

Subject :

**The Year 2000 and
GPS Rollover Problems**

NKTECHNICAL INFORMATION

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To all concerned:

1. The Year 2000 Problem

The year 2000 problem, simply Y2K may cause any number of problems on computer based systems ranging from simple glitches as shown in the following table to major malfunctions as a result of being unable to properly interpret the last digits "00" or "99" used for the year. This could result in such problems as incorrect functioning of navigational systems leading to course errors, system shutdowns, or malfunctioning of recording equipment, amongst others.

Potential Dates on which Y2K Related Problems Could Occur

Problem Dates	Reason
1 / 1 / 1999 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 31 / 12 / 2000	Embedded systems which interpret "00" as meaning "1900" will not recognize the leap day 29/2/2000 because 1900 itself was not a leap year. Further related problems may occur on 31/12/2000 (the 366 th day of the year) as a result.

The primary reason for this possibility is the fact that computer systems were initially designed to use only two digits to indicate the year rather than four in order to save space in memory. As a result, computers as well as any equipment which employ embedded microprocessors that rely on two digit year dates need to be checked and action taken in advance to ensure that they are year 2000 compliant.

Given the potential impact these problems could have on ship operations of the safety of navigation and prevention of pollution, it is essential that ship management companies and any other users have their computer and microprocessor based equipment checked to ensure that they are year 2000 compliant. This includes contacting each respective manufacturer to

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determine the status of each piece of equipment on hand. Corrective action may range from revising or replacing software to repairing, replacing or even scrapping the affected device or system.

Although many estimates suggest that a major investment in time and resources may be needed to address the Y2K problem in advance, these efforts and expenses will certainly be considerably less than the insurance and legal cost that results from failing to take proper effective action beforehand. CONSEQUENTLY, IT IS A MATTER OF THE UTMOST URGENCY THAT ALL COMPANIES HAVE THEIR SYSTEMS CHECKED WITH THE MANUFACTURER OR SPECIALIZED PROVIDER TO ENSURE THAT THEY ARE Y2K COMPLIANT.

2. 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 face problems at midnight of 21 August 1999, as well. This is said to be due to an in-built error in the microchips of many of these systems which are expected to reset themselves automatically in 1999 as they reach the end of a pre-determined period of 1024 weeks of operation that started on 6 January 1980. Although there are a wide range of different brands of GPS units available worldwide, many of these devices share common components thereby being the reason why the extent of the problem is expected to be large. This also means that the need for testing is universal. 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 BEFORE AUGUST 1999.

3. ClassNK's Y2K Policy

It is the position of the Society that suitable measures to address these problems as they affect pertinent systems can only be settled by the manufacturers of the relevant systems themselves. Further, since neither Y2K or GPS rollover compliance are included in the type approval criteria of the Society for marine-related products, users are requested to obtain the cooperation of manufacturers in the handling of any Y2K related problems which may arise.

This being said, however, ClassNK is seeking to act as a source of pertinent technical information to keep ship management companies and any other users informed about these critical issues so as to encourage them to ensure that their own systems will continue to operate smoothly without

problems at the turn of the millennium.

To this end, the Society will make the following types of information available so that members of the marine community may minimize any damage that might occur as a result of problems with systems or devices with affected hardware or software.

- 1) Problems areas and measures for handling specific types of systems and equipment collected from manufacturers
- 2) Guideline for Preparing Contingency Preparedness Procedure
- 3) Various other types of information considered to be useful or effective in address these areas of concern

Further information regarding this matter can be obtained by contacting the following persons within the Society:

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