

MALTA MARITIME AUTHORITY

MERCHANT SHIPPING DIRECTORATE

*Notice to Shipowners, Ship Operators and Managers,
Owners' representatives and Ship Masters, and Officers*

The purpose of this notice is to provide further awareness on the Year 2000 impact. General guidance is given on actions required to ensure safety and pollution prevention.

MSD Notice No 34

Preparing for Year 2000 Impact

Introduction

Y2K *problem* is the term used to describe the potential failure of information technology prior to, on or after January 1, 2000. There has been considerable publicity about the potential failure of computer systems that are unable to process the change in year date from 1999 to 2000. The problem stems from the use of two-digit year fields instead of four-digit year fields in software and hardware, and **embedded microchips**. These microchips are software driven components sewn into devices used to control, monitor or assist the operation of machinery or equipment. In many cases their presence is not apparent without detailed examination. These devices are used in a wide range of systems from vessel navigation to communication and engine and cargo control.

Y2K related difficulties would arise when the year is 00 and information technology systems are unable to differentiate between the year 2000 and the

year 1900. An associated but unrelated calendar anomaly that must also be included in Y2K system repairs is that the year 200 is a leap year.

The effect of this will be that many computer programmes and equipment will fail as they attempt to perform calculations and sorting routines because the systems and microchips will interpret the 00 as 1900 instead of 2000. The resulting inaccuracies in date-related calculations and sorting routines will generate corrupt data results that could cause systems to fail entirely. Also, if erroneous information goes unrecognised, the problem could be perpetuated through interfaces with other automated information systems. While this is the crux of the problem, it is even more complex. Many systems have faulty date logic that does not recognise the year 2000 as a leap year, other systems have triggers that their execution is based on specific values of date fields, while others have overflow or rollover problems.

For this reason, the Merchant Shipping Directorate wishes to press upon ship owners, operators and managers **the importance to take steps to identify all systems that may prejudice standards of safety or pollution prevention by failure to process a date change, and to take corrective action in good time.**

The Consequences of Date Problems for Ships

Electronics are very widely used in automation (engine room monitoring and control, cargo management etc.), navigation, and in communications on board ships. As the shipping industry has only recently started to investigate these problems it is difficult to predict the effect of year 2000 incompatibility.

Ship owners and operators must therefore accept the possibility of failures occurring and that the consequences might be serious, or indeed catastrophic. The only way to proceed is to treat all electronic systems as suspect and capable of failure or malfunction. Failure to take sufficient action or taking action too late may be regarded as constituting negligence.

Specific dates that are likely to cause problems are:

- 22/8/1999 rollover date for GPS systems

- 9/9/1999 some systems use 99 as a means of indicating the end of a file
- 1/1/2000 the digits 00 may be interpreted as meaning 1900 rather than 2000
- 29/2/2000 embedded systems which interpret 00 as meaning 1900 will not recognise the leap day because 1900 itself was not a leap year
- 31/12/2000 again, embedded systems which interpret 00 as meaning 1900 will not recognise the 366th day of the year because 1900 itself was not a leap year.

The GPS Rollover Problem

In addition to the Y2K problem, there is also concern that global positioning system (GPS) units, upon which most modern navigational systems depend, could also face problems at midnight of 21 August 1999. This is said to be caused by the overflow (or rollover) of a counter which stores the number of weeks from a base date. The GPS system time rollover at midnight 21-22 August 1999, 132 days before the turn of the millennium. Some user equipment will not be able to recognise correctly the date after this time, and this will affect the operations of such systems. Although there are a wide range of different brands of GPS units available worldwide, many of these devices share common components. This is why the extent of the problem is expected to be large, hence the need for universal testing.

Users of GPS systems are therefore advised to check immediately with the manufacturers of these units in order to ensure that they are rollover compliant.

Precautions

To address the Y2K problem on board ships the following procedures are necessary:

- All equipment and systems containing computer devices and/or embedded chips on board ships need to be identified;

- every computing device and embedded chhp needs to be tested to determine whether or not it can properly handle all dates, including day, month, and year;
- tests then need to be carried out to verify that all hardware and software that handle dates are Y2K compliant;
- in cases where problems are anticipated, suitable counter measures are to be taken and the results of such measures verified as to their effectiveness.

A suggested list of applicable equipment and systems is indicated below; this, however, may not be exhaustive:

- propulsion - engine controls, variable pitch propellers, engine auxiliaries
- electric power - generator controls, switch gear, generator auxiliaries
- steering - controls, hydraulics
- stabilisation - controls, hydraulics
- boilers
- navigation equipment
- radio equipment
- stability computers
- manoeuvring simulation
- automated discharging and loading of cargo
- passenger lifts
- in addition, requires systems such as fire detection, fire extinguishing, watertight door controls, overboard discharge monitoring equipment, etc may be affected; failures of such systems will at least contravene SOLAS certification and if undetected, may cause the system to fail to operate as required when first called upon after the date change, leading to risk to safety or risk of pollution.

It is important that all companies have *Contingency Manuals* addressing emergencies or critical problems. Manuals must be in place for every ship and for

the company in relation to each vessel. It is the responsibility of ship owners to organise their own compliance programme with the assistance of the equipment manufacturers and the ship builders where possible.

A considerable amount of time is required to implement the above steps. The Directorate trusts that ship owners, operators and managers have already achieved considerable progress.

Owners should be aware that ships found unable to provide satisfactory evidence to ascertain Y2K preparedness by Flag or Port State authorities might have action imposed upon them in relation to their legislative responsibilities. This could cause the ship being detained.

Further Information

Further information prepared by outside organisations (administrations, concerned organisations and agencies, computer related companies, etc.) may be obtained from the Ship 2000 Web Page - <http://www.ship2000.com>. This includes relevant IMO Maritime Safety Circulars (804, 869 and 894), in particular circular number 2121 which incorporates as Annex 1 - ***The Year 2000 Code of Good Practice, and Practical Guidelines for Year 2000 Contingency Planning*** produced by Lloyds's Register in association with the International Chamber of Shipping and P & I Clubs.

Merchant Shipping Directorate
Valletta

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