Article

TO REPAIR OR REPLACE THE DEVICE – THAT'S THE QUESTION

Decisions in the final phase of the life cycle of a device can influence operations, quality and performance. This article identifies some of the pros and cons that should be considered when making the major device repair or replace decision and explores solutions that will significantly guide the decision making process. (article 3 of 3 in the lifecycle series)

OVERVIEW

Managing the forever evolving plant lifecycle infrastructure is a commitment and challenging job especially with business drivers such as: reduce downtime, improve plant reliability, lower operation costs and regulatory compliance in areas of safety and environmental issues. The balancing act is not an easy task, especially when it comes to a measurement and control device in the last phase of its lifecycle (article 3 of 3 in the lifecycle series) where possibly uneasy decisions must be made – do we invest in a major repair, or do we replace?

Both old and few facilities have their own rules or guidelines regarding the major repair or replacement of a device which makes it impossible to suggest hard-and-fast rules on the subject. This article identifies some of the pros and cons that should be considered when making the major repair or replace decision and discusses the role that a FDT enabled device and device management tool can play in helping you through the decision making process. Knowing that there are costs and risks associated with both options, it's important to be educated when pondering the "end of the road."

TO REPAIR OR NOT TO REPAIR

If the specific device falls into the category of being a "bad actor", then the decision to repair or replace becomes straight forward. But if a device shows early signs of *potentially* having a serious problem, like possibly causing a shutdown, how do you justify the cost and resources to repair or to replace?

There are many different strategies regarding this topic including "repair at any cost" or "run until it dies" and then replace. Also, common today is a deferred maintenance strategy which is a practice of deferring maintenance to the next month or next quarter or when more budget money may become available. Deferring needed repairs is risky and comes with its own set of issues as it might eventually lead to a higher cost, causing other assets to fail or in some cases might have safety or environmental implications.

FACTORS FOR CONSIDERATION

As mentioned, the decision to invest in a major repair of a measurement device or to replace it can be based on a number of different factors:

- Maintenance history – count work orders to see if you have a problem child, bad actor, or if the device is just starting to show symptoms of a problem.
- Age of the device – has it outlived its usefulness or is it in need of some TLC.
- Availability and cost of spare parts – if parts are no longer available, no repairs are possible.
- Technology or capability of the device – newer technology may provide better performance and possibly more features or options.
- Labor cost - for removal and replacement compared to repairing, rebuilding and calibrating.
- Expertise required for device replacement or repair – repair in-house or bring in a specialist.
- Risk management based on the criticalness of the device – is there a significant risk that the device could shut down the plant or cause other problems?

- Equipment downtime – does the repair require a shutdown?
- Software or firmware updates – are updates available which may solve the problem. If so, what is the cost?
- Device ability to meet the required specification – due to age, wear-and-tear or just not being able to calibrate to required performance standards.

Many companies use a 50-60 percent rule for repair or replacement decisions. If a repair cost is more than 50-60 percent of the cost of a new device, it is replaced. And, if the device performance (accuracy, drift, repeatability, etc.) is not acceptable, the device may need to be replaced. Each facility most likely has a policy that dictates this ratio based on a mythology or practical experience.

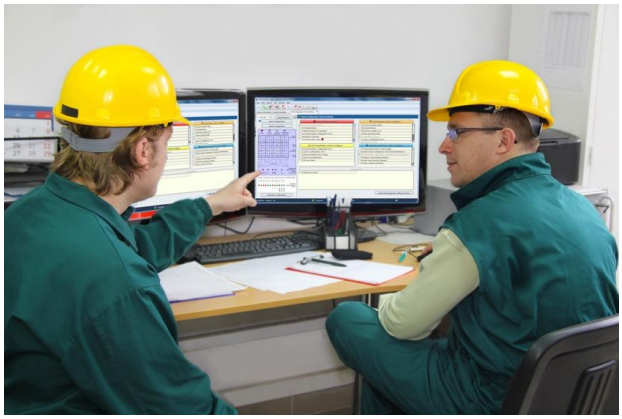
In addition to the above, there are other issues or costs that are more related to the "total cost of ownership" that might have an influence on the decision. Focusing exclusively on the direct repair or replacement cost may lead to less-than-desired long-term results. Consider these other more indirect costs:

- Will a new device provide a change in product quality?
- Could a replacement device improve the efficiency of the process or production?
- Are there safety or environmental issues to consider?
- Can the failing device cause a loss of production – failing to meet customer expectations?
- Will a new device provide an opportunity to transition to a smart device to contribute to a more preventative maintenance strategy?
- Does the replacement better support corporate guidelines, policy or standards – i.e. drive toward the Industrial Internet of Things, or best-in-class production?
- Consider the life expectancy of the unit operation or plant.
- Will a replacement device improve measurement stability, accuracy and reliability?

DEVICE REPAIR & PERFORMANCE HISTORY

In an older brownfield plant (20+ years old), many devices may be reaching the end of their lifecycle. Repair may be a forced decision due to limited budgets for replacement or lack of resources to engineer and execute a replacement. If the device is analog or non-smart, a review of the maintenance history and repair logs for the device may be a good indicator of the condition and repair ability of the device. There may also be some historical repair experience among technicians that can shed some light on what it takes to repair the device.

If the device is smart (and the majority of devices deployed in the past 10 years are), meaning it can communicate and provide diagnostic information, it is best to start with asking or communicating with the device for its available status, diagnostic or performance information – indicating the health of the device based on digital data. This is where FDT Technology can have a significant impact on the repair or replace decision.



Using a Device Type Manager (DTM – the driver for a FDT enabled device) with one of 40+ available device configuration or device management software applications that are FDT Technology enabled, you'll have direct access to device diagnostics and troubleshooting functions that have a huge beneficial impact when analyzing the device over its lifecycle. FDT enabled configuration applications and FDT integrated host systems can "check-in" on device(s) looking out for maintenance needs throughout the life of the device(s) for both existing devices currently in the field and new devices as devices are replaced. User's report 63% of maintenance checks result in "no action taken", so being able to reduce the number of checks will be a big benefit to the operation. The use of a FDT enabled device management application makes the decision to check, repair or replace a device much quicker and easier, saving time, money, and basing the final decision on actual data.

REPLACING A DEVICE TAKES WORK

Decommissioning and replacing a device takes work! You might find that the "decision" to replace is much easier than the actual work of procuring, checking, installing and commissioning the new device. And, you have the added cost and work of decommissioning the old device. Depending on the process and the specific application, the issues and process of decommissioning a device might include:

- Review, planning, engineering, purchasing, calibration / configuration, and documentation of the new device.
- Device removal and replacement.
- Environmental handling of a device that has been in contact with certain fluids.
- Cleaning and disposal of a device that was in contact with hazardous material.
- Safety of employees and the environment if the device needs to be decontaminated.

- Installation work required for the new device - new wires, form and fit of the replacement device, new mounting or piping requirements, etc.
- Skill and experience with the removal and disposal of certain devices.

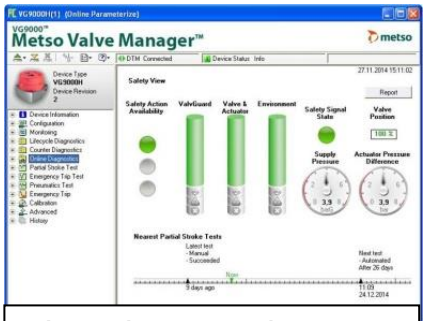
THE CASE FOR REPLACEMENT

On the bright side, if you decide to replace the device, you have an opportunity to significantly improve the application and performance compared to the old device. For example, you can now review the actual specifications and requirements of the application and select the most appropriate device for the job. In many cases, devices were specified years ago based on engineering design criteria and not on actual application requirements. Proper sizing and selection may indeed produce improved measurement, better stability, improved accuracy, better repeatability and more flexibility because of enhanced features and functions.

With the opportunity to replace a non-smart device with a smart device, you provide the opportunity to lower the total cost of ownership for the device. Selecting a smart device that has a DTM and using it as part of a device configuration or asset management application that accepts DTMs enables faster configuration and access to the valuable built-in diagnostic information.

CONCLUSION

So, the next time you are faced with the decision to do a major device repair or replacement, think about the benefits of a replacement and the opportunity of specifying a FDT Technology enabled solution. The benefit of device optimization through an FDT enabled device management tool provides many advantages for your immediate need and future use. Consider the ability to access information from the smart device from a remote or safe location – reducing or eliminating trips into the field! In addition to gaining access to device diagnostics, you can begin to migrate to a predictive maintenance strategy, improve plant reliability and lower maintenance costs that will positivity impact the bottom-line. If the decision is made to replace, select a device that will provide life cycle benefits today and well into the future.



This DTM by Metso provides an easy to read graphical interface to help you migrate to a predictive maintenance

This article is the last in a three part series addressing decision making factors for device repair or replacement in the device life cycle. Part 1 identified the benefits FDT Technology delivers in the first few phases of the life cycle including planning, engineering, installation, commissioning and startup. Part 2 took an in-depth look at the operational, service and routine maintenance phase. Be sure to review those articles to get the complete picture of how FDT benefits the entire plant lifecycle.

How do you get started improving management and operation of your forever evolving plant lifecycle infrastructure? Ask your automation providers for their FDT Technology based solutions. For more information, visit www.fdtgroup.org.