Liverpool and London Steamship Protection and Indemnity Association Limited

American Steamship Owners Mutual Protection & Indemnity Association Inc

Assuranceforeningen Gard - gjensidig

The Standard Steamship Owners' Protection & Indemnity Association (Bermuda) Ltd BIMCO (The Baltic and International Maritime Council)

Practical guidelines for Year 2000 contingency planning



The Japan Ship Owners' Mutual Protection & Indemnity Association

The Joint Hull Committee (London)

Through Transport Mutual Insurance Association Limited

The United Kingdom Mutual Steamship Assurance Association (Bermuda) Ltd

Lloyd s Register of Shipping

The Britannia Steam Ship Insurance Association Limited

North of England Protecting & Indemnity Association Ltd
The Steamship Mutual Underwriting Association (Bermuda) Ltd

ICS (The International Chamber of Shipping)

Sveriges Angfartygs Assurans Forening (The Swedish Club)

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The West of England Ship Owners Mutual Insurance Association (Luxembourg)

Practical guidelines for Year 2000 contingency planning



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	Sample Year 2000 Contingency Plan (blank form) (MS Word 6)
•••••	Sample Resource (blank form) (MS Word 6)
	Example Timetable for Ships up to and beyond the Date Change (MS Word 6)

1 Introduction

Welcome to the 'Practical Guidelines for Year 2000 Contingency Planning'.

The P&I Clubs' Ship2000TM Toolkit* and Lloyd's Register's *Guidelines for Year* 2000 projects give advice and guidance on how to address the whole issue of the "Millennium Time Bomb". The approach they recommend has been broken down into seven strategic steps:

- Awareness
- Business Risk Prioritisation
- Inventory
- Investigation
- Remedial Action Plans
- Contingency Planning
- · Review and Audit

Having previously set out the overall approach, these additional guidelines have been developed as a help to ship operators, managers and masters who are now looking to prepare their Contingency Plans. Each shipping company has the responsibility to make arrangements for contingency plans to be prepared by appropriately qualified and experienced personnel.

The guidelines have been designed to offer practical assistance. They look to answer the questions you may have about contingency planning, and to provide sample templates that you can adapt to your own needs. However, it is your ship and you know your operation best, it is therefore your responsibility to apply or modify these guidelines as is prudent in order to protect your particular or individual interests.

*The Ship2000 Toolkit was produced in 1998 to explain and manage the problem of the year 2000 date changes.

2 Contingency Planning for Year 2000 Date Changes

2.1 What is the problem?

In the early days of computing the memory resources of computer chips were very limited and computer programmers were encouraged to save disk space by storing the year as a two digit field rather than four digits. Because of this many systems will be exposed to the risk of malfunctions as their time clocks move to one second past midnight on the 1st January 2000 as they will be unable to tell if it is the year 2000 or 1900.

The manifestations of these malfunctions in both microprocessor chips and computers will be varied with some systems failing safe, others shutting down and the rest just providing incorrect data.

The focus of the Year 2000 Programme has tended to be the change from 31st December 1999 to 1st January 2000. In addition there are a number of other dates that could affect your equipment and systems. Some of these are general, e.g., the use by many programmers of 9.9.99 as a flag to denote a deleted record or end of file mark, while others, such as the GPS rollover date from 21st to 22nd August 1999, are more specific to navigation. A list of the significant dates and times – although not exhaustive – is provided in Appendix A.

This problem with various dates is known by a number of names, e.g., the Millennium Time Bomb, the Millennium Bug, Y2K Problems, EDR (Electronic Date Recognition), etc. For consistency within these guidelines we have used the term Year 2000 Date Changes. We also use the word 'rollover' to describe the point when one date turns over to the next.

2.2 What is a Year 2000 Contingency Plan?

A contingency plan is a carefully considered alternative to the usual way of operating or running part of your business and is used in times of emergency or unusual operating conditions.

When drawing up specific Year 2000 contingency plans, a good maxim to adopt would be "to expect the unexpected!" These guidelines look at two sorts of plan which are particularly relevant to the issues raised by the Year 2000 Date Changes:

- Operational contingency plans for ships and Head Office
- Crisis management plans for Head Office

Remember – a contingency plan is there to help you manage an incident if it occurs; you should already have a programme in place to try to reduce the likelihood of you being affected by the Year 2000 Date Changes. In addition there are many actions that can and should be taken prior

to the critical Year 2000 Date Changes to ensure your contingency plans are effective.

2.3 I already have general Contingency Plans in place, won't they do?

While you will already have contingency plans in place which currently satisfy your standing orders or the requirements of the International Safety Management (ISM) code (see ISM Code Section 8 – Emergency Preparedness), they may not necessarily be specific enough for the Year 2000 Date Change situation. You need to review the contingency plans you have and decide whether they meet the criteria set out in the following sections. Look at them in the context of the points raised above. For example, do your contingency plans assume speedy availability of alternative equipment, resources, etc? Might these also be affected by the Year 2000 Date Changes?

You may also find that for the Year 2000 Date Changes you need to plan at a more fundamental level. For example, you may have a plan to deal with a fire but not with loss of the fire detection system or fire fighting equipment on board or ashore. Alternatively, your contingency plan for dealing with a steering or engine failure in confined waters may depend on the availability of tugs or shore-based equipment which may also be rendered inoperative by the Year 2000 Date Change problem.

2.4 Why will I need Contingency Plans as part of my Year 2000 Programme?

Contingency plans are required in case equipment failures occurs despite all efforts beforehand to detect and fix any problems caused by the Year 2000 Date Changes. Furthermore, contingency planning is mandatory for certain types of vessels (see ISM Code Section 8 – Emergency Preparedness) and, as far as Year 2000 is concerned, may well be considered obligatory in order to satisfy "due diligence" requirements.

These failures could happen for a number of reasons:

- They are unforeseen and have not been considered
- They were not detected during compliance tests
- Testing has not been completed in time
- Fixes have not been applied in time
- Equipment that has been tested and/or fixed, has still failed

You must also remember that this is a world-wide problem and that it may not be your equipment that fails.

For example:

- One of your suppliers, or another third party that you deal with, may have a problem that affects your operations directly or indirectly
- There may be general disruption to services and infrastructure upon which you are normally reliant, e.g., telecommunications, transport
- However well you are prepared, another party with whom you or your vessel interact may not be

2.5 What else is special about the Year 2000 Date Changes?

There are a number of factors which are unique about the sorts of problems that may arise as a result of the Year 2000 Date Changes:

- We know the dates around which incidents are likely to occur, although not precisely when, as internal clocks may be set at different times or a system may use Year 2000 dates before or after the actual date
- You could need to deal with many different incidents at one time, potentially on a world-wide scale
- Much of the infrastructure on which you would normally depend in an emergency situation may itself be affected by the Year 2000 Date Changes

2.6 When will I need my plans in place?

The earliest dates that may affect you are well before 1st January 2000 (see Appendix A for a list of significant dates). It must also be remembered that for a contingency plan to be meaningful and worthwhile, the plan must have been tested well before any critical date to ensure that it works. With this in mind there is an urgent need to prepare contingency plans now.

2.7 Will I need a plan for every piece of equipment that I have identified?

No. Generally, contingency plans will only be required for those systems where failure would have a high or medium level of impact. Appendix B provides a suggested definition of High, Medium and Low impact levels, while Appendix C gives a list of systems that could possibly be vulnerable to Year 2000 malfunctions.

However, the impact is not only determined by the type of equipment that can be affected. In many instances, the activity in which the ship will be engaged at a particular time can determine whether the consequence is high or medium or even low. For example, a potential consequence of a steering gear failure whilst the ship is in calm, open waters is likely to be less severe than the consequence of such a failure when the vessel is proceeding in a confined waterway. However, in both instances, the incident has been caused by the same failure to the same equipment.

You will need to decide where plans need to be put in place. Section three of these guidelines will help you with this prioritisation.

2.8 Can I reduce my risk?

Yes, you can make conscious decisions that will reduce the risk of your business being affected by the Year 2000 Date Change. For instance, adherence to the "Year 2000 Code of Good Practice" could do much to reduce the degree of threat posed by Year 2000 malfunctions (see Appendix D for details of the Code).

The Code suggests, amongst other things, the following procedures for shipowner's consideration:

- The location of the ship can affect the impact of any failure. Options are to stay out in open water, in port, avoid busy or restricted channels, etc
- Avoid certain operations, such as loading/unloading cargo, bunkering, etc. until you have been able to verify systems after the date rollover

In addition, other risk reducing procedures could be beneficial, such as:

- shutting down unnecessary equipment until you are able to confirm current operation after the rollover and
- ensuring that the ship's crew has received sufficient training and practise in relation to the manual operation of the ship's deck, engine room and navigation equipment

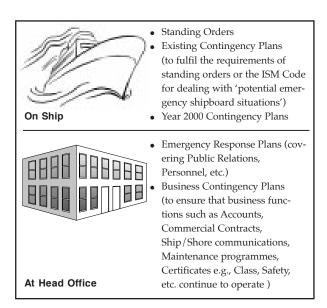
These decisions need to be considered well ahead of time and communicated throughout your fleet.

Having said this, the single most effective way of reducing the risk to your business is to put in place a proper Year 2000 Programme. This will help you to identify where you are vulnerable and to draw up plans to resolve as many of the potential problems as possible before the Date Change becomes an issue. If you would like further advice and guidance on how to go about such a programme then please see the P&I Clubs' Ship2000TM Toolkit and/or Lloyd's Register's "Guidelines for Year 2000 projects".

2.9 Will I need plans at Head Office as well as on my ships?

Yes, your Head Office functions are just as vulnerable to the Year 2000 Date Changes as the operations on your ships. You must also remember that you will need to provide coordination for any incidents that do occur on your ships, as well as protecting your company's image if the incidents are serious; this is best done through a pre-prepared Crisis Management Plan.

The following diagram shows the level of plans that are needed:



3 Preparing Year 2000 Contingency Plans for the Ship

What should be in my plan?

The plan should allow you to answer a series of questions:

- What might go wrong (both in my operation and in that of any third party I deal with)?
- What activity is likely to be affected?
- How critical is this activity/function to the operation of my ship?
- How else can I perform this function?
- Could any of the alternative ways of working also be affected?
- Who will make the decision to change to the alternative method of working?
- Do I already have procedures to cover this alternate way of working?
- Do I need any specialised equipment to operate in this alternative way?
- Do my crew need any special skills or training to operate in this alternative way?
- Will I need any particular information to be able to operate in this alternative way?
- What provision do I need to make ahead of time to prepare for the alternative way of working?
- Are there any "knock-on" effects of either the initial failure, or my solution?
- If there are no alternatives, can I contain the situation?
- Who needs to know what has happened?
- How will I communicate with them?

The Eight Steps



The eight-step approach illustrated above and described below can be employed in formulating a successful Year 2000 contingency plan.

3.1 Step One - Define Impacts

Before you start to construct your plans there is one question you must answer, and that is:

"What particular incidents am I going to plan for?"

Firstly, you must consider the level at which your plans will be written. Given the number of potential failures that could occur, it is sensible that you concentrate on the impact any failures are likely to have. For example, a number of electronic components and systems are normally used to steer the ship. Rather than have a plan based on the failure of each individual element, it may be more effective to build a plan around the total loss of steering. This will allow you to clearly identify, in a worst case, the capability of manual intervention.

If you have completed an inventory as part of your Year 2000 programme you may find it useful to go back to that list and identify the consequences of failure. As well as the failures on the ship you also need to consider the impact of failures at the ports (i.e. Vessel Traffic Systems, etc), with ship's agents, customers, freight forwarders and other third parties that you deal with. For example, what if cargo is late arriving at the docks, what if automated locks are malfunctioning? All of these failures could affect your business.

The level of impact* caused by a system or equipment failure will also be affected by the location of the ship at the time and the operations that are being carried out (e.g., working cargo). For example, a problem with steering or propulsion will be more critical if it occurs when you are in congested or otherwise restricted waters. You must therefore remember that although you can assign a level of impact during the planning phase, this should be reviewed when more clear information becomes available about the ship's likely location and activity at the date change to ensure that it is applicable at that time. In terms of levels of impact a straightforward High/Medium/Low assessment (see Appendix B) should be adequate, as long as it is clear what each level of impact means, and that the levels are applied consistently.

Plans for disruption of any activity over the Year 2000 period should concentrate more on the medium to high level impacts.

*The degree of impact should be measured against the criteria of business, safety and the protection of the environment.

3.2 Step Two – Identifying Alternative Methods of Working

Where appropriate you need to identify alternative methods of working. For each alternative you need to clearly define the circumstances under which you would initiate it.

In some cases you may wish to identify more than one alternative method of working, e.g., if your first option may itself be affected by the Year 2000 Date Change. You should also consider what you would do to contain the situation if there are no alternatives or if all the alternatives have been exhausted.

3.3 Step Three – Implementing the Alternative Methods of Working

For each alternative method of working list the actions that would need to be taken, and by whom, to initiate the alternative.

3.4 Step Four – Identifying the Resource Requirements

Consider the resources you will need to allow you to perform your alternative methods of operating. This should include staff, skills, equipment, instructions, and information.

3.5 Step Five – Documenting Your Year 2000 Contingency Plans

To assist you to prepare Year 2000 contingency plans for the ship a plan template has been developed.

The plan template has been designed with three purposes in mind:

- 1 To describe clearly the alternative methods of working that you have identified and to detail the actions to be followed should you need to implement the plan
- 2 To record decisions and actions taken if you actually implement the plan
- 3 To identify the resources required to implement the plan and the preparations that must be made if the plan is to be used effectively

Once you have identified the situations you are planning for you can begin to fill in the details on the plan template. In Appendix E you will find a blank template, a copy of the template with instructions in each box to assist you to complete the document, plus four worked examples.

3.6 Step Six – Consolidating Resource Requirements

As you complete each plan (Appendix E) you will identify the resources that are required to operate each alternative method of working. The next step is to consolidate all these resources so that you can ensure that you have them available should you require them. Dependent on the number of plans you have constructed, and the size of your operation, it may be helpful to pull all the resource requirements together in a single document; this will assist your Year 2000 Date Change preparation if you need to confirm the availability of additional resources. If you wish to do this a sample table is provided in Appendix F.

Remember some resources may need to be brought on to the ship in the time leading up to the Year 2000 Date Change, you must therefore make preparations in advance. This is particularly relevant if you will need extra crew to operate any of the alternative methods of working. You should also remember that the presence of extra personnel on board may require additional accommodation, lifeboat space, etc, bearing in mind statutory requirements.

3.7 Step Seven – Gathering Supporting Information

As part of the planning process, you will have identified the information that you will need available if you have to implement any one of the plans. At this stage you should also consider what other supporting information – which

may already be in your general contingency plans – you could need, such as the contact details of:

- Suppliers
- Company Agents
- Port State Authorities
- Head Office Emergency Centre
- Insurance Agents and P&I Correspondents

Once you have decided what information you need to have to hand, set about collecting it and making sure that the crew know where it is held. If certain information is particularly relevant to one of your plans, it would be sensible that it is also recorded within the plan.

3.8 Step Eight – Prepare a Pre and Post Date Change Timetable

To assist in your preparation for the Year 2000 Date Changes we would suggest that you draw up a timetable of the activities identified during the planning process that you need to undertake leading up to, and beyond, each rollover period. This timetable should include:

- Drills to be carried out to ensure staff are familiar with alternative methods of operation
- Checks to ensure that alternative equipment is functioning properly
- Any prudent actions to be undertaken to reduce risk during the rollover period (i.e. switch to manual operation). The time of implementation should be on the timetable
- Information to be sent to, or received from, Head Office
- Checks to be made after the rollover to ascertain whether equipment and systems are functioning properly

An example timetable is provided in Appendix G.

4 Preparing at Head Office

Preparation at Head Office falls into three distinct areas:

- Providing guidance for ships on the preparations and actions that you expect them to take
- Developing Emergency Response/Crisis Management Plans
- Notifying interested parties of the contents of your contingency plans

4.1 Guidance for Ships

The Head Office has an important role in instructing Masters on how you expect them to prepare for, and operate during, the Year 2000 Date Change periods. In terms of preparations the following areas should be considered:

Contingency Plans

You should instruct your Masters to carefully consider the plans that they need to implement if they are hit by equipment or system failure as a result of Year 2000 Date Changes. If there are existing contingency plans in place they need to be reviewed to make sure that they are suitable to deal with the unique factors which will be operating during this period.

Crewing Levels

It is possible that additional crew members may be needed, which may in turn require additional accommodation. New crew members will also require some time to familiarise themselves with the vessel. You should therefore consider careful control of crew relief immediately prior to any date change. If the additional human resources are catered for by staff overtime, consideration should be given to the 'fatigue factor' if the emergency should stretch over a prolonged period.

Prudent Actions and Good Practice

You should assist your Masters by identifying the prudent actions that you expect them to take during the Year 2000 Date Change periods. You may decide that such instructions should encompass "The Year 2000 Code of Good Practice" (see Appendix D). This Code recommends measures whereby those responsible for ship and port operations can reduce the risks associated with the possible Year 2000 malfunctions by avoiding placing the vessel in situations of danger

Emergency Response

Make sure your Masters are fully aware of the emergency response procedures that you have put in place and understand how communication must be routed in the event of an incident.

4.2 Emergency Response

In the event of an incident, or a number of incidents, affecting either your ships or your head office it is important that you have a pre-prepared plan for dealing with the emergency.

The areas you should consider are:

Organisational Structure

Who needs to be involved in managing the incident? This will depend on the sorts of decisions that need to be made. Typically people covering the following functions need to be considered:

- Senior Management
- Technical and Operations
- Public Relations
- Personnel

It is normally helpful to identify an Emergency Response Team and ensure that the individuals are available and know that they are part of the team and what will be expected of them. You should also appoint alternative members in case someone is unavailable.

Control Centre

This is the location from which the emergency will be coordinated. It needs to be an environment that will provide the Emergency Response team with the resources they will require in terms of internal and external communications, information, support tools and backup staff.

The Emergency Response Team needs to be able to focus on the problems that they are addressing so it is important that the control centre is separate from the normal operations area. However, it will be vital that decisions are implemented quickly and there should therefore be clear lines of communication between the Emergency Response Team, the rest of Head Office and the ship(s).

Incident Response Actions

Typical actions that need to be thought through are:

- How will staff be notified that there is an incident? Given the nature of any Date Change problems you will need to decide whether you will have personnel on stand by at the Control Centre, or not
- Who is responsible for what?
- Who will make decisions?
- How will those decisions be communicated?
- Does the plan envisage the threat of a "cluster" of Year 2000 incidents all happening within a short space of time?
- Should you consider initiating a procedure to pass on the experiences of your ships in the Eastern Hemisphere to those yet to pass through the critical times and dates?
- Are your local travel arrangements likely to be frustrated by Year 2000 malfunctions
- Will your own office security systems deny you access to your office building?
- What will be the impact on your office and/or Emergency Control Centre of any Year 2000 infrastructure failures to power supplies, communications, etc?

Communications Statements

In the event of a serious incident the messages you give to the outside world will be vitally important. You should consider preparing basic statements that could then be tailored to suit the incident if they are needed.

Additional Personnel

The Emergency Response Team may require support staff to assist them by taking messages, operating the telex, etc.

You should also consider how you would deal with an emergency that goes on over a longer period. The Emergency Response Team will become less effective as they get tired, therefore you need to know who will relieve them and how any handover of responsibility will be managed.

In addition to your own personnel you may need to bring in specialist expertise (e.g. electronic or IT expertise, etc). Your Emergency Response Plan should detail how you would obtain such skills.

Key Information

You should consider the information that the Emergency Response Team may require. If possible this should be prepared ahead of the date change rollover periods so that it is immediately available. If the information changes on a regular basis then make sure that staff know where to obtain the latest version.

The information to consider includes the records of your Year 2000 compliance program and contact details for:

- All staff
- Agents
- Port State Contacts
- Flag State Contacts
- Insurance Agents and P&I Correspondents

For the date change rollover you may wish to print out all key information rather than relying on access to electronic systems that may themselves be affected.

4.3 Notification to Interested Parties

You should consider if there are other people or organisations who need to be aware of the content of your contingency plans. For example:

- Charterers
- Agents
- Owners
- Ports
- Insurers

• Cargo Interests

5 Legal Implications

A paper prepared by Richard Williams of Ince & Co.

- 1 The Year 2000 Date Changes are a real and foreseeable threat to shipping. A ship operator will, therefore, be expected to demonstrate that he is operating his vessel in a manner which a reasonably competent mariner would consider prudent in the light of such threat and that, in particular, he has a prudent contingency plan in the event of the threat becoming a reality.
- 2 The operator's duties can in many ways be equated to those of a car driver. The latter has a duty to ensure that he takes adequate safeguards in relation to the safety and structural integrity of his vehicle and to drive it in a safe manner along the public highway. However, in determining what is a safe way to operate his vehicle, he is deemed to know, firstly, that even if he has properly checked his vehicle that vehicle may still suffer from latent defects which may render its operation unsafe at any moment. Secondly, and just as importantly, that other vehicles which he will encounter may also suffer from defects, either latent or patent, and may furthermore, be operated in a manner which is potentially dangerous both to his vehicle and to other third parties both on and off the highway. Therefore, in order to demonstrate that he has operated the vehicle in a prudent manner, he must demonstrate that he has taken account of all of these various problems, some of which may not be within his direct control.
- 3 It will be obvious that in the case of vessels, the potential results of the failure to operate the vessel in such a prudent manner can be far more serious.
- 4 Since an operator does have ongoing responsibilities, he cannot ignore the possibility that difficulties may arise on or near material dates (see Appendix A). Therefore, if the vessel is operated in a manner which takes no account whatsoever of these possibilities, the operator can expect to incur liabilities. Indeed, "turning a blind eye" to the risk is dangerous. As Lord Denning M.R. said in the *Eursythenes* (1976) 179:

"If a man, suspicious of the truth turns a blind eye to it, and refrains from enquiring – so that he should not know it for certain – then he is to be regarded as knowing the truth. This "turning a blind eye" is far more blameworthy than mere negligence."

5 An operator will be expected, firstly, to have exercised due diligence to identify and where feasible, eliminate or minimise the Year 2000 Date Change problem insofar as it affects equipment or components within his own control. A very substantial body of information identifying and explaining the problem has, together with advice and recommendations, already been made freely available in many forms and ship operators will be expected to have availed themselves of this information and assistance. Failure either to do so or, having done so, to take the appropriate action, will probably be treated as evidence of failure to exercise the requisite degree of due diligence.

- 6 Even if the operator can demonstrate that he has exercised the requisite degree of due diligence in this regard, this does not mean that he will necessarily face no further problems or, indeed, have no further responsibilities. The nature of the problem is such that notwithstanding the fact that prudent investigative and remedial action has been taken before the relevant deadline, there can be no guarantee that all potential Year 2000 Date Change problems will, in fact, have been eliminated. A residual risk is, therefore, foreseeable and a ship operator will have ongoing responsibilities to operate his vessel in a manner which takes account of this residual risk.
- 7 Therefore, a ship operator has a duty to demonstrate that he has prepared a contingency plan which a reasonably prudent mariner would consider to be satisfactory in eliminating or, at least, minimising Year 2000 Date Change risks. However, the fact that there are already contingency plans of a general nature in place is not likely to be treated as sufficient. The Year 2000 Date Change problem is a specific risk of a particular kind which is foreseeable. It therefore requires specific attention and a specific Year 2000 Date Change contingency plan.
- 8 The fact that a specific contingency plan has been prepared is not itself likely to be treated as sufficient. It must also be shown that:
 - (a) the plan has been tested and, where necessary, modified to obtain the best protection;
 - (b) the plan has been practised; and
 - (c) that the relevant personnel have received satisfactory instruction in relation to its operation.
- 9 Operators who cannot demonstrate that they have prepared a satisfactory contingency plan may well be held not to have exercised due diligence and also run the risk that:
 - (a) they will be held liable for loss, personal injury or damage, or for damage to the environment caused by their vessel:
 - (b) they will not have insurance cover:
 - (i) for damage to or loss of their own property; and
 - (ii) for liability for loss, personal injury or damage, or damage to the environment caused by their vessel.
 - (c) a court or tribunal will conclude that their conduct is sufficiently serious to prevent them from being able to limit their liability for such loss, personal injury or damage, or damage to the environment;
 - (d) they will have to bear the cost of delays to the vessel caused by the refusal of third parties or authorities to allow her to trade normally;
 - (e) their contracting parties will treat such conduct as sufficiently serious either to justify termination of existing contracts or to refuse to enter into new contracts.

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The author is a partner in Ince & Co Solicitors of London. Telephone +44 171 623 2011, Fax +44 171 623 3225, e-mail richard.williams@ince.co.uk

Ince & Co has offices in Hong Kong and Singapore as well as a consultancy in Piraeus. It has an extensive and long established network of maritime lawyers world-wide.

6 Conclusion

This document has highlighted the unique nature of the Year 2000 problem and directed your thoughts towards specific actions that will reduce the chances of a Year 2000 malfunction causing you an embarrassment or even a catastrophe.

There is still the overriding need to check and fix all of your systems and equipment and Year 2000 contingency planning is no substitute for that process. However, it is a vital part of the overall programme and can be considered as something of a last line of defence.

There is no doubt that the Code of Good Practice (see Appendix D) represents a high level of prudence and may be used as part of Year 2000 Contingency Planning. Nevertheless, in addition to the Code, there are many more low level operational plans and procedures that can further reduce your vulnerability to Year 2000 failures and it is hoped that this document helps you identify those that are applicable to you.

This is not meant as a prescriptive format for your Year 2000 contingency plans. Every organisation has specific requirements that can only be addressed by individual plans or procedures. Here, we have attempted to provide you with a framework to operate within and some thought provoking examples that may be of assistance to you in identifying your own unique requirements.

Appendix A: Significant Dates

Date	Description
22.08.1999	GPS rolls back to 06.01.1980 (uses 1024 week cycle)
09.09.1999	9.9.99 flags for record deletion/end of file mark?
31.12.1999 – 01.01.2000	This is the basic millennium rollover
01.01.2000	Overflows 2 digit years
28.02.2000 – 29.02.2000	The first leap year rollover in the new millennium
29.02.2000 - 01.03.2000	The second leap year rollover in the new millennium
31.12.2000	366th day of year 2000
01.01.2001	First day of 21st Century
29.02.2001	Should not exist, 2001 is not a leap year
01.03.2001	Should immediately follow 28.02.2001

This is not an exhaustive list but it is a representation of the dates that are generally held as being the more significant.

Appendix B: Impact Levels

The first task is to define levels of impact of a failure. For simplicity three levels, high, medium and low, can be chosen.

The three levels suggested here are as follows:

High Impact

Failure could cause loss of a vessel, a collision, a major pollution incident, a serious threat to company survival or loss of life

Medium Impact

Failure could cause delays to operations, commercial penalties or fines for pollution

• Low Impact

Failure merely causes extra work and inconvenience

Appendix C: Vulnerable Equipment

Where could problems be found?

This list is an indication of the equipment found on board ships that could embody embedded systems which could be vulnerable. The list is not intended to be either comprehensive or exhaustive.

Navigation

Position Fixing Steering Manoeuvring

Propulsion and Utilities

Engine Control and Monitoring Electrical Power Generation Emergency Power Generation

Safety

Fire Protection Gas Detection Flooding Control Position Warning Lifesaving Appliances

Business Services

Office Services
Client Services

Maintenance and repair

Communications

External Internal

Environment

Pollution Prevention Bunkering

Crew and Passenger Services

Catering
Domestic
Leisure
Hygiene
Environment
Medical
Passenger Lifts
Security Stores

Cargo Management

Load/Unload Monitoring

This list is based upon the schedule appearing in Appendix 2 to Annex 2 of the IMO Circular letter No.2121, dated 5th March 1999.

Appendix D: The Year 2000 Code of Good Practice

The Code of Good Practice has been distributed by the International Maritime Organisation under their Circular letter No. 2121 dated 5th March 1999

ANNEX 1

THE YEAR 2000 CODE OF GOOD PRACTICE

Introduction

- The Year 2000 problem, sometimes referred to simply as Y2K, is the term used to describe the potential electronic date recognition (EDR) failure of information technology systems prior to, on or after 1 January 2000. The potential exists because of the widespread practice of using two digits, not four, to represent the year in computer databases, software applications and hardware chips. For example, difficulty will arise in the year 2000 when machines may be unable to differentiate it from the year 1900. As a result, microchip-based systems may function incorrectly, or not at all.
- The equipment involved may be as simple as a clock as sophisticated as the monitoring and control system for the main engine plant; or as complex as a port's vessel traffic system. All affected parties must assess the extent of the problem in their operations, prioritize potentially non-complaint units/systems and decide on the correct action. Depending on the system, equipment or software involved the correct action may be to repair it, replace it, or use alternative systems or manual operations.
- Awareness of the nature and extent of the problem is critical in correcting it. The problem does not reside merely in mainframe or personal computer systems. It also affects programmes embedded in any microchip based system. One of the first steps in addressing the problem is to conduct an inventory of equipment that may be affected in order to establish whether or not software and hardware are Year 2000 compliant. Failure to identify and correct systems that could be affected by the Year 2000 problem could result in serious safety problems, such as unexpected shutdown of the main engines and ships' navigation systems or a breakdown in communications, or loss of shore utility services.
- This Code of Good Practice recognises that the risk of unforeseen Year 2000-related failures cannot be totally discounted, notwithstanding that all proper steps to rectify possible Year 2000 problems may have been taken. It is vital, therefore, that ship operators, port authority and terminal operators identify and put in place operational contingency plans to ensure that safety is not compromised in the event of an unforeseen Year 2000 equipment or system malfunction. The Code acknowledges the need to exchange information and assurances relating to the measures and precautions taken by shipping companies and ports, respectively, if navigation and port operations are to continue during Year 2000 critical periods.

Elements of the Code of Good Practice

- The Code recommends measures whereby those responsible for ship, port and terminal operations can reduce the risks associated with the possible malfunction of equipment incorporating "embedded systems", as well as computer equipment, which may be dependent on electronic date recognition. It stresses the importance of:
 - the shipmaster's freedom to use his professional judgement in accordance with SOLAS regulation $\text{V/}10\text{-}1^*$

The master shall not be constrained by the shipowner, charterer or any other person from taking any decision which, in the professional judgement of the master, is necessary for safe navigation, in particular in severe weather and in heavy seas.

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^{*} SOLAS Chapter V (Safety of Navigation), regulation 10-1: Master's discretion for safe navigation

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- •- the shipowner's master's, port authority's and terminal operator's respective responsibilities for safety and the environment;
- compliance with rules and recommendations covering such matters as passage planning, maintaining appropriate margins of safety in case of breakdown, and prompt reporting when so required;
- the exchange of information between involved parties so as to ensure that all concerned are fully informed and that the measures that have been taken are appropriate to the circumstances; and
- the provision of suitable additional training, where appropriate.
- The Code is not intended to preclude the adoption of other measures by individual shipping companies, port authorities and terminal operators, nor does it relieve those responsible of their duty to use their discretion in light of the many factors which contribute to safety and pollution prevention.
- It is recommended that, for the duration of any period when there may be date induced uncertainty as to the performance or functionality of computer systems, electronic and electro-mechanical or similar equipment, the following precautions should be adopted:
 - .1 Sufficient competent personnel should be available on ships and within ports and terminals to monitor and maintain extra vigilance on critical systems and operations, and respond immediately to equipment failures during the Year 2000 critical periods. Furthermore, if it is planned to introduce operational contingency plans in excess of normal practice, it is important that staff are fully trained and exercised in the implementation of such plans.
 - .2 Prior to entering confined or congested waters and areas where hazards to navigation exist, the master, taking into account the prevailing circumstances and any advice or instructions received, should decide on the appropriate action to be taken to ensure the continued safety of his ship, crew, passengers and cargo, bearing in mind that not only the ship, but other ships in the vicinity, could lose power, steering or the use of electronic navigation equipment. If the master deems that the safety of the ship is at risk, the master should consider measures to minimize the risk by such means as reducing speed, delaying entry to the port or steering an alternative course.
 - .3 The port or terminal may obtain information in advance from ship operators in accordance with the questionnaire in Appendix 1. Prior to arrival in or departure from a port or terminal, or before entering port limits, information from authorized personnel should be exchanged by appropriate means between the ship and the port or terminal, as provided for in the questionnaires in Appendices 2 and 3.
 - .4 Prior to a ship entering or navigating within a port, the port authority or terminal operator should advise the ship of any additional conditions or constraints on navigation or cargo handling that the port authority or terminal operator has decided are necessary in order to minimize the risks associated with any Year 2000 equipment malfunction. Such measures might include minimum separation between ships, speed constraints, the use of tugs, loading/discharge restrictions, etc.

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- .5 If, after exchanging information, and prior to commencing cargo handling or bunkering operations, there is doubt whether the planned operation can be conducted safely, and without hazard to the environment, property or personnel, the master, port authority or terminal operator should within their respective scope of responsibility, postpone or suspend the operation until the risk of Year 2000 equipment malfunction has passed.
- .6 Following a Year 2000 critical period, all equipment not used during that period, and potentially affected by electronic date recognition problems, should be tested to ensure that its performance has not been adversely affected.

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	APPENDIX 1		
YE	AR 2000 QUESTIONNAIRE 1		
From: (Port Authority/Terminal Ope	erator)		
Name:	Position:		
Γο: (Name of Ship Operating Con	npany)		
Please answer the following question company is expected to arrive at, opera date induced uncertainty as to the pe electro-mechanical or similar equipn	tte in, or depart the above port during rformance or functionality of con	ig a period when the	ere might l
Person responsible for Year 2000 Poli Co	Position: Position: Ontact Address:		
Ship Name(s)/IMO No(s): Ship Type(s):	1 2 3		
mp 1, pc(8).	2.		
		Delete as ap	propriate
1) Does your company have a docume	ented Year 2000 policy in place?	YES	NO
2) Have inventory checks for each ship potentially non-compliant equipme		gorize YES	NO
3) Has equipment critical to the operation and have appropriate remedial action		gated,	
NT : .: 10 .	?	YES	NO
- Navigational Systems		YES	NO
- Navigational Systems - Propulsion and Power	Generation Systems?	113	
	<u> </u>	YES	NO
- Propulsion and Power	oment?		NO NO
- Propulsion and Power - Cargo Handling Equip - Other Safety Equipme 4) Are records of Year 2000 compliant	oment? ent?	YES YES YES	
- Propulsion and Power - Cargo Handling Equip - Other Safety Equipme 4) Are records of Year 2000 compliant tests/investigations, documented and	oment? ent? ence, and/or the results of equipment d available for inspection by the Port	YES YES YES	NO

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APPENDIX 2

From: (Port Authority/Terminal Operator Co: (Name of Ships) Please answer the following as fully as you co Authority/Terminal Operator in deciding was quipment failure caused by Year 2000 electroning of the contingency plans to cope with unforeseen	an. Your response to this questions whether due care has been exercis ctronic date recognition problems,	ed in avoidi	ng possibl
Company: Chip's IMO Number: Connage (gross): Date/time of expected arrival/departure:	Flag: Ship Type (e.g. ro-ro, cargo):		
		Delete as ap	propriate
1) Does your company have a documented Y	ear 2000 policy in place?	YES	NO
2) Has an inventory check to identify and c equipment been carried out?	rategorize potentially non-compliant	YES	NO
 Has equipment critical to the operational sa and have appropriate remedial actions been 			
- Navigational Systems?		YES	NO
- Propulsion and Power Gener	ration Systems?	YES	NO
- Cargo Handling Equipment?		YES	NO
- Other Safety Equipment?		YES	NO
4) Are records of Year 2000 compliance, and tests/investigations documented?	d/or the results of equipment	YES	NO
5) Are the above documents available onboa port authority/terminal operator?	rd the ship for inspection by the	YES	NO
6) Does the ship have a documented Year 20 including competent personnel to implement		YES	NO
7) Has the ship's Year 2000 contingency plan been tested and reviewed to confirm its effectiveness?		YES	NO
8) Has the ship's equipment not currently in the ship, been checked to establish that its affected?		YES	NO
9) Has all necessary information been exchanamed port/terminal on any additional Ye applicable to ship operations in the port?		YES	NO

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APPENDIX 3

YEAR 2000 QUESTIONNAIRE 3		
From: (Ship/Shipping Company)		
To: (Port Authority/Terminal Operator)		
Date/time of expected arrival/departure:		
It is anticipated that the above ship will/may require to navigate or handle carge around the above dates. Please complete the following questions concerning the made by the Port Authority/Terminal Operator.		
	Delete as ap	propriate
1) Does the Port Authority/Terminal Operator have a documented Year 2000 policy in place?	YES	NO
Has an inventory check to identify and categorize non-compliant equipment been carried out?	YES	NO
3) Has all equipment critical to the safety of navigation/cargo handling been assessed for Year 2000 compliance?	YES	NO
4) Has the Port Authority/Terminal Operator investigated potential problems and solutions?	YES	NO
5) Where non-compliant equipment has not been replaced or upgraded have alternative systems or manual operations been established?	YES	NO
6) Has the Port Authority/Terminal Operator sought to establish whether its critical suppliers, utilities and external services are Year 2000 compliant?	YES	NO
7) Is there serious doubt as to the availability of any supply, utility or service which is critical to safety?	YES	NO
8) Does the Port Authority/Terminal Operator have operational contingency plans in place to cope with unforeseen Year 2000 equipment malfunctions?	YES	NO
Have these contingency plans been tested and reviewed to confirm their effectiveness?	YES	NO
10) Has all necessary information been exchanged and agreed with the ship/shipping company on any additional Year 2000 specific requirements applicable to port/terminal operations?	YES	NO
Name: Position: Contact Address:		
Signature: Date:		

Appendix E1: Sample Year 2000 Contingency Plan (blank form)

Operation Affected	The operation / function that may be affected, e.g. navigation, steering, unloading, etc	
	Details	
Impact at Rollover Date		
Alternative Method of Working 1		
Alternative Method of Working 2 (if appropriate)		
Containment Measures if Alternative Methods Fail		
	Alternative Method of Working 1	Completed
Actions		
	Alternative Method of Working 2	Completed
Actions		

RESOURCE REQUIF	REMENTS FOR ALTERNATIVE METHODS	Available/Location
Procedure(s) to be followed		
Equipment Required		
Skills Required		
Manpower Required		
Information Required		

PREPARATION PRICE	OR TO ROLLOVER DATE	Completed
Equipment Checked		
Staff Trained		
Alternate Method of Working Practised		
Instructions / Procedures Reviewed		

Appendix E2: Sample Year 2000 Contingency Plan (with instructions for completion)

Operation Affected	The operation / function that may be affected, e.g. navigation, steering, unloading, etc		
	Details		
Impact at Rollover Date	The impact of a failure of this function/operation on the Rollover Da as early as possible, although it is recognised that impact can be affect ship on the date	_	
Alternative Method of Working 1	Your preferred alternative method of working		
Alternative Method of Working 2 (if appropriate)	A second alternative method of working (in case your first options is the Rollover Date)	s itself affected by	
Containment Measures if Alternative Methods Fail	If your alternative method of working fails, or there are no alternatives available, what you would to do to contain the situation		
	Alternative Method of Working 1	Completed	
Actions	A list of the actions that will need to be taken to operate the alternative method identified above	The date and time each action was completed	
	Alternative Method of Working 2	Completed	
Actions			

RESOURCE REQUIREMENTS FOR ALTERNATIVE METHODS		Available/Location
Procedure(s) to be followed	Details of any documented procedures to be used in implementing the alternative method of working	Date confirmed available and location
Equipment Required	Details of the equipment required to implement the alternative method of working	Date confirmed available and location
Skills Required	Skills Required Details of the skills required to implement the alternative method of working	Date confirmed available and location
Manpower Required	Details of the manpower (members of staff over time) required to implement the alternative method of working	Date confirmed available and location
Information Required	Details of any information required to implement the alternative method of working	Date confirmed available and location

PREPARATION PRIOR TO ROLLOVER DATE		Completed
Equipment Checked	Checks to be made to the equipment identified above	Date Initials
Staff Trained	Training required and details of who has been trained and when they were trained	Date Initials
Alternate Method of Working Practised	Drills performed to ensure that alternative method of working can be implemented effectively	Date Initials
Instructions / Procedures Reviewed	Review of any instructions or procedures to ensure that they meet the specific needs of the date rollover	Date Initials

Appendix E3: Year 2000 Contingency Plans Examples

Operation Affected	RADAR FAILURE	
	Details	
Impact at Rollover Date	High impact: • All waters in reduced visibility • Coastal waters Low impact in deep sea and good visibility	
Alternative Method of Working 1	Post extra lookout Reconsider assessment of ship's safe speed Reconsider point of landfall or safe passing distance off coast	
Alternative Method of Working 2 (if appropriate)	Not applicable	
Containment Measures if Alternative Methods Fail	Proceed safely to anchorage	
	Alternative Method of Working 1	Completed
Actions	Call master Call extra lookout Advise engine room of radar failure If necessary: • engines on standby • adjust safe speed • adjust passage plan taking into account the availability of other shipborne and land-based aids to navigation	
	Alternative Method of Working 2	Completed
Actions	Not applicable	

RESOURCE REQUIR	REMENTS FOR ALTERNATIVE METHODS	Available/Location
Procedure(s) to be followed	Standard navigational bridge procedures	
Equipment Required	No additional navigation equipment required	
Skills Required	Knowledge, training and practice in collision avoidance situations and navigating in coastal waters without the aid of radar	
Manpower Required	Extra lookout	
Information Required	Standard nautical charts and publications	

PREPARATION PRIC	PREPARATION PRIOR TO ROLLOVER DATE Co							
Equipment Checked	Check operational status and efficiency of all navigational equipment							
Staff Trained	All bridge watchkeepers to be trained to be familiar with safe navigation and watchkeeping practices without the aid of radar	Weekly training sessions from May 1999						
Alternate Method of Working Practised	Detail practice / training sessions	Drill carried out 14.06.99						
Instructions / Procedures Reviewed	Check all procediures							

Operation Affected	DIESEL GENERATORS – POWER MANAGEMENT SYSTEM FAILURE				
	Details				
Impact at Rollover Date	High impact – in coastal navigation and manoeuvring Low impact – in deep sea and good weather				
Alternative Method of Working 1	Manual control of Load Sharing Sets on board Additional manning in Engine Room				
Alternative Method of Working 2 (if appropriate)					
Containment Measures if Alternative Methods Fail	Load shedding of non-critical consumption				
	Alternative Method of Working 1	Completed			
Actions	Call Chief Engineer Advise the Bridge				
	Alternative Method of Working 2	Completed			
Actions					

RESOURCE REQUIF	REMENTS FOR ALTERNATIVE METHODS	Available/Location
Procedure(s) to be followed	Emergency procedure for loss of power	
Equipment Required		
Skills Required	Drills involving power management system failure	
Manpower Required	Watches in Engine Room	
Information Required	Manufacturers appraisal of equipment and potential for failure	

PREPARATION PRIC	DR TO ROLLOVER DATE	Completed
Equipment Checked	Check operational status and efficiency of all navigational equipment	
Staff Trained	Equipment checked by Manufacturer or approved contractor. This may not be on a particular vessel but a general check by the manufacturer.	
Alternate Method of Working Practised	Drills	
Instructions / Procedures Reviewed	Check all procediures	

Operation Affected	BRIDGE CONTROLS – MAIN ENGINE & ASS. POWER TE SHAFT ALTERNATORS, ETC	RAIN, E.G.,
	Details	
Impact at Rollover Date	High – in coastal navigation / manoeuvring Low – in deep sea in good weather	
Alternative Method of Working 1	Revert to Engine Room emergency controls	
Alternative Method of Working 2 (if appropriate)		
Containment Measures if Alternative Methods Fail	Stop / Anchor	
	Alternative Method of Working 1	Completed
Actions	Call master Inform Chief Engineer / Duty Engineer Engineers to use manual controls in E.R.	
	Alternative Method of Working 2	Completed
Actions		

RESOURCE REQUIF	REMENTS FOR ALTERNATIVE METHODS	Available/Location
Procedure(s) to be followed	Usual emergency procedure for loss of Bridge Control	
Equipment Required	Nil	
Skills Required	Ensure sufficient personnel on board to keep watches	
Manpower Required	Watches in Engine Room	
Information Required		

PREPARATION PRIC	PREPARATION PRIOR TO ROLLOVER DATE						
Equipment Checked	Manufacturer's guidance navigational equipment						
Staff Trained							
Alternate Method of Working Practised	Practised Practice manoeuvring for Emergency Controls						
Instructions / Procedures Reviewed							

Operation Affected	STEERING GEAR FAILURE	
	Details	
Impact at Rollover Date	Highly critical at all times except whilst moored in port	
Alternative Method of Working 1	Switch to manual (emergency) steering gear	
Alternative Method of Working 2 (if appropriate)	None	
Containment Measures if Alternative Methods Fail	Stop engines and anchor if practical	
	Alternative Method of Working 1	Completed
Actions	Refer to Ship's contingency plan for steering gear failure	
	Alternative Method of Working 2	Completed
Actions		

RESOURCE REQUIF	REMENTS FOR ALTERNATIVE METHODS	Available/Location
Procedure(s) to be followed	Following Ship's steering gear failure contingency plans	
Equipment Required	Manual steering gear Consider possibility of communication breakdown between bridge and steering flat caused by Year 2000 malfunction	
Skills Required	Helmsman	
Manpower Required	Sufficient helmsmen for possible prolonged period	
Information Required	Information Required Instruction for operating emergency steering gear	

PREPARATION PRIC	PREPARATION PRIOR TO ROLLOVER DATE Comp						
Equipment Checked	Emergency steering gear checked and fully maintained	26th April 1999					
Staff Trained	Training programme for helmsmen						
Alternate Method of Working Practised	Drills performed	1st May 1999					
Instructions / Procedures Reviewed	Procedure checked and verified	15th May 1999					

Appendix F1: Resource Table (Blank)

Supporting Information					
Manpower					
Skills					
Equipment					
Procedures					
Impact					

Appendix F2 Resource Table Example

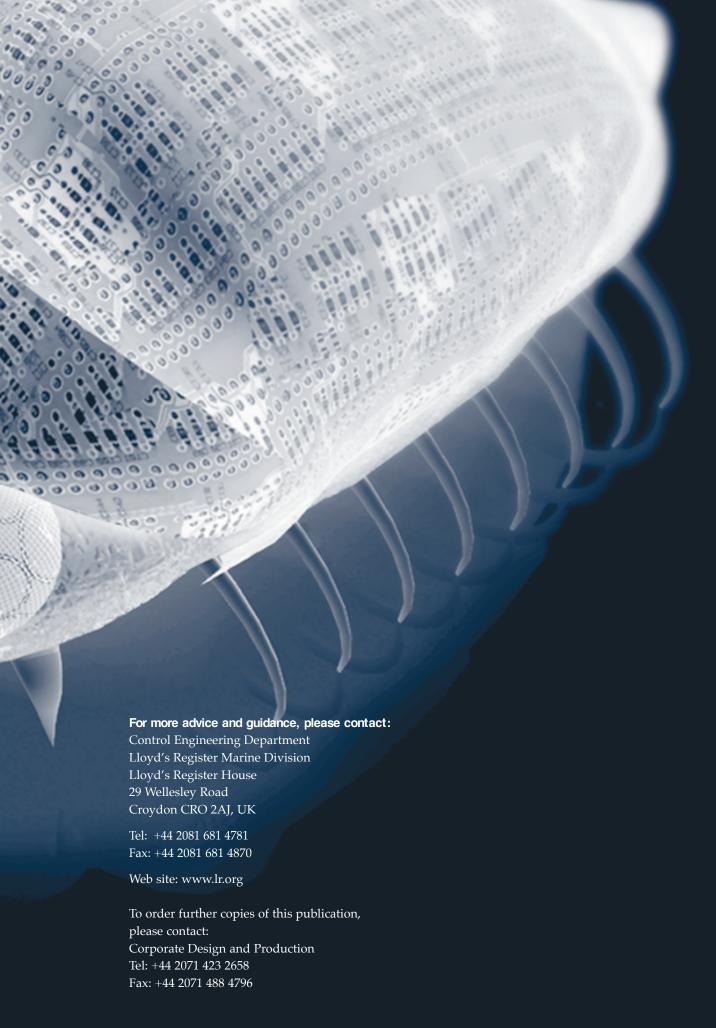
Impact	Procedures	Equipment	Skills	Manpower	Supporting Information
Steering Gear Failure - Unable to steer and position ship	Switch to manual (emergency) steering gear	Manual (emergency) steering gear. Communication system to emergency steering compartment.	Helmsman skills	Extra helmsmen	Manual (emergency) steering gear instruction manual
Radar Failure	Standard navigational bridge procedures	No additional navigational equipment required - ensure sextant, magnetic compass, azimuths for bridge wing repeaters operable	Knowledge, training and practice in collision avoidance situations and navigating in coastal waters without the aid of radar	Extra lookout(s)	Ensure standard nautical charts and publications are all up to date and crew practised in alternative position taking
Fire detection fails	Instigate fire watches		Personnel on fire watch to be fully instructed in duties if they find a fire	Possible watches doubled up	
Loss of Power	Usual Emergency Procedure for Power Loss	Emergency Generator	Practice Drills	Double watches at critical periods	Check with Manufacturers

Appendix G: Example Timetable for Ships up to and beyond the Date Change

24	24 hours before affected dates		
1	Emergency Steering drill, involving as many personnel as possible		
2	Check all internal communication systems		
3	Ensure spare batteries available or charged as applicable		
4	Check of windlasses and mooring arrangements		
5	Draw up watch arrangements to ensure extra personnel available to cope with any extra workload		
Within final 24 hours			
1	At 1100 hrs commence operation of all machinery in the manual mode, wherever possible and without compromising safety features		
2	Test all internal communications, especially sound powered devices		
3	Test manual stop/start of main engine		
4	Back up all systems data where possible onto secure tapes or disks		
5	Print out all key data from electronic systems		
6	At 2330 hrs contact Head Office and provide latest position and weather details		
Immediately after 'Rollover'			
1	At 0030 hrs contact Head Office to report on the situation – provide details of position and weather		
2	At 1300 hrs commence controlled switch back to automatic operation for all machinery. Verify all control equipment and navigational equipment against manual systems before relying on automated systems		
After 'Rollover' and Prior to Use			
1	Prior to recommencing deck and engine cargo operations, perform controlled tests of all systems relating to handling of cargo		

This is a sample list and far from exhaustive. It should be expanded in each of the above four areas to suit the type of vessel and circumstances of the vessel at the time.

Note: This document will probably be different for each vessel. The company should review this document after each Year 2000 Date Change so that any information learnt can be added.



Millennium bug illustration by Ian McLaughlin, Lloyd's Register

