

6 Immediate Actions for Aging Control Systems

If you are a plant, operations, facility managers, or C-level executives of a process manufacturing facility, then chances are you do not get deeply involved in the status of your control system and infrastructure. Your interaction with the control system may be periodic updates that you receive from an engineering manager, which is perfectly reasonable. However, it is typically in their best interest for you to be of the opinion that they are doing a great job keeping your plant online and producing, so the updates that you receive may be rosier than they should be. You may not be getting the entire story, especially if you have an aging control system.

Managers may not be hearing that their team is struggling with equipment failures, worn out cables, obsolete operating systems on their consoles, and especially equipment sourcing. We've encountered equipment sourcing situations that definitely should have raised red flags, such as using remanufactured parts websites and even third party seller sites.

If the label on your DCS or PLC no longer matches the current owner or manufacturer of that system, it's important to take note. Here are a few pertinent examples:

- Bailey Infin 90 and Net 90 – now owned by ABB
- Reliance Automax – Now Rockwell
- Moore APACS – Siemens since 2000 with an end-of-life marked for 2020
- Westinghouse WDPF, Provox, RS3 – Emerson since the early 90's
- Rockwell PLC5's lost manufacturer support in 2017
- Foxboro IA – Now part of Schneider since purchasing Invensys

Due to the resourcefulness of your staff, you probably haven't had any serious downtime yet, but the clock is ticking. Budgets are always a constraint and capital expenditures may be tight, especially for full DCS replacements which are often multi-million dollar investments. But what is the cost if your production facility went down and could not recover for a week or more?

If this question unsettles you, action is strongly recommended. There are a concerning amount of facilities that are unprepared for system failure or

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obsolescence, which can have catastrophic consequences. If you are an operations, facility, or engineering manager in this situation, it is strongly encouraged to begin preparing for migration of your control system from a legacy system to current and supported architectures.

Good information is critical to success, so you will want to immediately discuss this with your controls team and potentially a trusted systems integrator. In the meantime, there are a few things your staff can do to help to prepare until you have a plan in place and budgets approved.

6 Immediate Action Items for Aging DCS/PLC

1. Backup
2. Get copies of all software license files
3. Update your system drawings
4. Check your spares
5. Make a wish list
6. Develop a Functional Specification for a migration plan

1. Backup

You need to find a way to obtain backups. The best method is to take an image of the machines, although this can be difficult if you are dealing with an old operating system. There are several software packages available to perform this task, but the one we have found that works best for us is Acronis. It allows you to do partial restores and restores to non-similar machines. Whatever method you choose, get it done and do it soon!

2. Get Copies Of All Software License Files

Make copies of all license files. We have seen on more than one occasion where the SCADA or other types of software is not technically licensed to the end user. It was still in the integrator or OEM's name – or even worse in another customer's name! Once you have copies, check with the vendor to ensure the licenses are valid. If they are not, you have another set of problems to deal with and should make contact with whoever sold it to you.

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3. Update Your System Drawings

This includes panel drawings, P&IDs, network layout and/or One-Line Diagrams (also known as Single-Line Diagrams), etc. This is the most time-consuming task, but it will pay extreme dividends in the long run. If possible, get electronic copies of your panel drawings and have someone (an engineer, a maintenance tech, or intern) go through all of the I/O to ensure the drawings are labeled correctly and all of the wires are marked with wire numbers. If there are decommissioned I/O then disconnect them and label them as such.

Please take the proper precautions in accordance with appropriate regulations. Also, watch for old network cables as they are prone to come loose. This can cause the process to stop or shutdown. As much trouble as it may seem, this exercise will help facilitate the crossover drawings during a future upgrade. This will also be greatly appreciated by your maintenance team while they troubleshoot your aging system prior to an upgrade. If you do not have drawings, take detailed pictures and create termination drawings. As long as they are accurate they will suffice.

4. Check Your Spares

Immediately review your available spares and ensure that you have spare parts for all critical components. The problem you will have is that since your system is old, or potentially obsolete, the costs of the parts are greatly elevated. So take into consideration how long you will be running on the old system and when you start your migration. Often, a phased-in approach will provide you spare parts as each phase is replaced. By migrating in phases, the blows to the budget are lessened.

5. Make a Wish List

Begin developing a list of priority issues that you would change, if you could. Be sure to include operations and maintenance as well. Include specific problems if you know them, such as specific loops running in manual, field shorts or recurring instrument problems, lack of backup power, safety concerns, or process improvements.

An example would be to add wireless systems in the plant so operators could stand at a specific piece of equipment and control it using a handheld operator screen or

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even a tablet. Be creative. Technology is changing and there are a lot of options available to increase productivity and make system maintenance easier. Don't forget about the control room furniture. If you upgrade to a modern control system, why not spend a little money on the control room to make the operators' jobs easier?

6. Develop a Functional Specification For A Migration Plan

We see many request for proposals (RFPs) and specs for upgrades that are less than sufficient to quote a job accurately. It doesn't mean that a qualified integrator cannot quote the project, but the more unknowns and assumptions that a vendor has to take on, the more contingency they have to put in the quote. It then becomes a matter of who guesses best, is willing to take on the most risk, or play the change order game. Regardless of the method, your corporate budget is also at greater risk with a higher number of contingencies.

A well done Functional Specification will allow you to plan the best method with the requirements that are important to your company and specific to your system. The key is that the results are clearly defined and contingency is minimized. As long as the functional specification is followed, the end results will be how you desired it and not how an integrator interpreted a vague request for quote or proposal.