

Annex E (Normative)

Process for adding new data elements to ISO/TS 15143-3

E.1 General

Annex E defines the process for new data elements and schemas to be added to ISO/TS 15143-3 (Hereafter “Part 3”), between Technical Specification revisions, to enable a means to quickly grow the utility of this standard as needed by stakeholders.

- Use this process to update Part 3, which will also require an update to ISO 15143-2 (Hereafter “Part 2”)
- If a proposed change is only to Part 2 (and does not impact Part 3), then use the current Maintenance Agency process (See ISO 15143-1:2010, Annex A also URL: <http://www.jcmanet.or.jp/english/ISO/15143/index.html>).

Changes to existing data elements or other general text in this document will be handled through the normal ISO processes for correcting, revising, or amending standards.

It is important to note that the use of this process will lead to new and revised schemas in .xsd files that do not match the published Part 3 document. So, for stakeholders to utilize new elements defined per the process of this Annex, they will need to reference the .xsd files.

E.2 Guidance on type of data applicable for Part 3

Part of this process is determining if a new element fits within the spirit of Part 3 – some data may not be appropriate. Here are guidelines for data that could be appropriate for Part 3 – ultimately the Maintenance Agency and governing Working Group determine final approval.

- Generally, elements for Part 3 should be machine specific and machine centric (not jobsite/project specific/centric). Element should be valuable with respect to a specific machine
- Elements should fit the category of Machine Management Data, as defined in ISO 15143-1: 2010, 4.9, and support the Machine Management Process, as indicated in ISO 15143-1: 2010, Annex E, E.4.2.
- Data that has value at a data refresh rate that aligns with ISO/TS 15143-3: 2019, 4.1.
 - For example: if the new data proposed only has value if provided “real-time”, then it may ~~is~~ not be appropriate for Part 3

E.3 Roles for the process

There are two general roles in this process:

- 1) Requestor(s) who are proposing new data element(s)
- 2) Maintenance Agency who governs and manages process of adding new data elements

Within the “Requestor” role, at least two stakeholders are required to successfully request a new data element (one Telematics API Provider and one API Consumer). There should not be only one stakeholder type (ie only an API provider or only a Consumer) making a request to get data added to the ISO document. The two stakeholders should be from two separate organizations. The purpose of having multiple stakeholders is to ensure that the new data element has clear, universal value while also being technically feasible.

The objective of this process is to balance speed of implementing changes to the standard against ensuring good quality of material in the standard. Requestors have a responsibility and active role in ensuring updates function properly. Therefore, in addition to filling out the requested information for new data elements, the requestor(s) shall ensure that at least two stakeholders (one telematics provider and one API consumer) have tested the new schema(s).

For updates to be made, there first should be an agreed definition and wording of the data element, and then new XML schema and URL information. Each type of activity requires different skill sets - business/customer stakeholders should confirm definition of the data element, and software/API experts should confirm correct schema information.

E.4 Process for introducing new data element schemas

There are generally 3 phases to this process – here is a high level visual in Figure E.1:



Figure E.1

New Element Request

- Requestor: emails the Secretary of the Maintenance Agency (MA) an initial request to add a new data element, with 1) a high level description, 2) comments on why the proposed new element is appropriate for this standard, and 3) summary of stakeholders who are jointly making this request (to ensure compliance with section E.3 above)
 - Visit the JCMA webpage (<http://www.jcmanet.or.jp/english2017/ISO/15143/index.html>) to find the appropriate email address.
 - All new/requested elements will be considered "optional" in the ISO standard
 - For illustration, here are examples of data elements currently in standard: Fuel Used, Cumulative Load Count, Distance
- MA: will confirm understanding of what the data element is, and its use cases/intent of the data.
- Working Group Approval:
 - MA: Submits poll to Working Group, with information provided by requestor, with request for any members who disagree with adding the new element to the standard. Working Group members shall respond within 14 calendar days. If a Working Group member responds with disagreement or it is unclear that the new element fits into the standard, MA may decide to call a Working Group meeting (either teleconference or face/face) for discussion and feedback.
 - MA: Within 30 calendar days of initial correspondence from the Requestor, the MA will notify Requestor that either 1) proposed element is accepted conceptually by Working Group, 2) Working

Group does not accept the proposed addition with explanation, or 3) that the Working Group needs to have further discussions on the proposed data element, along with planned next steps.

New element definition and schema development

- Requestor: If MA agrees that this proposed element fits in **Part 3**, then the Requestor fills out the needed information which defines attributes that describe the data element. This information is outlined in the following folder, where a spreadsheet is available to use for filling this information out. A copy of this spreadsheet should be saved and submitted to the MA once completed with the needed information.
 - <http://standards.iso.org/iso/15143/-3>
- The requestor should work with other key stakeholders to ensure alignment of key attributes
 - For example, in North America, this could be reviewed with the ANSI Subject Matter Expert team comprised of members from AEM
 - The purpose and use cases of the new data element shall be clearly defined to ensure there is value
- Requestor (or designated API expert): creates and updates .xsd schemas, using the information entered into the above XL sheet:
 - Updates Common Schema .xsd
 - Each Common Schema update shall be based on previous versions of schema, in order to maintain a single branch of code/text.
 - MA will ensure there is only one version of the Common Schema being updated, and there are not multiple Requestors working on the Common Schema in parallel
 - Add in new element and type
 - Update the Fleet object to include new type
 - Create new, element specific time series schema
 - .XSD would reference a type that's getting added to the Common .xsd
- Requestor: To help ensure alignment of design and functionality, the Requestor shall ensure that at least two stakeholders (one telematics provider and one API consumer) have verified functionality of the new schema(s). Possible verification activities include:
 - Unit testing of schemas (schema validation)
 - Utilize a simple tool (example: could be a simple online validation tool or basic application). Use this tool to test that .xsd is valid
 - Validate both the Common .xsd updates as well as the new time series .xsd
 - User acceptance testing
 - Two stakeholders implement the proposed changes into their API and consuming software. Acceptance testing is performed in a user environment that resembles the production environment, using realistic data. However, application does not need to be a currently available product for sale - could be a "beta"
 - Verify that delivered data meet Requestor's stakeholder's requirements.

- Requestor: sends the following completed information to the MA:
 - 1) Notification that .xsd's have been updated and verified, along with a copy of the updated .xsd's
 - 2) Final copy of XL sheet
 - 3) List of companies and team members who have been actively participating in this request, to demonstrate level of industry wide interest in this change.
 - 4) Summary of verification activities completed and by which companies
- Working Group Approval:
 - MA: checks the submission for suitability and completeness.
 - MA: submit poll to Working Group, with information provided by requestor, with request for any members who disagree with releasing the new element. Working Group members shall respond within 30 calendar days. If a Working Group member responds with disagreement, MA may decide to call a Working Group meeting (either teleconference or face/face) for discussion and feedback.
 - MA: Within 60 calendar days of correspondence from the Requestor submitting the final information, the MA will notify Requestor that either 1) Working Group has reached consensus to release the new element, 2) Working Group has not reached consensus with explanation of concerns, or 3) that the Working Group needs to have further discussions on element, along with planned next steps.
 - Further revisions to submitted information may be needed, after Working Group review

New Element Release

- MA: cut/paste XL sheet information from Requestor into the master XL tracking sheet in the ISO folder. (see Figure E.2).
- MA: create a new sub-folder on the ISO folder site, with title that is an ISO formatted date code that corresponds to the date that the element(s) and information was approved by the Working group
 - Examples: 20180801, 20190615, etc
- MA: copy new .xsd's to this new folder. By copying these files to this folder, the .xsd's are considered "released".
 - The Common.xsd in the new folder will be the new master version of the Common Schema. It will contain all current and past data element information
 - All .xsd's will be copied to this folder, even those that have not been changed, to provide one location to go for the most up to date schemas while also preserving levels of maturity for older revisions as new folders are added.
 - Older folders will not be deleted, to preserve stakeholders' use of older revisions, if desired.
- MA: email the members of the Working Group with a notification that the proposed changes have been released.

E.5 Input to Part 3 Technical Specification revision process

Over time, the Maintenance Agency will collect and stores change requests listed above. Requested new data elements descriptions will be collected and bundled together into major releases/revisions of the ISO standard. This is to reduce the number of version changes of Part 3. This major revision process will

follow normal ISO procedures for revising a Technical Specification. During the revision process, the Working Group will use the latest XL sheet, defined in Table E.1, as guiding information to update Part 2 Data Dictionary and update Part 3.

<http://standards.iso.org/iso/15143/-3>

[AverageDailyEnginalLoadFactor.xsd](#)
[CautionCode.xsd](#)
[common.xsd](#)
[cumulativefuelused.xsd](#)
[CumulativeIdleHours.xsd](#)
[CumulativeIdleNonoperatingHours.xsd](#)
[CumulativeLoadCount.xsd](#)
[CumulativeNonproductiveRegenerationHours.xsd](#)
[CumulativeOperatingHr.xsd](#)
[CumulativePayloadTotals.xsd](#)
[CumulativePowerTakeOffHours.xsd](#)
[DEFremaining.xsd](#)
[Distance.xsd](#)
[ed-1](#)
[EngineCondition.xsd](#)
[FaultCode.xsd](#)
[FleetTS.xsd](#)
[FuelRemaining.xsd](#)
[FuelUsedinthepreceding24hr.xsd](#)
[IsEngineRunning.xsd](#)
[Locations.xsd](#)
[PeakDailySpeed.xsd](#)
[SwitchStatus.xsd](#)

The .XSD files are located at this URL

The original list of .xsd's, released with the first edition of the ISO standard, will be stored here in the root folder. They must remain in this folder, to comply with the URL's in the first edition

Figure E.2 — Data Element MA Submission Diagram

This XL sheet contains the list of new elements added to the .xsd's. The list of elements will be indexed by the date code of the folder in which updated and new .xsd's are released, so interested stakeholders can see which .xsd release introduced each new element

Table E.1 Data Element Spread Sheet

Overall Data Element name	Overall Schema element name	Overall General definition	Attributes of overall data element	Attribute schema name <i>Note: Format should match name of corresponding .xsd as: -Release - Revision - Controller, first letter of each</i>	Definition of Attribute
201808	Battery Voltage	Voltage level of the battery	1 Date and time	DateTime	The date and time indicates when the machine is the specified voltage level
			2 Voltage level	VoltageLevel	Data type is decimal
201808	Grade control design name	Text name of the design file that the grade control system is using for control	1 Date and time	DateTime	The date and time indicates when the machine is the specified voltage level
			2		
201906	Boom extension	Boom extension percentage tracking and tracking number of times a boom was extended over 80%	1 Date and time	DateTime	The date and time indicates when the machine is the specified voltage level
			2 Percentage		This field indicates the estimated percentage the boom was extended over 80%. Its data type is double maximum of 3 digit to the left of the decimal and up to the right of the decimal. It includes all up to 999.999
202008	Operator ID	The Operator ID identifies the specific operator of the machine, and is defined by the enclosure	1 Date and time	DateTime	The date and time indicates when the machine is the specified voltage level
			2		Because this field is defined by the end user, its unique identifier, its data type is string, and is to be unbounded.

ISO15143_3 Table E_1

- 20180901
 - 20190801
 - 20200801
- [AverageDailyEngineLoadFactor.xsd](#)
 - [CautionCode.xsd](#)
 - [common.xsd](#)
 - [cumulativeFuelUsed.xsd](#)
 - [CumulativeIdleHours.xsd](#)
 - [CumulativeIdleNonoperatingHours.xsd](#)
 - [CumulativeLoadCount.xsd](#)
 - [CumulativeNonproductiveRegenerationHours.xsd](#)
 - [CumulativeOperatorHr.xsd](#)
 - [CumulativePriorityTasks.xsd](#)
 - [CumulativePowerTakeOffHours.xsd](#)
 - [DEFRemaining.xsd](#)
 - [Distance.xsd](#)
 - [e0-1](#)
 - [EngineCondition.xsd](#)
 - [FaultCode.xsd](#)
 - [FleetITS.xsd](#)
 - [FuelRemaining.xsd](#)
 - [FuelUsedInThePrevious24hr.xsd](#)
 - [IsEngineRunning.xsd](#)
 - [Location.xsd](#)
 - [PeakDailySpeed.xsd](#)
 - [SwitchStatus.xsd](#)

As new elements are completed, a new folder will be created and the latest versions of the .xsd's will be pasted here, including .xsd's that were not modified. This is essentially the "release process" that makes the newest .xsd's available to the public. Interested stakeholders can go to the folder with the most recent date code name in order to find the newest .xsd files

Figure E.2 — Data Element MA Submission Diagram (Continued)

Table E.1 — ISO/TS 15143-3 new element description table in detail

Revision Date Code	Data Element name	complexType name	Overall General definition	Attributes	Element name for each attribute <i>Note: Format should match normal conventions, such as: - No spaces - Capitalize first letter of words</i>	Attribute definition	Response Example	Format / Unit	Range	Endpoint	Should it be listed in 8.2.1 Fleet snapshot? (Yes or No)	Should it be listed in 8.2.2 Single element snapshot? (Yes or No)	Should it be listed in 8.3.1 as General Time Series data? (Yes or No)	Who uses the data?		How is the data used? Data usage scenarios	List of sub services (see ISO 15143-1:2010 Table 1)
														Site Manager (Productivity) (Yes or No)	Machine Manager (Health) (Yes or No)		
				<i>Date and time</i>	<i>DateTime</i>												
				<i>Unit of measure of XXX</i>													
				??													
				??													
				<i>Date and time</i>	<i>DateTime</i>												
				<i>Unit of measure of XXX</i>													
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				<i>Date and time</i>	<i>DateTime</i>												
				<i>Unit of measure of XXX</i>													
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														Site Manager (Productivity) (Yes or No)	Machine Manager (Health) (Yes or No)		
				<i>Date and time</i>	<i>DateTime</i>												
				<i>Unit of measure of XXX</i>													
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														Site Manager (Productivity) (Yes or No)	Machine Manager (Health) (Yes or No)		
				<i>Date and time</i>	<i>DateTime</i>												
				<i>Unit of measure of XXX</i>													
				??													
				??													