

# Feedback collected at SFERA Stakeholder Workshop, 05/11/2018

With responses by the Working Group



Poster	Type of feedback	Feedback content	Responses by the Working Group
Overview and relation to ATO	Question	Is there any room for competition between manufacturers?	Yes. One of the goals of SFERA is to stimulate fair competition between manufacturers. Adopting a standard for DAS communications decreases the risk of "lock-in" to a single vendor.
Overview and relation to ATO	Question	How to get other countries to use the standard? If widely used the costs will drop. A PR Campaign in 2020?	The WG is working on a communication strategy to promote the SFERA IRS.
Overview and relation to ATO	Question	UNISIG Subset 126 is SFERA at vice-versa or just a template?	SFERA is designed so that all information contained in Subset-126 can be expressed in SFERA (i.e. Subset-126 is a "subset" of SFERA). A traceability matrix to compare SFERA and Subset-126 will be made.
Overview and relation to ATO	Question	Additional information for train drivers (e.g. reason for a longer journey) also in discussion?	This topic is currently under discussion in the WG.
Overview and relation to ATO	Comment	There are existing ATO solutions without ETCS.	Yes, this is possible. In that case SFERA can also be used. Subset-126 is only intended for ETCS Full Supervision.
Overview and relation to ATO	Comment	Train parameters are on-board for built-in DAS solutions.	Yes, this can be. SFERA needs to have these parameters as not all DAS will have the correct train parameters.
Overview and relation to ATO	Comment	It seems strange that actual capabilities of trains are sent from TMS to the train.	If DAS is on a tablet, it may not be aware of the train capabilities and therefore the TMS needs to send them.
Overview and relation to ATO	Risk	Advice can be not according to the signal aspect.	Yes, this can happen. An explanation will be included in the IRS.
Overview and relation to ATO	Risk	ETCS/ATO suppliers will go their own way instead of embracing the IRS 90940 as standard for both ATO over ETCS and DAS.	This is an important risk that the WG is seriously considering; one of the aims of the Stakeholder Workshop was to reduce this risk. It is to be noted that Subset-126 is only usable on lines with ETCS Full Supervision.
Core Use Cases	Question	What Train Type elements can the driver change? What Train function degradation can the driver / integrated DAS change?	This is going to be fully detailed in the IRS while addressing Board-to-Ground messages.
Core Use Cases	Risk	Drivers can already be required to input train information in multiple safety systems before start. There is a risk that drivers will not input this information because they do not have the time to do it.	The TMS should already have the correct information, which (depending on the interface) may be visible to the driver. The goal is to improve the quality of the data by letting the driver provide feedback. - If the DAS is connected to the Train Control and Management System (TCMS), this will not be applicable; - If the DAS is not connected to the TCMS: * Input by the driver is only required if there is a difference between the information given by the TMS and the actual train information. Since the input is not systematic, it is hopefully rare. * The DAS Desktop Management Interface (DMI) ergonomics must be as simple as possible for the driver, so that providing feedback is not too much of a burden.
Core Use Cases	Risk	Drivers have to take action for this to work. Are they prepared to accept that?	
Core Use Cases	Question	Question 1 : Are variations allowed? For example, the driver does not check TCs because another train device can do that. Question 2 : Compatibility with onboard DAS integration in train backbone	Answer 1: We will adjust the use case to permit TCMS to give feedback. Answer 2: The DAS can be connected to the TCMS, but the specification of this TCMS to the DAS won't be part of the IRS. It's an implementation choice.
Core Use Cases	Comment	Drivers should be able to notify TMS that they don't follow DAS advice.	- If a driver doesn't want to use DAS, (s)he shouldn't login at all. - If a driver considers a device not correct at a specific moment, (s)he remains responsible for driving and is not forced to follow the DAS advice. The driver shouldn't be required to communicate that choice to the TMS. The TMS might notice that the DAS advice is not followed. - If communication is needed for emergency reasons, the driver will use other means for this.
Core Use Cases	Comment	Use case for areas without GSM coverage	There is a Use Case for this. All Use Cases will be detailed and included in the IRS.
Core Use Cases	Comment	Can a driver report that the DAS algorithm is wrong all the time	This is not in the scope of the project. Each company will have its own procedures.

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Core Use Cases	Comment	Please include the requirements where you based this solution on. (from a functional perspective).	The IRS will include functional requirements.
Core Use Cases	Comment	You should be able to specify a minimum passing speed at a Timing Point (examples given : a heavy freight train on a steep slope, or a long train at a level crossing)	The WG will take this into account and verify that appropriate elements are available in the XSD.
Core Use Cases	Comment	Use case for missing or incomplete data	A Use Case to get additional data needed (e.g. new Segment Profile or Train Characteristics) is already included. There is first an attempt to collect missing data; if data is actually missing, then no advice can be given.
Core Use Cases	Comment	A DAS should be able to ask for multiple journeys at a time.	Yes, this is possible.
Core Use Cases	Question	Acknowledgement that the DAS has <u>processed</u> new data (JP or SP)	This depends on the implementation of DAS.
Core Use Cases	Question	How to merge preplanned journey data and updated live data ? (ex : for route setting ?)	This is the intention. DAS will merge both through the exchange of Journey Profiles.
Core Use Cases	Risk	Formulation 1 : Algorithm and infrastructure model of the DAS and TMS have to be aligned. If not... Formulation 2 : How to be sure that TMS-DAS are aligned.	Small differences are not problematic. The requirements of the TMS shouldn't be too strict (if not needed).
Core Use Cases	Risk	Differences in granularity of timetable (full minute, 30s, 15s, 10s...) cause inconsistent behaviour of DAS systems programmed around a single "taste". Maybe not directly related to SFERA but important to avoid to achieve consistent behaviour when crossing borders and that is important for acceptance by drivers.	SFERA has time windows which can be adapted to the desired granularity. When granularity differences occurs, this should be solved in the implementation.
Degraded Adhesion Use Case	Question	Why don't you propose to use the ETCS slippery track function?	SFERA is also intended for use on class B systems. But even on ETCS lines this slippery track function is seldom used. ETCS is SIL4, but the information on slippery track is subjective and can never be 100% reliable.
Degraded Adhesion Use Case	Question	Why don't we use the slip/slide protection modules in operation in some rolling stock to inform DAS? DAS can then forward this information to TMS in order to inform other units.	The WG fully supports this idea. This is included in the IRS as part of Subset-126. Implementation-wise, this will be more complex to be integrated with DAS on a tablet-PC or smartphone.
Degraded Adhesion Use Case	Comment	It's not only about adhesion. Also bad view (fog) can be an issue. And what about heat and snow?	This is a good observation. The WG will analyse what extra environmental information might have an impact on the speed profile. Environmental conditions reducing acceleration, maximum speed and deceleration need to be integrated. This might also apply to e.g. damage to railway infrastructure or trees fallen on adjacent track. For some observations the use of radio will still be the recommended solution.
Degraded Adhesion Use Case	Comment	Idea to provide this information to other trains is good, but probably too complex. One train driver considers the situation as 'bad', the next one as 'good'.	This is correct. Some extra recommendation to the ground system can be added. A filter may be needed: e.g. a single observation will have a lower impact than multiple similar observations.
Degraded Adhesion Use Case	Comment	Adhesion factor also depends on train.	This is correct. The implementation has to take this into account.
Degraded Adhesion Use Case	Risk	Drivers perception on adhesion condition.	Obviously the driver's observation is subjective. Grouping information from multiple trains and drivers will make the information more reliable. This is an implementation issue.
Power Supply use cases	Comment	DAS optimization Module is in contradiction with TMS optimization module. Background: If the traffic would be some optimized as it can be (trains are running with shortest headway, all trains are ATO, all of the same type, no slack in the timetable etc.), there would be no margin to cut power peaks	Even if as much optimization as possible is done, the timetable will still need to take care of e.g. dwell time depending on number of passengers, variations in adhesion etc. which will give possibility for power optimization. Also reduction of delays with degraded power supply will still be possible.
Power Supply use cases	Comment	Promising additional potential on top of the direct energy savings & better on time performance	Noted.
Power Supply use cases	Comment	How to distribute the benefits from the IM to the RU to incite the RU to follow the recommendation?	This is a good observation. The benefit might be indirect.
Power Supply use cases	Comment	Reaction time for a forecast has to be fast, less than one second. That makes forecasts unlikely and real time optimization more realistic.	See experiences from the Merlin project.
Power Supply use cases	Comment	Power forecast challenging due to unstable power profile	Yes. Real time optimization or combining forecast with real-time power data for continuous calibration is more promising.

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Power Supply use cases	Comment	Real time power demand from the train to the TMS for immediate reaction or calibration of forecast (this is missing in the sfera-protocol). Now a current can just be sent from the TMS / power system to the train and not in the other direction	The WG will evaluate whether a value for actual current (traction / pantograph) for the train as info to the TMS should be added in SFERA.
Power Supply use cases	Risk	How to convince not technically knowledgeable decision makers that this is something to embrace and invest in	A pre-study is needed which shows benefits, costs, organisational challenges etc. This is outside the scope of SFERA.
Power Supply use cases	Risk	Uncertainties in reaction of driver - does he follow the advice?	If just some drivers follow the advice, it is still better than nothing. The relevance depends on the power supply system and on the geographic focus: to reduce power peaks in a region or in the whole network, the dependency is not on one single driver but on the behaviour of many drivers, which will be to a certain extent predictable.
Power Supply use cases	Risk	Different conflicting algorithms. TMS traffic, power module, energy optimization	Yes, a decision must be made of what is important in each situation. To be considered: signals to control power can be very rarely for already reducing many expensive reserves on the power supply side.
Power Supply use cases	Risk	Responsibility sharing between IM and RU: Who defines the driving strategy? Who pays the energy? Complex system design	Yes, it is a big issue to find the benefits for the whole system and show them for all stakeholders so that they are interested in using such a system.
Power Supply use cases	Risk	Risk of oscillation. Request to reduce power on all trains could result in to big reduction. Instead of reducing sufficient (?) power it results in a power offtake drop followed by a even higher peak	This has to be taken into account when designing such a system. The problem will also look different depending on the size of the feeding area.
Message structure	Risk	SS126 is not yet finalized and will be subject to change process. How to keep Sfera aligned?	The dependency with Subset-126 has been defined by design; the WG will identify a way to manage it.
Message structure	Risk	Implementing the protocol is more complex than the DAS itself	The protocol supports a lot of detail, but not everything is needed to make a useful DAS. A simple DAS will need little data. The IRS will describe the minimal fields needed for an IM and for a DAS-manufacturer.
Message structure	Risk	Limitations in SS126. Will they not be limitations for Sfera?	The comment needs additional specifications. Since SFERA is able to extend Subset-126, it may be possible to overcome some limitations (if present). Some additional data already has been added in the SFERA structure (Train characteristics, signal aspects, location, ...).
Message structure	Question	How are JP's and SP's splitted across a journey?	There is flexibility in how JPs and SPs can be split. This is also dependent on the availability of data and the separation of responsibilities between RUs and IMs in a particular region. The Thalys test gave some examples of how it was done in practice. The IRS will provide some advice and guidance on that topic.
Message structure	Question	Can we share XSD and examples.	In 2019, a draft IRS with the XSDs will be distributed.
Message structure	Question	Energy efficiency depends on tractionpercentage AND current speed. This can not be modeled in Sfera, how is energysaving calculated?	This is implementation specific and depends on the requests of the RU. It's more related to management reporting. Specific information on energy consumption could be RU-specific data that is preloaded on the DAS.
Message structure	Question	Can a TMS do good realtime optimization of traffic when only feedback from train is 'cannot respect timewindow' and 'position'. Doesn't it need ETA that is calculated by the DAS for example?	The TMS needs to be able to handle trains with and without DAS. It will need to make calculations for both. The timing point estimation is included as part of the board to ground message. In some cases a train characteristic update from DAS onboard is needed.
Message structure	Question	In The Netherlands there are some local train movements, that are performed outside control of IM. How does this work with Sfera?	This point is noted. IM and RU need to agree on what train-runs can be part of IRS 90940 data exchanges. There will be even in the long term some parts of the traffic (shunting) or parts of the network (local lines) that are not included in traffic management and/or connected DAS and/or automation.
Message structure	Question	Is it possible to send information to tell the driver the reason/explanation for a journey profile or segment profile update?	This is already included in the messages but not highlighted in the workshop.
Message structure	Comment	How about the DB "ZLR Green Functions" application?	DB is part of the Working Group, so the highest possible level of interaction is sought.
Message structure	Comment	You should add driver id to the message structure	In general IM is not responsible for staffing. The SFERA protocol deals with trains more than human resources.
Message structure	Comment	You should add rolling stock id to the message structure	Only the type and characteristics of the rolling stock are relevant.

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Message structure	Question	What do you do with the impact of wind? How is that communicated with the train?	Wind can be a relevant factor. The Working Group is studying whether and how to include this factor in SFERA.
Message structure	Question	Do you have ack messages (replies)	Yes, acknowledgement messages are in the protocol.
Message structure	Comment	There should be clarity about necessary elements and optional elements	This will be addressed in the IRS.
Communication	Question	Is it possible that a train has to switch between the 3 architectures ?	Yes: the transition can be at entrance/exit of an ATO over ETCS area (switch A-B-A or C-B-C), or if an IM chooses to support only one of the DAS communication architectures (in that case the transition will be at the border between IMs: switch A-C-A).
Communication	Question	Direct communication (setup C): Is there a need to develop direct communication?	For some IMs this setup is really necessary or desired. One of the objectives is to provide a level-playing field for smaller RUs which may not be able (or may not have the resources) to resort to the "back-office" setup (Setup A). Since smaller RUs do not participate directly to the SFERA project, there hasn't been an actual request for this setup yet, but it doesn't mean that it won't be used. From a German project (DB Green Functions) the group learned that there are several DAS-suppliers that want to offer a "RU server" as a service to smaller RUs.
Communication	Question	Are there double running time calculations ?	Yes; Both TMS and DAS need to calculate running time. As they have different goals, and different detail in data, they are separate.
Communication	Comment	ATO over ETCS: I think it was decided that the OB-TS communication is separated from the ETCS communication. And that GSM-R will not be sufficient	This is not the official stance in the published version. It is already decided that a data channel is needed. This was an option in initial GSM-R specification. But it remains in that case 2.5G. Topic is not closed in S2R WG.
Communication	Comment	On this poster: why is there an IM server in setup B versus an IM-TMS in setup C	This is actually the same. It will be corrected and become TMS in all setups.
Communication	Comment	Scheme 2 is not necessary. SFERA has not to replace subset-131	Subset 131 is not yet defined. If the same server is used for setup A, B and C to communicate with RU server, ATO-OB or DAS-OB, it is not possible to use Subset-131.
Communication	Comment	"RU server" should be "RU/DAS server"	Will be corrected.
Communication	Comment	functional assumptions (like calculating running times on TMS and onboard) should be described. This helps understanding the choices and best practices from the SFERA workgroup	Functional assumptions will be mentioned in the IRS.
Communication	Comment	Public communication is also an advantage of architecture A (IM-backoffice to IM-backoffice)	The communication is between IM server and RU server, not between IM's. But yes, this communication will use public Internet.
Communication	Comment	Setup C: why do we need a IM TS-DAS (can't TMS provide the proper SFERA protocol)	IM TS-DAS may be just a subroutine in a TMS. It needs not to be a separate server. This will be explained in the IRS.
Communication	Comment	Disadvantage of Setup C: RU gets no information on the advices	This is true. Setup C is mostly provided for smaller RUs that have insufficient manpower to analyse the data anyway.
Communication	Comment	For built-in DAS in a train, only existing (secure) communications should be used. No additional antennas	To have this, a good interoperable protocol is needed. So far, only country- or vendor-specific solutions seem to be available. RU-specific solutions are already supported without new antennas in setup A.
Communication	Risk	DAS suppliers do not embrace SFERA / IRS 90940 but stick to their own (proprietary) protocols and interfaces. So less or no interoperability and higher costs.	This is one of the risks that sparked the initiation of the project. The Working Group takes this risk seriously and is evaluating possible solutions. The Stakeholder Workshop was one of the initiatives undertaken to mitigate this risk. This is also in the hands of RUs and IMs: they can explicitly ask vendors to support an interoperable protocol (i.e. SFERA).
Communication	Risk	setup A: IM must rely on the RU on proper use of capacity and optimisation of the flow. Big risk.	There is an overall risk in RU trains running over the IM infrastructure, so this additional risk may not be as significant in comparison. The integration will mostly help. The IRS will include requirements on maximum delays for passing by intermediate servers.
Communication	Risk	What is the whole communication time / delay of data transfer from onboard servers to all servers using the different architectures? Real time??	SFERA will define minimum performance requirements (they weren't presented during the Stakeholder Workshop).
Communication	Risk	SFERA draft has to be published early for comments. Otherwise risk of non-acceptance	The WG is working to make this possible.
Communication	Risk	Communication between backoffice and train for different DAS suppliers has to be of similar quality, security etc. The weakest DAS determines performance and security holes.	SFERA will define minimum performance requirements (they weren't presented during the Stakeholder Workshop).

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Thalys Test	Question	DAS process will handle train run data, such as TAF/TAP and energy settlement (or will have to do) --> is there any possibility for mutualization of the process in order to ensure the consistency of the data ?	For SFERA the train composition is needed. But is not necessary to have the exact EVN's. In energy settlement the exact EVN's of the traction units are used to link the train (and the RU running the train) with the data coming from an on-board energy meter. The train composition with or without exact EVN's is part of the TAF/TAP-messages used to standardised the communication between RU and IM (from request to train-path up to e.g. the real time composition).
Thalys Test	Question	Isn't there any standard for driver DMI ? Or shouldn't there be one ?	This is outside the scope of SFERA.