



TECHNICAL WHITE PAPER LIFE CYCLE POLICY FOR THE CHEMICAL, PETROCHEMICAL AND PHARMACEUTICAL INDUSTRIES

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The life of certain pieces of equipment may be considerably shorter and they may be replaced several times over during the plant life cycle.

This paper describes the policy Pepperl+Fuchs have adopted to satisfy the need for extended plant life cycles.

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Life Cycle Management and Service

The chemical, petrochemical, and pharmaceutical industries as well as the oil and gas sector expect their plants once commissioned to be operating for at least 10 to 15 years. In today's competitive market there is often the need to extend this life time and to reuse existing technology.



Although the life expectancy of instrumentation, control and electrical systems usually covers many of these requirements, the life of certain pieces of equipment such as monitors or PCs may be considerably shorter and they may be replaced several times over during the plant life cycle.

Some of these issues also have an influence on intrinsically safe interfacing equipment. While conventional instrumentation employs standard signals well established over the past 30 odd years it often is fitted with configuration software required to run within the framework of the ever changing WINDOWS® environment. This is even more important for intelligent process interfacing equipment such as Profibus or Modbus or Foundation Fieldbus related devices and systems.

Furthermore it is sometimes desirable to integrate existing equipment in plant-wide operation, information and asset management systems. This facilitates resource planning, and maintenance management offering additional features for real-time information and decision support. One option in this area is the more extensive use of HART® field devices whose outstanding properties have been dormant for years and are now given a new life using bus communications or HART multiplexers.

Market deregulation and globalization have had a considerable impact on business processes. Environmental changes and new health and safety standards also have an influence on running installations often requiring upgrades or improvements.

Thus the role of equipment suppliers has had to change requiring closer cooperation between them, the system suppliers and the owner/operators.

Plant life cycle extensions embracing the integration of existing installations for wider business processes now require significantly more ahead planning and engineering. Since end users had to focus more on their core activities and having had to streamline their workforce they will rely more on external support and services offered by their suppliers.

Pepperl+Fuchs have realized this and have gone beyond the traditional supply and service procedures. We not only ensure that our products have a long life but we also offer assistance in all stages of a plant life cycle. From consulting, through engineering, operation and maintenance services our customers can expect our full support. This extends to our close cooperation with system suppliers and engineering companies ensuring that our products adhere to the latest standards and regulations. Pepperl+Fuchs are an active

member of international committees such as PNO, FDT Group, Fieldbus Foundation, and HART Communication Foundation, as well as chairing the PACTware consortium.



Like our customers we are in favour of open systems which safeguard a plant through true interoperability of standardized equipment provided by different manufacturers. Stringent testing both in-house and by the relevant test institutions see to it that the hardware fulfils the specifications outlined in the data sheets and that software revisions are controlled and updates can be installed to be compatible with a running system. At the same time we allow our customers to stay with a proven software version even though upgrades may offer new and improved features.

Supporting your intrinsically safe interfaces

Pepperl+Fuchs are a leading supplier of intrinsically safe interfacing equipment for all industries. Millions of conventional I/O devices and hundreds of thousands of bus related products are in operation world-wide.

We pride ourselves in having a team of well educated engineers who are regularly trained to keep up with the advances in standards and technologies. Since 1945 Pepperl+Fuchs have always been at the forefront of providing you with modern, long lasting, reliable equipment.



Reliability and MTBF

High integrity and reliability are the key factors to a smoothly running process. Where production has to continue uninterrupted for many years it is of paramount importance to employ high quality equipment. Product reliability is a combination of quality, durability, and ruggedness. Devices must be able to be fully integrated in any system environment, easy to install and maintain as well as hot swappable should it be necessary to replace individual parts during operation.

Reliability is often expressed in terms of mean time between failures (MTBF) a factor which is based on probability calculations. Over the years criteria have been developed to assess electronic equipment making use of likely failure rates of components taken from the literature. The resulting figures are available at request and are an indication of the longevity of a device or system.

Another figure often mentioned in connection with the MTBF is the mean time to repair (MTTR). We at Pepperl+Fuchs have adopted the policy to have spares ready in our various outlets around the world. At the same time we strive to return goods sent to the factory for repair within the shortest possible time.

Easy access to spare parts and short times to repair ensure high plant availability

ISO9001 quality standards are but a small fragment of all the requirements needed to provide you with high grade equipment. Even then preventive measures are needed to be able to react to unexpected failures.

Therefore we have adopted the following policies based on decades of experience:

- stock-keeping of spare parts to prepare for possible maintenance
- stocks can be kept by the plant owner and will certainly be available from the factory at short notice
- with our world-wide network of factories and sales outlets, arrangements can be made for local stock keeping offering a fast and cost effective way for all eventualities
- we offer reliable and efficient repair processing with test reports at your request

All these measures are in place to ensure that plants can run smoothly and cost effectively.

Trouble shooting and support

Although spares will help you solve a given task in most cases you may sometimes require additional assistance. During normal working hours there is always someone at the other end of a phone line who will gladly help you find an answer to your questions. Beyond that arrangements can be made for special assistance outside hours.



In many cases our experienced service engineers will be able to talk you through a problem or even to guide your hand through the use of secure software interfaces such as PC Anywhere. This particular software enables us to follow your actions ONLINE from a remote location without you having to worry about us being able to interfere with the running of your plant. Remote access can only be opened by you and it enables us to be on site anywhere in the world within seconds. This cuts travelling time and travelling expenses and allows us to respond to your requests quickly and efficiently.

These services can also offer:

- ONLINE engineering support
- ONLINE diagnostic support
- ONLINE fault analysis

This reduces the risk of misunderstandings, reduces time to repair and certainly gives you the reassurance you need to run your processes with confidence. At the same time our service engineers have direct access to the entire in-house expertise and knowledge.

Furthermore you can also ask for a commissioning engineer to stand by you on site to get your plant up and running by prior arrangement with your purchase order.

All this will help you minimize down time offering cost savings and a smooth operation of your plant.

Preventive maintenance

Asset management systems are installed in many plants and all intelligent Pepperl+Fuchs Remote I/O support this feature. This is a particularly strong point of Remote I/O and other bus related equipment.

Monitoring process sensors and field devices on a continuous basis helps to prevent unscheduled down-times. Remote I/O is transparent to asset management software based on standard bus protocols even reaching out towards HART field devices. Fieldbus systems on the other hand can be equipped with advanced diagnostic hardware and software to continuously monitor the quality of the bus connection.

Thus any degradation in the performance of a field device or the properties of connections and links can be detected in time. Similar results can be achieved in conventional point to point installations using HART multiplexers.

On the hardware side it may be prudent to check a system on an annual basis to be able to detect possible degradation. Power supplies in particular should be refurbished after about ten years of service in case they contain electrolytic capacitors. Relays are also subject to wear and tear depending on the number of switching operations over time.

Training

Your well qualified personnel may need little training to work with equipment supplied by Pepperl+Fuchs. However, should you require additional training on intrinsic safety technology, safety related systems, or bus technology our experienced trainers are at your disposal. Training sessions can be conducted on site or at a venue near you or you may choose to attend one of our regular seminars as advertised on the internet.

Training and refresher courses keep your staff fit on the job and may even raise their level of motivation. It may also save time as compared with ploughing through manuals and learning on the job.

Extending the life of your plant

Economic and environmental pressures as well as health and safety aspects can raise the demand for plant modernization or modification. This requires Pepperl+Fuchs to ensure that our products operate reliably and remain available as functionally compatible spares or for expansions for many years.

Eurocards perhaps give the best example of longevity. First issued over 35 years ago Pepperl+Fuchs Eurocards and their compatible enhancements are still available today. We are one of the few remaining suppliers who have taken these intrinsically safe interfaces through generations of changing electronic components. Successive cards may not always have been identical but they were always functionally compatible with their predecessors mostly to the extent of being pin compatible.



Similar policies are in place for other product ranges such as DIN rail mounted devices. Modern day instrumentation relies more and more on cost effective bus technology. Remote I/O and fieldbus products are the key to efficient process interfaces between the sensors and actuators in the field and the process control

system or PLC. Remote I/O has been around since 1995 and now sees its second generation which is fully compatible with the first. Where new and enhanced features have been added these can be brought to life through upgrades or sometimes even simple updates.

Our experienced engineers will also be able to assist you to find new solutions or functionally compatible solutions where equipment has been phased out by other manufacturers or where the ever changing computer environment demands software upgrades.

New demands will be analysed by our project engineers in close cooperation with our customers to arrive at optimized, cost cutting solutions.

Modernization by upgrades or migration – life time policy

Pepperl+Fuchs not only develop and manufacture reliable products at the best possible price but also have a policy in place to make these available over many years. When a product first reaches the market it is expected to stay there for 10 to 15 years. During the course of its life time the device has to be maintained to keep up with changes in the component market. Therefore we pride ourselves in a strong and experienced team of highly qualified research and development engineers. They not only ensure that we can offer products performing under demanding operating conditions but also guarantee functional compatibility of successive generations.

Should a product have to be phased out after many years in the market because the product is no longer commercially viable we expect this downturn to be stretched over a period of several years. At the end of this period you will have the option of a last call or entering into an agreement to be supplied for a few more years. Should a product have to be phased out after many years in the market for reasons beyond our control we will help you work out alternative solutions. This also covers changes in the links with process control systems or PLCs.

Plant modernization offers a variety of benefits such as improved process control, better diagnostics, and more reliable hardware when an outdated system is replaced. During this transition you may want to reuse existing installations protecting your financial and engineering investment.

System changes to enhance the overall performance may also require Upgrades in our interfacing equipment. Here Pepperl+Fuchs strive to make these transitions as easy for you as possible. Our software engineers have developed tools to migrate existing projects smoothly to take them to a new level within the DCS environment. You can rely on Pepperl+Fuchs to be a responsible partner when it comes to meeting new challenges.

Service Contracts

Although our products do not require regular maintenance we provide support for our installed base for as long as the equipment stays in operation. We strive to assist our customers with all aspects of maintaining and optimizing their plant. Normal service usually only requires a simple part exchange using spares.

Where more complex situations arise our clients can rely on our well trained service engineers to solve a problem by phone or on site.

Since our customers have often entered into a service contract with the system vendor, they may want to extend this to our interfacing equipment. Pepperl+Fuchs are prepared to enter into subcontractual agreements offering calculable annual service costs.

Service contracts not only reduce the financial risks for our customers but also reduce the probability of down-times. Regular service inspections will be able to detect weaknesses before they become a problem. With this overall system availability can also be improved.

Service contracts can range from simple hotline-support to life cycle agreements. Our customers can determine the level of support they feel most comfortable with.

Most system vendors offer a service hotline to answer calls around the clock, every day of the year, ensuring a fast response when a fast response is needed. This will normally not be required for Pepperl+Fuchs interfacing equipment. However, during planned maintenance our Upgrade activities you may want additional standby assistance. This can be organized by prior arrangement.

Pepperl+Fuchs have qualified engineers familiar with our products around the globe. They have access to our product data base and can advise you with any question you may have. Our local presence allows us to respond quickly to our customers' needs and wishes. The technical excellence of the head-office on the other hand provides the backbone to cope with complex and challenging technical tasks.

PROCESS AUTOMATION – PROTECTING YOUR PROCESS



For over a half century, Pepperl+Fuchs has been continually providing new concepts for the world of process automation. Our company sets standards in quality and innovative technology. We develop, produce and distribute electronic interface modules, Human-Machine Interfaces and hazardous location protection equipment on a global scale, meeting the most demanding needs of industry. Resulting from our world-wide presence and our high flexibility in production and customer service, we are able to individually offer complete solutions – wherever and whenever you need us. We are the recognized experts in our technologies – Pepperl+Fuchs has earned a strong reputation by supplying the world's largest process industry companies with the broadest line of proven components for a diverse range of applications.

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