What is AEF and What Will it Do For You?

Ken Edwards, Association of Equipment Manufacturers North America

AEF is an acronym for Agricultural Industry Electronics Foundation and is focused on enhancing the use of electronics in the farming industry through the resources and knowledge of its members.

Why AEF?

- Support implementation and adoption of International Standards
- ISOBUS started slowly in 2001
- Since 2005, rapid growth in ISOBUS applications
- Many companies involved worldwide
- Different interpretations of standard
- Incompatibility issues
- Different marketing approaches
- ISOBUS "Prepared", ISOBUS "Light"
- Customer frustration and confusion

AEF was formed in 2008 and currently has more than 120 member companies and continues to grow quickly. It is run by a Steering Committee comprised of the seven founding members: John Deere, AGCO, CLAAS, CNH, Kverneland, Poettinger and Grimme, and two associations, AEM (Association of Equipment Manufacturers North America) and VDMA (German Engineering Federation). The foundation was formed in 2008 but has roots back to 2001 when two separate organizations, one in Europe and one in North America, were working on similar projects. Combining the two organizations to provide a single international body made the most sense.

Electronics as a Driver of Innovation in Ag industry

AEF promotes technical compatibility, efficiency of resources, and functional safety of agricultural machinery. Electronics have become a crucial driver of innovation in agricultural technology promoting the AEF vision for ISOBUS and reaching out to those companies who would like to join this effort.

Figure 1. **Service and Diagnostics Database**

ISOBUS Data Base that can be used to verify the compatibility of ISOBUS devices, troubleshooting and tracking of service information.

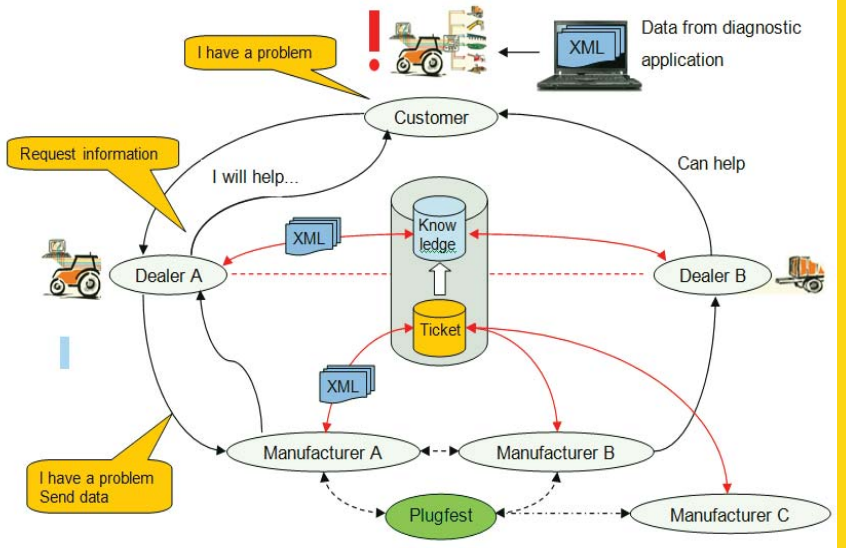

Figure 2. **Conformance Test (CT) Tool**

ISOBUS Conformance Test Tool for use by Test Institutes and Companies. The Tool will provide consistent and accurate evaluations of an ISOBUS device's conformance to the current ISOBUS standards.

Benefits of the tool ⟶ CT-Group

- The Conformance Test will become an Agricultural Industry Standard
- The Conformance Test is mandatory to feed the database
- The Conformance Test approval will improve the quality of products in the marketplace and reduce potential product liability

The complexities of the vast amount of electronic equipment on the market resulted in a need to produce an electronic communications standard (ISO 11783). There are nine AEF project teams that have been working towards integration of the tractor and its implements, and between components within tractors and implements crossing all brands.

Electric drives, hence high voltage, are rapidly gaining importance in agricultural engineering. The AEF has therefore established its newest project group named "High Voltage." The new Project Group is aimed at working out a proposition for the standardization of an interface on the tractor providing external implements or components with electric power. The pretension is that with this interface any implement will run its electric motors with any tractor, only limited by the power of the engine. The target is an accepted specification that should become a standard as soon as possible. Five subgroups are already working on special topics: physical interface for implements, requirements of implements, safety and risk analysis, specification of interface, requirements regarding communications and power, as well as cooling.

How does AEF work? AEF has nine project teams made up of volunteer expert engineers from member companies. Each project team has a leader and project plan. Most of the teams also have working groups to support them, in some cases as many as seven working groups. The teams are coordinated through central project planning with critical milestones defined. The three most recent teams added to AEF are cameras, farm management information software, and high voltage.

What are the AEF results? One of the first results was to develop a common understanding and universal adapter for ISOBUS "plug and play."

The AEF service and diagnostics team developed a database that tracks certified ISOBUS components/devices and shows compatibility between tractors and implements. This database was launched at Agritechnica in 2011 and was awarded the top prize for innovation. This database will be licensed to manufacturers and dealers to help troubleshooting in 2012. A sketch of the way the database operates is shown in Figure 1.

In parallel, the AEF conformance test team developed a test tool with the benefits and advantages (Figure 2).

Results have been achieved by the functional safety team which has developed guideline documents to ensure safe operation. Communications and marketing teams have produced materials and brochures in five languages and the AEF website to support AEF products and member services. The engineering and implementation group has developed functionality documents to support the conformance test database. AEF prides itself on offering two Plugfests each year to members. One Plugfest is held in Europe the other in the U.S. at the University of Nebraska-Lincoln, national tractor test laboratory.

These Plugfests attract greater than a hundred engineers from at least 12 countries around the world. It is a hands-on event where different types and brands of ag equipment are connected to electronic controls to identify any incompatibilities.

What does this mean for equipment end-users? It's a win-win situation for end users. Imagine a situation where equipment problems can be quickly solved and there are no worries about nonstandard adapter equipment being replaced. Everything is made to plug-and-play between tractors and implements. Optimizing farming efficiency through reduced downtime and simplification of replacement parts to plug-and-play are what AEF is working towards. Not only tractors and implements are involved but also self propelled harvesters and wheel loaders. For more information about AEF please visit www.aef.org or email www.aef-online.org.