



## Work Processes for Maintenance Strategies

Traditionally, equipment in the field sends a signal to the control room. This signal is traditionally either a process control signal, or equipment reliability related signal. If it is the latter, the chances are that it will never pass the operator and be sent to the maintenance crew. The reason for this, the systems have become too complex and they are handling too many information, whilst there are fewer and fewer operators to handle the information overload.

What is the solution? Simple: take the maintenance related information away from process control networks, put them on the IT network and only transmit when action is required, preferably by triggering directly a work order for the maintenance crew.

To achieve this, Ideation AS has launched a product called CBM Predictor. It is the latest generation of devices that operates on the principles of IoT (Internet of Things). It is simple, easy to install, it requires no knowledge of the embedded algorithms, it communicates with the cloud via the Bluetooth and/or WIFI network, and it reports only actionable information when appropriate. It is designed to monitor Process Safety Valves (PSV) and notify customers of the popping action and potential leaks as a consequence of a failure to re-seat.

CBM Predictor can be incorporated in various maintenance scenarios, and we will explore a few of them. Scenario A in Fig 1 shows operational principles when a PSV hits troubles and either pops or/and begins to leak.

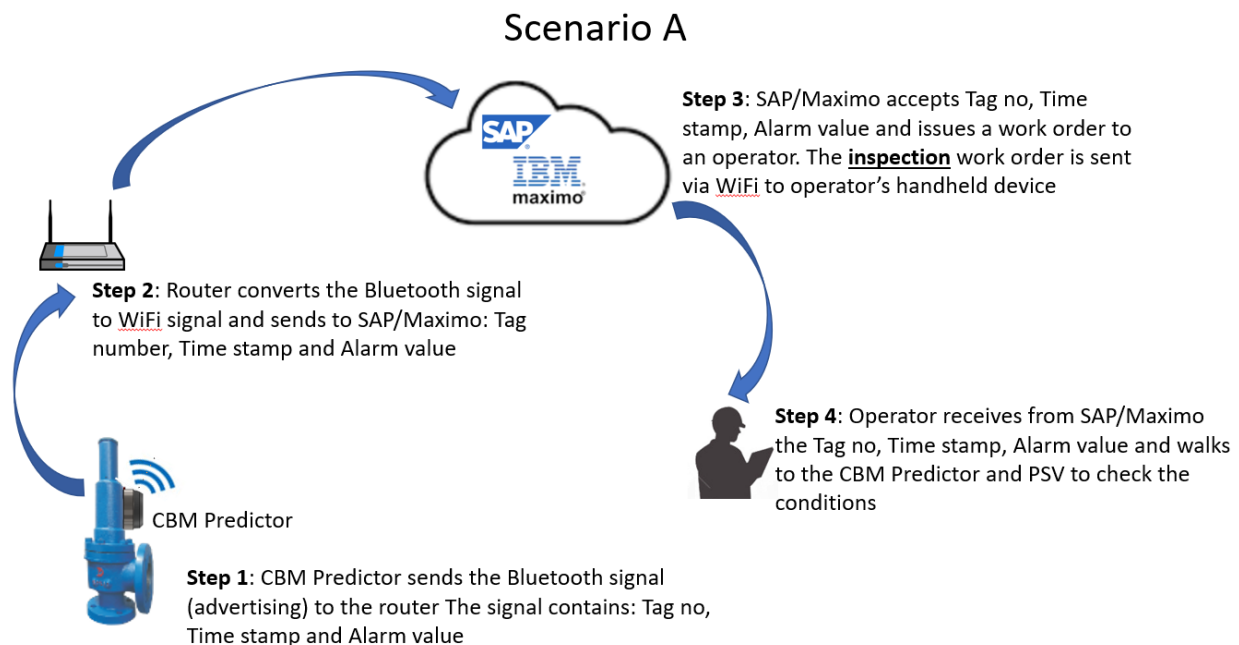


Fig 1. Work process scenario triggered by a PSV

As we can see, on the occurrence of an incident only limited information are transmitted (Tag number, Time Stamp and Alarm Value). The information is relayed via a wireless router directly to the cloud. The router can come in several combinations to mix and match the Bluetooth and WiFi signal, depending on customers' topography. The cloud hosts a business app that supports maintenance (A SAP system or Maximo, for example). This app will automatically trigger a work order instructing a maintenance crew to inspect the specific PSV.

An alternative scenario is assuming that the company is running the so-called operator-led maintenance strategy. In this scenario operators are instructed to take regular walk-downs through the plant and inspect various pieces of equipment. According to Scenario B in Fig. 2, the operator goes through a section of the plant that has been scheduled for inspection. His handheld interrogates all CBM Predictors in the section of the plant and collects the relevant information. The information is relayed to the cloud. If one of the PSVs needed attention, the maintenance app on the cloud will issue a work order to the maintenance crew with instructions to inspect a specific PSV.

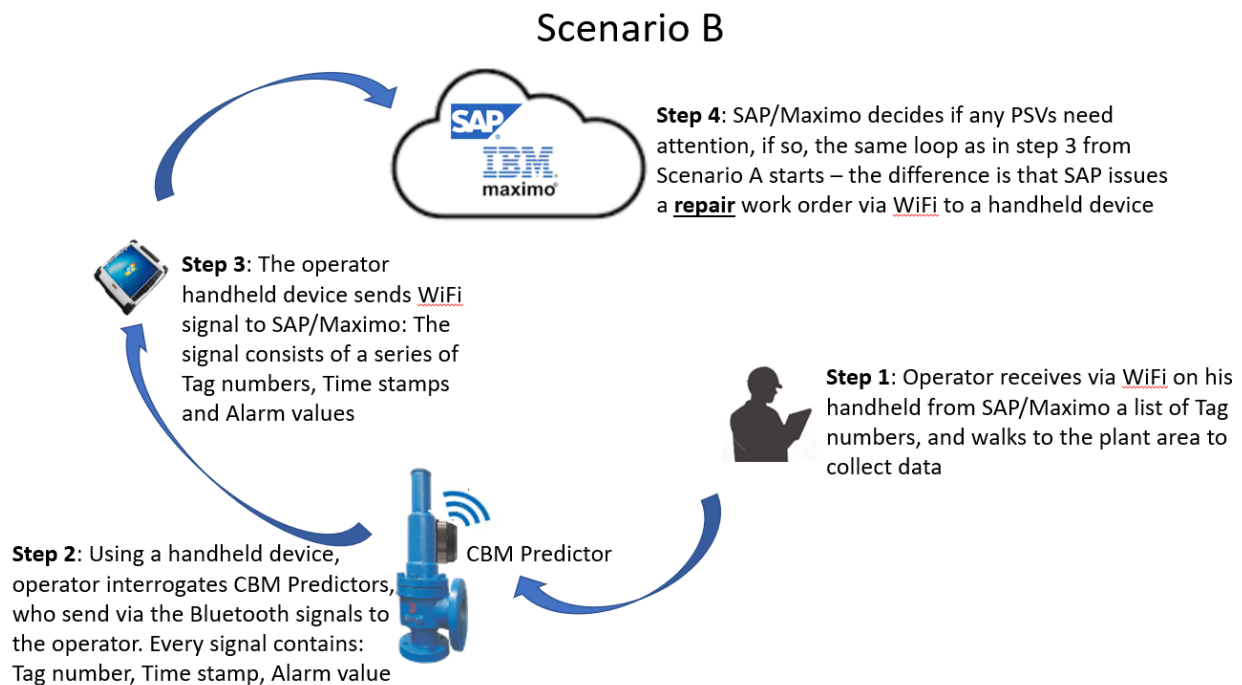


Fig 2. Work process scenario triggered by a scheduled operator walk-down

Needless to say, we can combine these two scenarios into one integral work process. Scenario C in Fig 3 depicts this. It starts with the PSV declaring a problem and involves two different work orders, one to inspect the PSV and the other one to repair it. In any case, any permutation of the initial steps is possible and depending on customer maintenance strategies, this technology will fit into their work processes.

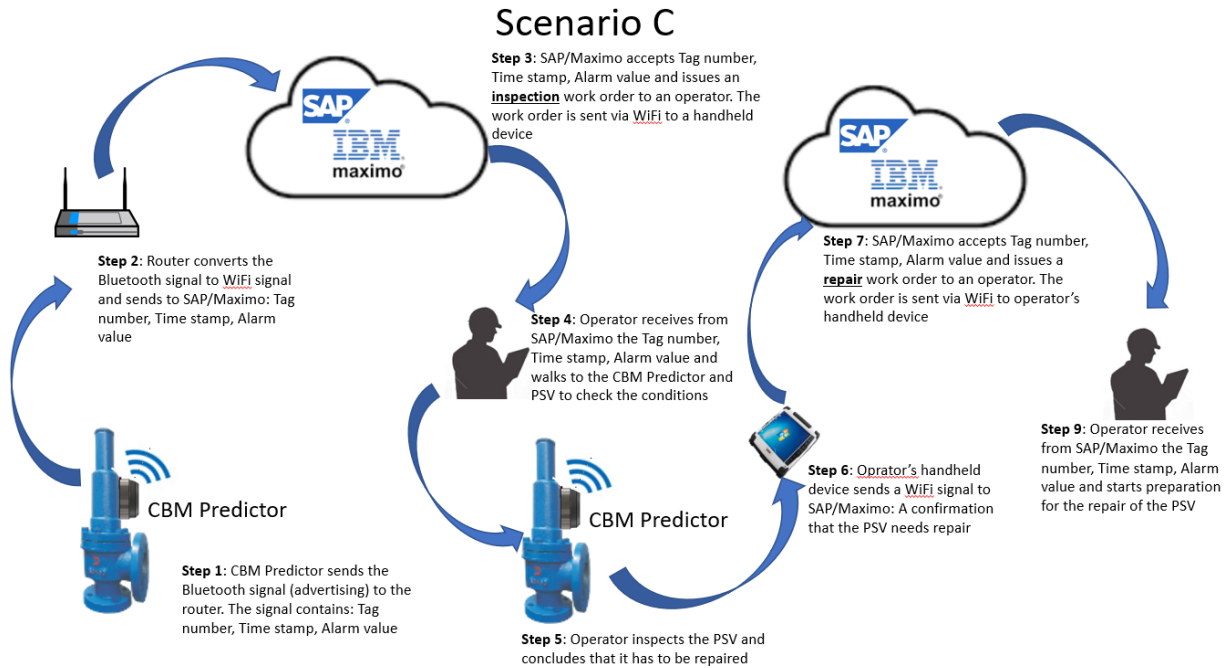


Fig 3. A comprehensive maintenance scenario involving multiple steps

The key point to emphasize is that maintenance strategies do not have to depend on signals pushed through control systems. They can be based on free IT infrastructure and directly integrated with maintenance systems that generate work orders. The process is streamlined, made simple, less expensive and provides only selective information to the people that need it in actionable form.

The device that is used to drive this new approach is CBM Predictor and has been designed with the above points in mind. It is simple, easy to install, it requires no knowledge of the embedded algorithms, it communicates with your cloud via the Bluetooth or WIFI network, and it reports only actionable information when appropriate. It is designed to monitor Process Safety Valves (PSV) and notify customers of the popping action and potential leaks as a consequence of a failure to re-seat.

