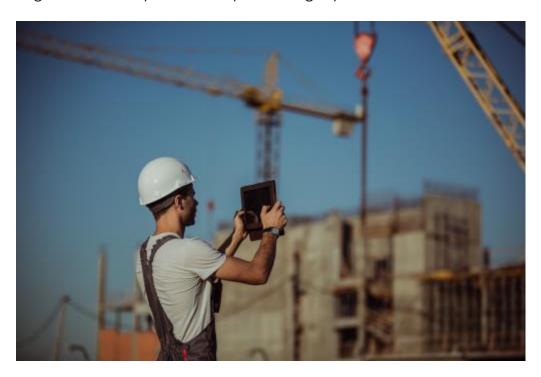## Use Case Scenario

Industry 4.0: Augmented Reality Maintenance Planning
Aegex10 IS Tablets + Virtualware Solutions

Industry 4.0, or the digital transformation of industries, represents the "fourth industrial revolution" in the development of an Internet of Things, Data and Services. It connects embedded system production technologies and smart production processes to pave the way to a new technological age that will radically transform industry, production value chains and business models. Aegex and Virtualware present a use case scenario in which augmented reality and Industry 4.0 are tightly connected.

The Situation:

A European **utilities company** wants to improve the efficiency of its maintenance operations for an urban subterranean electrical grid. The network is dispersed over a large geographic area and encompasses many component parts, each of which need routine inspection to ensure they are functioning properly. Any malfunction in one part of the network could cause a shutdown of the entire grid, so proper upkeep is essential.

The Challenge:

Most parts of the underground electrical system are classified as **hazardous locations** where highly combustible materials are present. Maintenance operators and inspectors cannot use electronic equipment that is not certified for **ATEX/IECEx Zone 1 hazardous areas** because non-certified equipment could cause a spark that could potentially ignite an explosion. Maintenance crew have been using pen and paper to document conditions in the field sites and then entering data into digital systems when they return to their laptop or desktop.

Requirements:

The company is seeking a **mobile**, **cloud-based solution** that will **improve the efficiency** of maintenance inspections, reports, inventory and repair. Inspectors would like to be able to:

- identify the location of various components of the electrical grid
- inspect the components' functionality
- document components' status
- report resulting data onsite
- communicate with teammates during inspections
- visually share and discuss any questionable components

To perform these functions, maintenance crew need a mobile device that is specially certified for these dangerous Zone 1 areas, plus appropriate software applications that allow them to complete these tasks in real time.

The Proposed Solution:

The proposed technology solution for this utility is the Aegex10 Intrinsically Safe Tablet in conjunction with an augmented reality technology app for Maintenance Planning.

The **Maintenance Planning app** is developed by Spanish technology company Virtualware. Used on the Aegex10 IS Tablet, operators can carry the app with them to do inspections, even in **Zone 1 hazardous areas**, have access to **real-time** information with the tablet's **4G LTE or Wi-Fi** connection.

Hardware

Using the **Windows-based Aegex10 IS Tablet**, operators can enter the most volatile hazardous areas (**ATEX/IECEx Zone 1; UL Class I,II,III Div 1**) and employ all relevant Windows 10 applications.

Certified for ATEX Zone 1 hazardous locations, as well as equivalent areas in North America (UL Class I, II, III Division 1) and international (IECEx Zone 1), the Aegex10 operates on **Wi-Fi** or **4G LTE** from any hazardous location around the globe on a **unified platform**.

> "Thanks to the Aegex tablet, we can offer turnkey solutions that empower people in their jobs and permit them to make quick and effective decisions, improving response time, reducing errors, and, therefore, increasing the benefit to companies."
> --**David Moreno**, Chief Revenue Officer Virtualware

The 10.1-inch Windows-based tablet is rated **IP65** rugged for industrial use, yet is lightweight and priced as low as non-certified devices. Its Windows 10 operating system gives users uniform access to the Microsoft cloud, plus apps and services, including custom-designed software like Virtualware apps.

Software

The **Virtualware Maintenance Planning** app is a mobile augmented reality application that shows the geolocation of field assets and permits operators to plan maintenance inspections, review all assets, consult technical data, report findings and schedule repairs

in real time. All the information is stored in Microsoft Azure cloud-based platform using the tablet's **4G LTE or Wi-Fi** connection.

The app allows users to identify the location of underground and security assets (cables, wires, transformers, security cameras, etc.) using Augmented Reality and geolocation through the GPS function of the mobile device. The application overlays the security and underground electrical infrastructure over the real-world view using the tablet's camera to identify components' locations and aid in maintenance procedures.

The Results:

Using the Aegex10 IS Tablet, maintenance crew can enter the most volatile hazardous areas (ATEX/IECEx Zone 1; UL Class I, II, III Div 1) and assess the maintenance situation without fear of causing an explosion.

With the **Aegex10 IS Tablet** running the **Virtualware Maintenance Planning** solution, operators can

- easily obtain information about an existing installation's status and maintenance updates
- identify the exact location of the problem without risking damaging other parts of the system
- pinpoint the specific assets in question within complex underground systems
- perform a virtual classification of all elements of an installation
- upload information to a Microsoft Azure cloud-based platform

Operators can also use a number of Windows 10 applications to communicate information to teammates, such as:

- Opening a <u>Skype for Business</u> line to speak directly and show visually the item in question
- Using <u>Exchange/Outlook</u> to email photos or other data

The Virtualware apps sync easily with companies' existing IT systems, and can be used anywhere in hazardous locations via the Aegex10 IS Tablet. They are also **viewable offline** when wireless networks are not available. The solution is transferrable across different geographies since the Aegex10 IS Tablet is **certified worldwide**.

The **Virtualware + Aegex10 IS Tablet** solution makes maintenance inspections and repair planning simpler and quicker, even in hazardous areas.

The **Aegex + Virtualware solution** would allow the utility to:
- ➢ **increase efficiency**
- ➢ **increase accuracy**
- ➢ **reduce redundancies**
- ➢ **reduce risk of loss**

Resulting in:
- ➢ **enhanced safety**
- ➢ **improved productivity**

<u>Contact</u> Aegex for more information.