The Year 2000: Is Your Construction Company Ready?

By Mike Prokop

Traditionally, New Year’s Eve is an occasion to celebrate, maybe even to forget about the work-a-day world for a few hours. But New Year’s Eve 1999 will be very different. Many people will be waiting anxiously to see how their computers and systems’ software welcome the new century.

Unless this is your first year 2000 article, you have already seen the litany of dire predictions about airplanes and elevators plummeting to earth, shutdowns of everything from traffic lights to heart-lung machines and even worldwide financial collapse.

Whether or not you believe those doomsday scenarios, it is undeniable that some businesses could be seriously affected as their systems, or the systems of their key business partners, either shut down or become riddled with errors. Businesses may sustain losses. Some may even go out of business due to year 2000 problems.

Will the Year 2000 Issue have an impact on your construction company? Yes. Are there steps you can take to prepare your construction company? Yes. Is there plenty of time? No. The clock is ticking, and one thing is certain: This deadline, unlike most construction project deadlines, will not be granted a time extension.

What Is the “Year 2000 Issue?”

The Year 2000 Issue, also known as “Y2K,” refers to the fact that many existing computers and systems can’t recognize the year 2000 because they use only the last two digits of the year to record dates. These computer systems assume that the first two digits are always 1 and 9, so “1998” appears simply as “98.”

This works fine until the computer gets to “00.” It will read that either as 1900 or not at all. In either case, there’s a problem. A computer system that can correctly recognize and use dates that occur after 1999 is said to be “Y2K compliant.”

What Kinds of Y2K Problems Might Occur?

Potential Y2K problems generally fall into two broad categories. First, some computers will fail at midnight on Dec. 31, 1999. Consequently, the computers won’t know what day it is, resulting in a rollover problem.

The second type of failure is incorrect future date calculations, which could be happening now. If a computer system has been programmed to use future dates in its calculations, and if any part of that computer system cannot recognize years beyond 1999, errors can occur. Those errors can then spread throughout the computer system, corrupting everything they touch.

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One of the first widely publicized examples of a Y2K problem was caused by a future date type of failure. A produce market was stunned to discover that its newly acquired computerized cash register system collapsed whenever a customer tried to pay with a credit card that had a post-1999 expiration date. It should be noted that the computer system did not simply reject the card, but it totally shut down, making it impossible for the store to remain in operation and serve its other customers.

**Do You Need to Prepare for the Y2K?**

Virtually every person, and certainly anyone who runs a construction company or business, needs to prepare for Y2K. If you do nothing, it is almost guaranteed that you will have some kind of Y2K-related problem. There is no “quick fix” or “magic bullet” coming any time soon—this is not just a computer issue. Since computers are essential to most construction businesses, this is a business issue that needs to be addressed by all contractors who have a potential Y2K exposure.

Construction companies have many of the same concerns as other businesses, but also some that are unique. For example, with the proliferation of “smart buildings” built over the last 10 years, including the life-safety systems, remote/local instrumentation systems and controls, sprinkler alarm systems,
HVAC systems, security systems, etc., there may be a potential Y2K-related exposure inherent within these systems, primarily from embedded systems.

**The Embedded Systems Problem**

Computer devices used to control, monitor or assist the operation of equipment, machinery or entire plants are another area of concern. These are the so-called “embedded systems.” Often the embedded system is a single, tiny chip buried deep in the machine that performs only one function—it signals the need for periodic maintenance, for example. Companies that rely on machines that contain embedded systems are at risk of having problems with such machines, as are engineers, manufacturers and contractors who make or service equipment that contains these embedded systems.

The first stop in preparing your company’s action plan to review embedded systems is to conduct an inventory. Date-sensitive embedded processors are built into everything from elevators to fax machines. Many devices such as switch gears, controllers, telephone exchanges, elevators, data acquisition systems, monitoring systems, diagnostic systems and real-time control systems contain embedded chips that perform a timing function. Other examples include surveying and locational equipment, ticketing systems, heating and ventilating systems, security systems, electronic door locks, video equipment, credit card verification systems, cash registers, metering and testing equipment and a variety of medical devices.

Finally, embedded systems in your process controls and similar systems may interface with your information-technology infrastructure to use sales figures to control plant output, for example. A front office IT system that is completely Y2K compliant might still fail if it receives erroneous data from a non-compliant data collection device in the shop.

Why are embedded systems a problem? Embedded systems are extremely difficult to check. You may not even know the chip is there. Many of the Y2K disaster scenarios you have heard involving airplanes, elevators and other common machines are based on concerns about embedded systems.

Which embedded systems will have Y2K problems? Any system that uses time intervals is suspect. The failure of an embedded system may not be a big concern if the device that malfunctions is a fax machine or a videocassette recorder, but it could be a big concern in a process control system that runs a multimillion dollar factory. A machine that operates continuously could begin to malfunction repeatedly. A machine that is turned on each day may simply refuse to start.

Your first resource for information about embedded systems is the manufacturer of the equipment. If you are an engineer, you need to review the manufacturer’s product specifications to ensure that the chips that are an integral part of the equipment are Y2K compliant before you specify that equipment to be installed by a contractor.

**Other Possible Y2K Problems**

In addition to embedded systems, you need to consider whether the particular issues raised by mainframe versus personal computers and by electronic
interfaces might affect your construction company.

**Mainframes.** Although the distinctions have blurred in recent years, mainframes are the big, centralized machines that form the computing infrastructure backbone of most large construction companies. However, more than a few medium-size construction companies have mainframes too, and many more rely on the services of data-processing vendors who use mainframes.

You may hear the term ‘legacy systems’ used in reference to mainframes because these machines are often the direct descendants of systems developed more than three decades ago. In those days, memory was extremely expensive, and any technique that conserved memory was adopted. Writing years as two digits is just one example of these conservation methods.

Today, some components of those old mainframe systems are still running. Fixing them for Y2K takes a combination of renovation and replacement. Because most of these systems use components supplied by vendors, fixing them usually requires close coordination between your IT people and those vendors. After the system is fixed, it has to be thoroughly tested. Overall, fixing mainframe software is a complicated and time-consuming process.

If you don’t have a mainframe, you may not have to worry about this area of the Y2K issue unless you have an outside processing service or key business partner that uses mainframes. Payroll is a typical example of outsourced processing services.

**Personal Computer Software.** For personal computers, a different set of problems occurs. The good news is that many of the popular over-the-counter PC applications sold by major companies like Microsoft are either Y2K compliant now or will be in their upcoming versions. In other words, the major software you use may be Y2K compliant already, or you may only need to upgrade your software to the most recent version. Compared to checking mainframe code line by line,
this can be a relatively easy and inexpensive solution. The key is to find out the Y2K status of your most crucial software now so you can be ready in time. Check the Y2K status of the software you have installed now and the status of the most likely replacement version.

Another issue with software has to do with your personal applications. Even if the program itself is Y2K compliant, you need to be concerned about applications that may have been designed in ways that aren’t entirely Y2K compliant. For example, if you have an application, let’s say an invoice form, that displays years in a two-digit format, it may continue to display years in a two-digit format even after the underlying program has been reprogrammed to accept four digits. You need to be aware of how your system handles dates in every application so that you can make informed decisions about whether or not to change it.

How new should your software be? Some experts say you shouldn’t trust anything made before 1997. If you are using off-the-shelf software that is so old it no longer is supported by its manufacturer (or the manufacturer itself no longer exists), there is a very good chance it has a Y2K problem. You need to either evaluate and test it thoroughly, or play it safe by replacing it. In any case, you need to test any software you have, regardless of its age, to make sure that it is Y2K compliant and will function properly in 2000 and beyond.

Another concern with PC software is proprietary programs. These are programs you wrote yourself, or that were written specifically for you. Those programs all need to be checked and, if they do not operate properly, replaced with new programs that you know are Y2K compliant.

Personal Computer Hardware. In addition to software, many personal computers have a hardware problem with their internal system clock and Basic Input Output System, known by the acronym “BIOS.” Every PC has one. Some internal clocks can’t recognize the year 2000 because of their BIOS chip.
This is critical because PC programs that use dates usually look to the system clock for the current date. You could have a software package that is 100 percent Y2K compliant and still have problems if the computer itself is incapable of crossing the divide because of its BIOS chip.

If your computer is more than a few years old, there is a good chance it has a BIOS problem, but even some newer computers have this flaw. Your best course of action is to check with the manufacturer, especially before you buy any new computers.

**Interfaces.** Another major aspect of the Y2K issue is interfaces. It is likely that your computers communicate regularly with other computers. Perhaps your computers are connected to servers to form a Local Area Network within your company. You may also interface with outside computers and systems you don’t control. For example, your computers may exchange files with computers controlled by your customers, suppliers, banks or outside processing services. You may have links with computers at a parent or affiliated company, employee benefits provider or branch offices, plants or distribution centers.

Even if your applications and systems are all Y2K compliant, your data could be corrupted by noncompliant data coming from one of these outside sources. The amount of coordination required to achieve Y2K compliance within these electronic interface networks is a challenge. All participants need to become Y2K compliant. Then they need to test and coordinate their fixes with each other to make sure they are still compatible.
Even if you don’t interface with business partners electronically, their Y2K readiness could still affect your business. What if a key business partner suddenly crashes on Jan. 1, 2000, and can’t conduct business? Will your business be affected?

Coordinating these issues is delicate because there are still many unknowns, and no one wants to create unnecessary liabilities.

Documentation is the key. Be sure to keep good records of everything you do to prepare for the year 2000.

**A Y2K Checklist**

So how should you begin? Here is a simple outline of the steps to follow:

- Get started now. Don’t wait.
- Raise the awareness of everyone in your company and assign one or several teams to tackle the various tasks.
- Inventory all of your systems,
equipment and facilities that may be affected, and assess their compliance status.

- Assess the compliance status of your suppliers, customers and business partners, especially when there are interfaces involved.
- Identify your core business functions and procedures.
- Develop a compliance strategy and create a detailed plan.
- Create a contingency plan.
- Identify and prioritize resources that will help you get ready.
- Contact all of your suppliers, customers and business partners, and document their responses.
- Thoroughly test your systems.

In all cases, whether your concern is embedded systems, mainframes, PCs, interfaces or all of the above, the single biggest part of your year 2000 preparation process likely will be testing.

Will Y2K failures and the harm they may cause be covered by insurance? Coverage, if any, will depend on the terms of the policy and the specific facts of the claim. In addition, no coverage exists for Y2K-related exposures on many types of policies as currently written. The best protection against loss is to assess the problem as it relates to your own computing devices and correct it.

If you have not yet begun to prepare for the year 2000, start now. There are many qualified resources available to help you, but they will become increasingly scarce as the deadline approaches. Remember, literally every computer-dependent business on earth has the same exact deadline for this project, so if you wait until the last minute to hire programmers or consultants, you may be unable to find competent or reasonably priced resources.

The Y2K issue is serious. It needs to be resolved, and it can be. If we all pay attention to it now and do what needs to be done, we can fix it and get back to business.

About the Author
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