May 14, 2015

To: T&B Control and Communications Network Committee  
T&B J1939 Functional Safety Task Force

The J1939 Functional Safety Task Force is developing a project to evaluate proposed guidelines for SAE J1939 communication networks with respect to their potential to achieve specific safety levels. A project description is attached.

This project is being planned to be administered under the SAE Cooperative Research Program (CRP). For those unfamiliar with the SAE CRP, a description could be found at http://www.sae.org/standardsdev/tsb/cooperative/overview.pdf.

As this project will require some level of funding to execute, your organization is being approached to determine your interest in joining this new CRP project as a participant. A new SAE CRP group will be formed comprised of the funding participants/partners. A funding participant/partner will be required to make a funding commitment of $5000. Participation will entitle the organization to be a voting member of the CRP group, provide input/guidance to the detailed scope and conduct of the project and receive all project results, data and deliverables. The detailed deliverables will only be made available to the partners.

Participation will enable you to leverage your funding with your peer organizations to receive the results at a fraction of the cost that would be required if done individually. This project will only be accomplished with suitable interest from the industry and on a funds available basis.

Please confirm your intent to participate and your commitment to the funding level of $5000 by responding to Gary Pollak (gary.pollak@sae.org) by June 5, 2015.

Please do not hesitate to contact Gary Pollak – SAE (above e-mail) or 724 772 7196 for CRP questions or Ron Landman – Chair of J1939 Functional Safety Task Force (LandmanRonaldG@JohnDeere.com) or 701 451 3611 for project technical questions.

Thank you for your consideration.

Best Regards,

Gary Pollak
SAE Cooperative Research Program Manager
Proposed Cooperative Research Program (CRP) for J1939 Functional Safety Communication

Statement of Purpose:
Evaluate proposed guidelines for SAE J1939 communications networks with respect to their potential to allow systems designers to achieve specific safety levels.

Background information
Industries represented in the SAE J1939 Truck and Bus Control and Communication committee
- Heavy (on highway) trucks
- Construction equipment
- Agricultural (off highway) equipment

Some of the safety standards that the industries using J1939 must comply with.
IEC61508
ISO15998 earth moving
ISO25119 agricultural machines
ISO26262 to be balloted to include trucks in 2018

Approach:
Sponsor and direct work of a recognized safety certification organization or qualified academic institution to evaluate proposals against selected criteria.

Goals:
1. Determine the network reliability of the safety header message (SHM) approach. This is the communication portion of the system. This number and the analysis method to determine it shall be used by OEMs in specific functional safety system design.
2. Determine the SHM approach and constraints to be SIL 2 capable.
3. Determine under what conditions, if any, the SHM approach could help to achieve SIL3 with a single network. (expanded CRC, data inversion, …)
4. Use the evaluation to act as an authoritative source for our guidelines and provide a reference calculation method.
5. Timeframe – 6-12 months

Open Questions:
1. Can we compute the reliability number for the network and map it to a desired standard?
2. Should the failure reaction be considered in the analysis? Fail off, fail operational

Data Requirements:
Hypothetical use cases. For example, …
Outcomes:

1. A calculation method and example calculations of the SHM approach showing a capability of reaching SIL 2.
2. A set of conditions and constraints under which SIL 2 may be attained OR limitations that prevent it.
3. A set of conditions and constraints under which SIL 3 may be attained OR limitations that prevent it.
4. The rights to publish these results in SAE documents.