20 suggestions for improved Ex-inspections

Improved Ex-inspections will reduce explosions and increase efficiency. That is the message from a number of high-end inspection companies which in collaboration have produced twenty specific recommendations.

Based on the relatively high amount of explosions within the last year and a half, a group of experienced inspection companies have chosen to come together and focus on how Ex-inspections can be improved. Moreover, the current market situation forces the industry to focus on optimisation. Here the recommendations include suggestions on how it is possible to gain large savings on man-hours.

The recommendations are created on the basis of the inspection companies' long-standing hands-on experiences from the industry. The focus is mainly that the increased safety and optimisation can be achieved by using electronic systems when performing Ex-inspections.

It is estimated that up to 90 percent of all Ex-inspections are still conducted with pen and paper. But by modernising with an electronic inspection system, it is not uncommon to save between 30 and 60 percent of total man-hours. Simultaneously, safety will improve significantly as data does not have to be entered manually after inspections. An electronic system will instantly make it available both on the individual unit and with onshore management.

The inspection companies involved comprise SafeEx, Atec, Jonas Engineering, Karsten Moholt, Semco Maritime and Proconics. Hopefully, the recommendations will be an inspiration, result in new ideas and create a dialogue.

1: Use an electronic system
It is recommended to use an electronic system for your inspections based on RFID Technology and hand-held tablets. An electronic system will typically save 20 to 40 % on work routines. Depending on the capabilities of the software and how closely you follow regulations.

2: Improve management overview
To avoid explosions, it is recommended that management is more proactive in terms of Ex-inspections and take responsibility for the conduction of the Ex-inspections. To minimize risk, it is recommended to create a culture within your organization in which there is a natural focus on maintenance of Ex electrical equipment

Ex-inspections are not controlled by the class society. The class society do approve the Ex-Register, but does not check if the actual inspections are carried out. As the consequences of negligence or non-conformities can be severe, it is highly recommended to have a management overview that provides information on inspections that have been conducted – and informs the management about critical non conformities found during inspections.

With a management overview you will know the instant status of your units worldwide.

3: Integrate the drawings in the system
When performing inspection of Ex electrical equipment, locating the equipment and marking on drawings is time consuming. And when using paper drawings wind and weather is a big challenge. An electronic system has the drawings integrated in a tablet, and the inspector can instantly find the equipment. The system highlights the equipment that has been inspected. And the drawings are no longer affected by rain and wind.

4: Make better preparations prior to inspections

Make sure hazardous area drawings are updated with the newest equipment. When drawings are not updated, equipment cannot be found and it results in time consuming searching. Furthermore, if an incident occurs it is important to be able to localize the equipment in question.

When the drawings are integrated in the electronic system, it is possible to amend drawings on site. And the onshore personnel can easily retrieve changes from the system and correct the master drawings.

5: Make sure that the inspectors have the right education

Inspectors should have a relevant competency giving education with a practical part. The most commonly known are CompEx and IECEx training. An electronic system will instantly give you an overview of the quality of the inspector's work. You can see if the responses are in correspondence with the objective of the question.

6: Ensure ownership

To ensure a high quality in inspections, the inspector must take ownership – look for detail oriented people with a proud and professional attitude. Personnel with a professional attitude will ensure the highest level of inspection quality and uncover critical non-conformities, which a regular electrician would have missed.

An electronic system will support the inspectors and make sure to guide them through the questions from the IEC 60079-17 Standard, as they vary from location to location.

7: Use service personnel who are familiar with the unit

It is in general recommended to use service personnel who are familiar with the unit, on which they are going to perform inspections. Knowing the unit will most likely improve performance and reduce man-hours. If using a team that is not familiar with your units, it is recommended to use an electronic system that has the drawings integrated in the tablet. This way, it is easy for new personnel to locate the equipment.

8: Do not ignore the "specific conditions of use"

Writing down "specific conditions of use" prior to the conduction of the inspection is time consuming, and therefore, it is in many cases not done. But if there are any insurance matters and the insurance company learns that the equipment has not been maintained in compliance with "specific conditions of use", it is likely the insurance company will not pay or at least demand a reduction.

By using an electronic system with a hand-held tablet, it is possible to bring the certificates in electronic form, making it easy to verify conformance with "specific conditions of use".

9: Store certificates electronically

Certificates are often a big challenge to source and maintain. The Ex certificates are essential for performing the inspections, especially for equipment with specific conditions of use.

Some electronic systems have a built in database for storing certificates. The advanced systems will also have a joint model database across units and customers.

10: Use photo documentation

During inspections, it is recommended to take photos at least of the non-conformities. Photos will fully document the status of the equipment. If doubts, a photo with a date stamp will prove the status of the equipment. The disadvantage is that it is time consuming to upload the photos

Using an electronic system, taking photos and uploading them is done in one operation. Once the photo is taken, it is automatically uploaded into the database.

11: Secure full audit trail
Today management has about 80 % audit trail. When printing instructions from an ERP system, you have no audit trail that the equipment is actually inspected. Even worse, you have no audit trail of any critical non-conformities.

When using RFID-chips on the equipment and hand-held tablets with a RFID-scanner in inspections, management will have a full audit trail of all processes and secure proof of presence.

12: Motivate the employees
Avoid major accidents by motivating the employees – neglect can lead to prison. Inspectors are fascinated by inspecting equipment, not doing secretarial work and entering data into a computer. Remember that optimized processes will make engineers more motivated.

13: Check the quality of external inspectors
If suspicions about an external inspector not living up to expectations arise, his abilities should be tested. There are tests available with multiple choices. An alternative could be just going through the inspections already conducted.

An electronic system will guide the inspector through all relevant questions. If an inspector has less experience, the system will guide him. Furthermore, the manager onshore immediately sees the responses and recognize if support or training is needed.

14: Optimize the reports
Producing the report is one of the most time-consuming parts of an Ex-inspection, especially when including photos. The report is necessary as it serve as documentation. If the report contains photos it is a lot more useful, as it is easier to identify the non-conformities.

Using an electronic system in producing the reports, including necessary photo documentation is just a matter of minutes - there are huge savings to be made here. All data is already in the system and only needs to be organised by the system itself.

15: Rectify non-conformities immediately
To optimize value creation, management need to make sure outstanding non-conformities are rectified. If management do not rectify the identified non-conformities, no benefits were obtained by the inspection and safety was not improved.

With an electronic system, it is possible to observe the outstanding non conformities almost immediately and even get an alarm, if they have not been rectified within in a certain time frame.

16: Optimize the updating of data in the ERP-system
Updating the Ex-register is part of the Ex-inspection. In the manual process, the third party company notes the changes on a piece of paper, then conducts an Excel sheet with the register changes and sends them to the onshore personnel who then types or import it into the ERP-system.

By using an electronic system, the minute you change the data on site the data is considered changed, all the way into the ERP-system.

17: Add extra questions to the checklist

The Ex-inspections according to IEC 60079-17 is the minimum requirements. Adding extra questions to the inspection will improve data. There are many reasons to adding questions to the already defined checks, e.g. if a particular error outside the checklist occurs more often than usually.

Additional questions will give a better overview of the status of the unit.

18: Optimize changing of the drawings

If equipment is in a different physical location than indicated in the drawings, this will need to be rectified. Traditionally, it is done by marking the drawings (redlining) and sending the physical drawings onshore with the changes.

With the right electronic system, the drawings are displayed on the tablet. The inspector can easily change position and the changed drawings are available onshore for the personnel to correct.

19: Use a tablet-based electronic system

If using an electronic system, it is recommended to use one that is communicating with tablets or smartphones. It is not advised to use systems operating on PDAs.

PDAs have low capacity. They cost three times more as for instance a smartphone approved for zone 1. The PDAs cannot handle drawings or photos, or the ability to bring manuals and certificates onto the site.

20: Use high frequent 13,56 MHz RFIDs

When using RFID chips, we recommend to use high frequent 13,56 MHz RFIDs. All consumer technology is working with NFC scanners, working on this frequency. In the current market, the available tablets can only scan the high frequent RFID chips, at least so far.

The 20 suggestions for improved Ex-inspections is completed in collaboration between SafeEx, Atec, Jonas Engineering, Karsten Moholt, Semco Maritime and Proconics.