be aware that due to a variety of circumstances it may not be possible to implement all of the above points, or one of them may prove to be ineffective.

Therefore, it is important to implement all available counter measures.

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## Cost for the Countermeasure

**(1) Inmarsat FBB: Bios updating & filtering setting**

   **About ¥30.000.- + Transportation cost**

   * At this time, only for Inmarsat made by JRC can be applied.

   * Updating the bios of Inmarsat to be as firewall.

   * General PC check is also done.

**(2) For Inmarsat FBB and F-Ether: Set firewall (ship's side)**

   **From ¥20,000.- up to ¥¥60,000.-**

   * the cost will be changed based on which device is required.

   * Ask us to confirm which device will adapt for each ship.

   * Setting a firewall is very simple task, so you do not need to
     send a technician to set up the device. Crew just connect the
     device between Inmarsat and a hub.

**(3) Filtering setting of LES**

   * Both KDDI and STRATOS provide their filtering service for free.

   * We also handle the applications. Please ask us if you have any
     further questions.

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# 7. Ship Communication Check List for Shipping Companies

Please use for checking the implementation of counter measures on each ship.

| | Vessel Name | Inmar Type | Inmar Maker | Inmar Device | Inmar Connection | E-mail Providor | LES | Filtering (LES side) | Firewall (Ship Side) | Remark |
|---|---|---|---|---|---|---|---|---|---|---|
| e.g. | ORCA OCEAN | F | JRC | JUE-500F | ETHER | ORCA | KDDI | KDDI Applied | JUE-500F BIOS updated | |
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*We keep track of conditions on each ship so please consult with us.

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# 8. What To Do If You Receive an Exorbitant Communications Bill

If you do receive an exorbitant communications bill, please first consult with ORCA. Be sure to take a detailed list of charges from QRC with you. We can determine if there was data transmission apart from e-mails, by comparing with our communication logs.

Most cases of exorbitant billing are only determined at the billing stage. However in many cases the problem is on-going, so it is important to take prompt counter measures.

**(1) First take measures to stop high cost data transmission**
**(2) Investigate the cause (Have a technician visit the ship, or discharge the computer to be checked)**
**(3) Take thorough counter measures against the identified a cause of a trouble**

It is important to take action in the above order. We possess know-how to handle a lot of these exorbitant communication bills problems, please do not hesitate to contact us.

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