GS1 Industry & Standards Event 2019
9-13 September 2019 – Lisbon, Portugal

*Transforming business together*

Session: GS1 in rail: on track
Time: Wednesday, Sept. 11th, 13:30 – 15:30hrs

Who may attend: Everyone

Speaker(s): Enzo Blonk (host), Diana de Bernardy, Thorsten Kirschner, Uwe Rüdel, Sue Schmidt (speakers)
Anti-trust caution

• GS1 operates under the GS1 anti-trust caution. Strict compliance with anti-trust laws is and always has been the policy of GS1.

• The best way to avoid problems is to remember that the purpose of the group is to enhance the ability of all industry members to compete more efficiently.

• This means:
  - There shall be no discussion of prices, allocation of customers, or products, boycotts, refusals to deal, or market share.
  - If any participant believes the group is drifting toward impermissible discussion, the topic shall be tabled until the opinion of counsel can be obtained.

• The full anti-trust caution is available via the link below, if you would like to read it in its entirety: http://www.gs1.org/gs1-anti-trust-caution.
Meeting etiquette

- **Meetings will begin promptly as scheduled**
- **Be present – avoid multi-tasking**
- **Avoid distracting behaviour:**
  - Place mobile devices on silent mode
  - Avoid sidebar conversations
- **Be considerate**
  - Avoid monologues
  - Keep comments concise
- **Respect work group decisions**
  - Avoid re-opening decisions unless there is a significant quality impact
- **Collaborate** in support of meeting objectives
  - Ask questions
  - Be open to alternatives
- **Be representative**
  - Avoid personal remarks
  - Do not speak for your company or community if you do not clearly understand their needs
  - Votes should reflect the needs of your company or community
WiFi internet access

• Select network “Sheraton Lisboa” and connect
• Password: GS1events
Today’s Agenda

• Some Industry background and stats
• GS1 standards implementation.....@ full speed
• GS1 Standardisation Requirements
• MO Updates
• Looking ahead....events
• Q&A
RAIL

Some Industry background and stats
World Rail Market

- New level of competition reached
  - More regionally focussed OEMs expanded geographically → they compete on global level
  - They enter 3rd (often newly emerging) railway markets and
  - They enter (traditional) home markets of other large rolling stock manufacturers
  - Growing (technical) requirements complicate both development and customising processes → require an even larger sales market to reach level of profitability
Western Europe and Africa/Middle East are expected to show strongest growth rates – Asia Pacific to remain at high levels

Total market growth rates per region [CAGR\(^1\), %]

- **World rail supply market**: 2.6%
- **NAFTA**: 2.6%
- **Western Europe**: 3.1%
- **Eastern Europe**: 2.8%
- **CIS**: 0.9%
- **Latin America**: 2.3%
- **Africa/Middle East**: 3.0%
- **Asia Pacific**: 2.6%

\(^1\) Compound annual growth rate 2019-2021 vs. 2013-2015
<table>
<thead>
<tr>
<th>Year &amp; Ref</th>
<th>Turnover (in €)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>€ 47.0 bn</td>
</tr>
<tr>
<td>Austria</td>
<td>€ 3.2 bn</td>
</tr>
<tr>
<td>France</td>
<td>€ 3.8 bn (€ 1 bn for export)</td>
</tr>
<tr>
<td>Germany</td>
<td>€ 11.8 bn</td>
</tr>
<tr>
<td>United-Kingdom</td>
<td>€ 11.3 bn (22.59 bn / 2 years)</td>
</tr>
<tr>
<td>Australia</td>
<td>€ 3.2 bn</td>
</tr>
</tbody>
</table>

1 APA-OTS - Wirtschaftsfaktor Schienenverkehr und Bahnindustrie (12 September 2017)
2 Fédération des Industries Ferroviaires
3 Statista.com - Umsatz der deutschen Bahnindustrie von 2005 bis zum Jahr 2017
4 Office of Rail and Road - UK Rail Industry Financial Information 2015-16 (22 February 2017)
5 ARA – Rail Manufacturing – Keeping the Nation on track
Worldwide distribution of manufacturers and sites

*Manufacturers* refers to all rail vehicle companies with their global headquarters in the region.
*Sites* refers to all manufacturing facilities in the region, including plants of manufacturers from other regions.
Global market for Vehicle Maintenance

Profile: World

<table>
<thead>
<tr>
<th>Market volume 2011</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After-sales</td>
<td>EUR 38 500 million</td>
</tr>
<tr>
<td>Light maintenance</td>
<td>EUR 25 400 million</td>
</tr>
<tr>
<td>Heavy maintenance</td>
<td>EUR 10 000 million</td>
</tr>
<tr>
<td>Refurbishment</td>
<td>EUR 3 000 million</td>
</tr>
<tr>
<td>Information: new vehicles</td>
<td>EUR 47 500 million</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market development 2011–2016</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After-sales</td>
<td>+3.4%</td>
</tr>
<tr>
<td>New vehicles</td>
<td>+3.1%</td>
</tr>
</tbody>
</table>

© SCI Verkehr GmbH
RAIL

GS1 standards implementation.....
@ full speed
# Life Cycle Traceability in Rail value proposition

## Target
**Who is the target audience?**

All parties involved in rail manufacturing, maintenance, repair, and overhaul processes (MRO). These include: Manufacturers (system integrators, system manufacturers, and component suppliers), Operators (infrastructure and transport), Service providers (MRO workshops, project contractors, logistics service providers), and Regulators.

## Need
**What important issue do they have?**

- Further improve safety of passengers and cargo.
- Improve performance, reliability and quality of train systems and components impacting the quality of the offer to its customers.
- Adapt to the liberalisation of the rail market and the increased globalised supplier structures
- Comply with rail regulations

In order to meet these challenges, the entire rail industry must improve its Manufacturing & MRO processes and in particular develop capabilities for reliable life cycle tracking across companies, supply chains and over MRO-object life cycles of up to 50 years.

## Today’s Solutions
**How are they solving the need today?**

- The use of proprietary identification that only applies locally
- Manual exchange of information as well as manual handling of MRO processes

## Offer
**What do we offer concretely?**

GS1 system of standards to identify, capture and share information, including application standards for:

- Rail vehicle visibility
- the Identification of Components and Parts in the Rail Industry
- the exchange of component / part lifecycle data in the rail Industry
### Benefit
*What advantage does our offer (uniquely) provide?*
- Providing the foundation for safety- and operations-relevant information exchange among stakeholders leading to improved risk management
- Traceability of parts and components and overall reduction of costs by using a single rather than multiple parallel solutions
- Collaborative planning, forecasting and replenishment (CPFR) process among global stakeholders leading to reduced inventory levels and preventative maintenance
- Support in complying with rail safety regulations.

### Reason Why
*What do we do better than today’s solutions that justifies the benefit?*
GS1 global standards for identifying and marking MRO items and materials will provide:
- Open and well established GS1 standards for the supply chain and life cycle management that support the rail industry to meet this business need, while ensuring interoperability across sectors.
- A common, agreed industry standard for manufacturers to work with in relation to identifying, barcoding and tagging their material.
- A clear direction for system integrators and solution providers as to the industry’s requirements in relation to identification codes and data capture technologies.
- A basis creating the conditions for future [Industrial Internet of Things] concepts and a great opportunity for everyone involved to work together on topics of digitalization.

### Facts and Case Studies
*What compelling facts and case studies illustrate the benefits?*
- HFG and ContiTech case studies
- Video testimonials: HFG, Trafikverket & OneSteel/Pandrol
- GS1 Standards im Bahnsektor - Eindeutige Identifikation von Bauteilen und Komponenten. Broschüre (to be translated in English)
GS1 standards keep rail companies on track

Video link: https://youtu.be/pcj7Pso0sNs
GS1 Rail standards deployment (status May 2019)

Implementation needs included in tenders and contracts in AT, CH, DE, FR.

Deadline GS1 implementation = Jan. 1st, 2019

Implementation projects started

Number of named suppliers to main national railway operator (provided by operator)

Number of rail industry suppliers with manufacturing/distribution sites as per “GS1 Rail sector analysis 2018”
Use cases in Technical Industries – Rail

- **Asset Identification & Vehicle visibility (Application Standard 2015)**
  - Austria: 100 wagons (full roll-out started this year)
  - Germany: 30,000 (starting, target = all 75,000 vehicles)
  - India: 8,000 wagons (3% of estim. Total)
  - Norway: ?? (EPC tagging mandatory)
  - Sweden: 6,000 wagons from 10 operators
  - Switzerland: 100% locomotives & passenger wagons

- Identification **parts and components (Appl. Standards 2016/2017)**
  - Implementation DataMatrix / EPC-RFID in full speed in Australia and Europe
    - All state operators in Australia
    - In Europe: SBB, DB, SNCF, ÖBB, SNCB, SJ, PKP
# Railways

## Industry needs
- Vehicle visibility
- Efficient procurement processes of parts and components
- Life Cycle Traceability (MRO) across all business partners

## GS1 Focus
- (s)GTIN
- GIAI
- SSCC
- DataMatrix
- EPC/RFID
- Sensors
- EPCIS

## Standardisation needs
- Addendum to Appl. Standards “List of Do’s and Don’t’s → Done
- Issue use GTIN/GIAI in postponing procedure → Done
- DataMatrix min/max size requirements
- Sensors for TI use

## Milestones 2018-2019
- Implementation Application Standards for parts full speed ahead
  - Main drivers DB, ÖBB, SBB, SNCF (natl. railway operators in AT, CH, DE and FR).
  - Suppliers in all of Europe. ex. DB has 17,261 suppliers: Siemens (DB tier 1) has +50K suppliers
  - Implementation of Project i-Trace started in Australia (collaboration with ARA)
  - Cross-fertilisation with activity GS1 in Construction industry (BIM regulation Rail Infra)
  - SBB Infra site visit in May 2019 with Industry stakeholders (CH, DE, FR, GB, NL)
- Companies / Associations driving GS1 adoption in this industry mainly in Europe and Australia
Meeting / site visit SBB Infra May 7th

Participants (from left to right):

1. Thierry Fort – SNCF Mobilités
2. Younger Owen - Network Rail
3. Enzo Blonk – GS1 GO
4. Milé Buurmeijer - Prorail
5. Daniel Müller – GS1 CH
6. Gerald Gruber – GS1 AT
7. Holger Lüke – ProjectBIM
8. Uwe Rüdel – GS1 CH
9. Mario Moritz – ProjectBim
10. Benoit Besson – SNCF Réseau
11. Diana de Bernardy – GS1 FR
12. Philippe Kuchly – SNCF Réseau
13. Vincent Lahillade – SNCF Réseau
14. Dominik Halbeisen - SBB
15. Matthias Jorns - Bombardier
Meeting / site visit SBB Infra May 7th (cont.)
UNIFE full Member Companies (May 2019)

= actively involved in the GS1 workgroup
= currently involved in deployment of the application standards
Other suppliers implementing (non-UNIFE)

- ARSC
- Banlaw Pty Ltd
- Delachaux Group (Pandrol, Vortok,...)
- Granger Forge & Engineering
- Milspec Manufacturing
- Siemens Mobility Pty Ltd
- SKF
- Thermit Australia Pty Ltd
- Union Rubber & Engineering
- Vulcanite Pty Ltd
Railways

Industry needs

- Vehicle visibility
- Efficient procurement processes of parts and components
- Life Cycle Traceability (MRO) across all business partners

GS1 Focus

- (s)GTIN
- GIAI
- SSCC
- DataMatrix
- EPC/RFID
- Sensors
- EPCIS

Standardisation needs

- Addendum to Appl. Standards “List of Do’s and Don’t’s → Done
- Issue use GTIN/GIAI in postponing procedure → Done
- DataMatrix min/max size requirements
- Sensors for TI use

Milestones 2018-2019

- Implementation Application Standards for parts full speed ahead
  - Main drivers DB, ÖBB, SBB, SNCF (natl. railway operators in AT, CH, DE and FR).
  - Suppliers in all of Europe. ex. DB has 17,261 suppliers : Siemens (DB tier 1) has +50K suppliers
  - Implementation of Project i-Trace started in Australia (collaboration with ARA)
  - Cross-fertilisation with activity GS1 in Construction industry (BIM regulation Rail Infra)
  - SBB Infra site visit in May 2019 with Industry stakeholders (CH, DE, FR, GB, NL)
- Companies / Associations driving GS1 adoption in this industry mainly in Europe and Australia
RAIL

GS1 Standardisation Requirements
Premise:

- An individual component and/or part or its instance in the Rail Industry will be identified either using an sGTIN or a GIAI.

- These components and/or parts will be directly marked using either the GS1 DataMatrix (preferred) or the GS1 QR Code with EPC-RFID as an additional option (unless RFID is the only technical option). The marking SHOULD contain data in AIDC and HRI format and be applied using a permanent direct marking technique.

- In an assembly, composed of various items, each identified with an sGTIN or a GIAI, the identifier of one element can both identify that specific element AND the assembly.

- When doing in-the-field maintenance, the worker needs to know which of the identifiers, attached to each part of an assembly, is the one that also identifies the assembly in the database/ERP/WMS/OMS (without having to search for it by scanning all identifiers).
Issue statement (as per SBB):

- The sGTIN has an advantage which at the same time is its biggest weakness: it carries significance by having a GTIN integrated in it, which has consequences.

- At start of *production*, when you want to tag a part which will go through production, you do not necessarily know what it will look like when it has run through production, which is called *postponing procedures*.
  
  - “production” should be understood in this case as “assembly” of different already produced parts and components which have an GTIN or a GIAI.

- This is what happens in assembly procedures. The “mother board” is already there but it can end up in many different form, fit and functions at the end of the process.

- An example is the bogey: it consists of a frame, which is assembled and can, throughout production process, take different form, fits and functions, depending on which train it will be used on at the end of the process. The specification of this bogey is not known at the start of this process, hence the term postponing procedure.
<table>
<thead>
<tr>
<th>Description of option (when using EPC-RFID tags)</th>
<th>Pro</th>
<th>Contra</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 3 Make &quot;non-relevant&quot; tags visually unrecognisable, make it inconspicuous (hidden/painted over)</td>
<td>Only identifier of final module/assembly (SRU/LRU-level) will be visually triggered by the employee</td>
<td>What if another stakeholder, now or in the future, needs to read the identifiers of the parts and doesn't use RFID (but the DataMatrix instead)? Risk of RFID-reads of different elements close to each other containing a GIAI with the same GCP. Technology progress might also influence the workability of this option in the future.</td>
<td>Not an ideal solution, but practically still functional. We agree on term “inconspicuous”</td>
</tr>
<tr>
<td>Option 4 Use filter value</td>
<td>Identifier of final module/assembly could be read quickly</td>
<td>[9-44] At the present time, application of specific filter values has not yet been standardised.</td>
<td>Moist elegant solution, but industry not ready yet. Limited to RFID technology, wouldn't work for DataMatrix or QR</td>
</tr>
</tbody>
</table>
| Option 7 Apply an additional identifier (tag) including the owner's GCP. | Only read the tags with the owner GCP | - It adds a cost (the cost of the extra tag)  
- the employee will still see the other tags  
- potential risk of lack of traceability | Feasible solution and already implemented by a few team members - Benefits outweighs the cost of the extra tags |
| Option 8 Apply a black/white list for the tags to be read | This is applied in anti-theft protection. If the workshop gets the SGTINs and/or GIAIs of the objects to be maintained/overhauled, reading device can only transmit the tags of those objects on the list which need overhaul/inspection | Adds additional effort for the operator to establish and maintain the list | To be used as a stand-alone solution but could also be used in addition to option 3 |
DataMatrix, GS1 GenSpecs & Rail

- X-dimension currently used is 0.9mm, yet according to GS1 GenSpecs on DataMatrix = too big (see next slide)

- GS1 would value the feedback from the Rail group (and *in extenso* the Technical Industries sector) on their needs and any real world experience.

- There may need to be some lines in the next DPM table that speaks to "large" DPM symbols for some applications where it makes sense.

- Suggestion GS1 Switzerland:

<table>
<thead>
<tr>
<th>Symbol specified</th>
<th>X-dimension mm (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>GS1 DataMatrix</td>
<td>0.254 (0.0100&quot;)</td>
</tr>
</tbody>
</table>

What about DataMatrix on small electronic components?
### 5.9.3.7 Symbol specification table 7 - Direct part marking

**Figure 5.9.3.7-1. GS1 symbol specification table 7**

<table>
<thead>
<tr>
<th>Symbol(s) specified</th>
<th>X-dimension mm (Inches)</th>
<th>Minimum symbol height for given X mm (Inches)</th>
<th>Quiet Zone</th>
<th>Minimum quality specification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Target</td>
<td>Maximum</td>
<td>For minimum, Target and Maximum X-dimension</td>
</tr>
<tr>
<td>GS1 DataMatrix</td>
<td>0.254 (0.0100&quot;)</td>
<td>0.300 (0.0118&quot;)</td>
<td>0.615 (0.0242&quot;)</td>
<td>Height is determined by X-dimension and data that is encoded</td>
</tr>
<tr>
<td>GS1</td>
<td>0.254</td>
<td>0.300</td>
<td>0.615</td>
<td>Height is determined by X-dimension and data that is encoded</td>
</tr>
</tbody>
</table>

### 5.9.3.9 Symbol specification table 9 - GS1 keys GDTI, GRAI, GIAI and GLN

**Figure 5.9.3.9-1. GS1 symbol specification table 9**

<table>
<thead>
<tr>
<th>Symbol(s) specified</th>
<th>X-dimensions mm(inches)</th>
<th>Minimum symbol height for given X mm(inches)</th>
<th>Quiet Zone</th>
<th>Minimum quality specification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum</td>
<td>Target</td>
<td>Maximum</td>
<td>For minimum X-dimension</td>
</tr>
<tr>
<td>GS1-128</td>
<td>0.250 (0.0098&quot;)</td>
<td>0.250 (0.0098&quot;)</td>
<td>0.495 (0.0195&quot;)</td>
<td>12.70 (0.500&quot;)</td>
</tr>
<tr>
<td>GS1 DataMatrix (ECC 200) (*)</td>
<td>0.380 (0.0150&quot;)</td>
<td>0.380 (0.0150&quot;)</td>
<td>0.495 (0.0195&quot;)</td>
<td>Height is determined by X-dimension and data that is encoded</td>
</tr>
<tr>
<td>GS1-DP</td>
<td>0.380</td>
<td>0.380</td>
<td>0.495</td>
<td>Height is determined by X-dimension and data that is encoded</td>
</tr>
</tbody>
</table>
The 7 year itch...? Quite the opposite!

- GS1 Germany since 2013 focus on Technical Industries - Automotive, Mechanical Engineering, Railways, Defence, Construction and Wind Energy

- In 2019 TI @ GS1 Germany accounts for (in relation to FMCG):
  - 20% of existing membership revenue
  - 33% of new membership revenue
  - 42% of new membership revenue (if incl. cancellations)

But what were the success factors for that?

- A high level of intrinsic motivation, diligence, tenacity, curiosity about new industries, people and processes, and in-depth (process) understanding of the respective industry.
- Like a coach of a football team who has to "read" a football game, we must be able to "read" an industry and convince our (potential) customers with our GS1 standards, which takes time.
- Our approaches are diverse and, in particular, sustainable
RAIL

MO Update
Digital Transformation of Rail Industry

Discover the promise of GS1 in Rail

Diana de Bernardy – GS1 France
Lisbon, September 11th 2019
Rail conference – 17th of May
Conference topics

STRATEGIC APPROACH OF THE FRENCH RAIL SECTOR
Bruno Sol-Rolland
ALSTOM

GS1 @ SNCF
Point d’étape:
Adoption, organisation, et avancement
17/05/2019
Worshops & topics

VENDREDI 17 MAI

ATÉLIER 1 :
Comment mettre le système GS1 en place ?

ANIMÉ PAR DOMINIC HAUSER

VENDREDI 17 MAI

ATÉLIER 2 :
Déployement de la RFID dans la supply chain de Décoatie

ANIMÉ PAR Hervé D’Allulain

VENDREDI 17 MAI

ATÉLIER 3 :
Accélérer le virage numérique grâce aux standards GS1

ANIMÉ PAR DAVID DE BERNARDY & LEOIL WULUS

VENDREDI 17 MAI

ATÉLIER 4 :
Les standards GS1 au service de la “Construction 4.0”

ANIMÉ PAR ENZO BOWAN & AHEDAN DILIPAHARI

INSCRIVEZ-VOUS

SESSION 1 : 13h30

SESSION 2 : 14h15

INSCRIVEZ-VOUS

SESSION 1 : 13h30

SESSION 2 : 14h15

INSCRIVEZ-VOUS

SESSION 1 : 13h30

SESSION 2 : 14h15

INSCRIVEZ-VOUS

SESSION 1 : 13h30

SESSION 2 : 14h15
Digital projects of the rail sector

Industrialisation and deployment of "FerConnect", a digital platform for the supply chain

Unique identification and codification of parts and equipment within the industry

Digital management of document flows
Local activity

- LinkedIn GROUP
- Teleconferences – Q&A about deployment
- 1 2 1 meetings
New members since this summer

- RATP
- ALSTOM
- Faiveley Transport
- Valdunes
- Siemens
Specific requests

• Why GS1 Data Matrix and not QR Code?

• For some projects NFC would be better technology
Thank you

Diana
German flag

Thorsten Kirschner
Deutsche Bahn (DB) – Complex company structure

DB Railways
DB Netz (DB Netz)

DB Energy

DB Services
The Services Business Unit covers six different sectors: DB Fahrzeuginstandhaltung (Vehicle Maintenance), DB System (ICT), DB Services, DB Fuhrpark (Motor Vehicle Fleet) as well as DB Kommunikationstechnik (Communications) and DB Sicherheit...

DB Ariva plc.
DB Ariva responsible for all passenger transport activities outside Germany.

DB Bahn Long Distance

Staying on the rails with comprehensive technical skills
DB Systemtechnik – provider of a comprehensive range of engineering services

DB Vertrieb
DB Vertrieb GmbH is exclusively responsible for distribution and ticket sales for the passenger transport services of DB and many other transport operators. It connects rail services to some five and a half million passengers.

DB Digital Ventures GmbH
Deutsche Bahn Digital Ventures GmbH began its business activities on November 15, 2016. The company is a wholly owned subsidiary of Deutsche Bahn AG.
Deutsche Bahn (DB) – Complex company structure

DB Cargo AG
The DB Cargo Business Unit manages Deutsche Bahn’s Europe-wide rail freight business. Its network comprises 16 subsidiaries in different countries.

DB Bahn Regional
The DB Regio Regional Business Unit provides a fully comprehensive regional transport network which links conurbation and rural areas.

Other participating interests of Deutsche Bahn AG
This is where you’ll find company profiles and information on other participating interests of Deutsche Bahn AG.

DB Schenker Logistics
The DB Schenker Logistics Business Unit makes us one of the world’s leading providers of transportation and logistics services.

DB Fahrzeuginstandhaltung – a strong partner for heavy maintenance
As a full-service provider for rail vehicles, DB Fahrzeuginstandhaltung has the right solutions for vehicle fleet maintenance and revision.

DB Netze Stations
ct_DB%20Netze%20Stationsct_DB%20DB%20Stations%26Service%20AG
## Membership of Deutsche Bahn (DB)

<table>
<thead>
<tr>
<th>GLN</th>
<th>Company</th>
<th>Allocation Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 63124 00000 0</td>
<td>DB Station&amp;Service AG</td>
<td>01.02.2019</td>
</tr>
<tr>
<td>42 6018116 000 9</td>
<td>DB Energie GmbH</td>
<td>09.11.2018</td>
</tr>
<tr>
<td>40 61863 00000 8</td>
<td>DB Fernverkehr AG</td>
<td>13.03.2018</td>
</tr>
<tr>
<td>40 61862 00000 9</td>
<td>DB Regio AG</td>
<td>13.03.2018</td>
</tr>
<tr>
<td>40 61234 00000 2</td>
<td>DB Netz AG</td>
<td>06.10.2017</td>
</tr>
<tr>
<td>40 60709 00000 4</td>
<td>DB Cargo AG</td>
<td>20.06.2017</td>
</tr>
<tr>
<td>40 56017 00000 3</td>
<td>DB Netz AG</td>
<td>19.05.2014</td>
</tr>
<tr>
<td>40 55645 00000 3</td>
<td>DB Fahrzeuginstandhaltung GmbH</td>
<td>14.02.2014</td>
</tr>
<tr>
<td>40 52119 00000 2</td>
<td>Deutsche Bahn AG</td>
<td>09.03.2011</td>
</tr>
</tbody>
</table>
MaNaVe setzt auf den GS1 Rail Standard und stattet die verfolgten Materialien mit dem DataMatrix Code aus


**Materialnachverfolgung mit GS1 Rail Standard:**
- DB Fahrzeuginstandhaltung GmbH  ✓ (KonDoRR)
- DB Regio AG ✓ (KonDoRR)
- DB Fernverkehr AG ✓ (KonDoRR)
- DB Cargo AG ✓ (KonDoRR)
- **DB Netz AG ✓ (MaNaVe)**

**Codierungslosung**
- Bezogene Waren vom Hersteller: sGTIN: Company-Prefix (01), Serialnummer (21)
- selbst gefertigte/aufgearbeitete Waren: GIAl: Company-Prefix mit Serialnummer (8004)
Current status DB Cargo

>30,000 SGTIN
GTIN 4047637000016
6th Railway Forum Berlin, 01.10.2019 + 02.10.2019

DIGITAL & AUTOMATED: THE FUTURE AGENDA OF THE MOBILITY INDUSTRY

Leading conference & exhibition for the European railway industry

Save the Date:
01.10.2019 - 02.10.2019

Patrons:
Uwe Günther, CPO, Deutsche Bahn AG
Rolf Härdi, CTIO, Deutsche Bahn AG

Venue:
Estrel Convention Center, Berlin
**DB ROUND TABLE: DIGITAL SUPPLIER NETWORK (DE)**

*Moderator: Prof. Dr. Michael Eßig, Bundeswehr Universität München*

- **Uwe Günther**, CPO, Deutsche Bahn AG
- **Ralf Lüthi**, Head of Purchasing General Demands and Services, Deutsche Bahn AG
- **Dr. Torsten Latz**, Head of Rolling Stock and Spare Parts Procurement, Deutsche Bahn AG
- **Jan Grothe**, Head of Infrastructure Procurement, Deutsche Bahn AG
- **Thomas Fell**, Managing Director, GS1 Germany GmbH
- **Dr. Alexander von Lieven**, CEO, SPITZKE FAHRWEGSYSTEME GmbH
- **Stefan Orlinski**, Director of Sales & Business Development, Thales Transportation Systems GmbH
Railway Forum, Conference Day 1
Thorsten Kirschner
Senior Manager Industry Engagement
GS1 Germany GmbH
Tel.: 0221 94714-240
eMail: thorsten.kirschner@gs1.de
Discover the promise of GS1 in Rail

11. September 2019

Uwe Rüdel
Digital Transformation of Rail Industry

Discover the promise of GS1 in Rail

Dr. Uwe Ruedel, GS1 Switzerland
11. September 2019
Activities

**National**

- 7th May 2019: Visit of SBB Facilities in Bern – 15 Attendees from 4 companies
- Lecturing at ABB Technikerschule: „e-Solutions für Industrie 4.0“ - active support from D. Halbeisen (SBB) on 25. June 19, visit to another SBB site

Coming up:

- National Workshop with operator and suppliers on 17. Sept 2019 in Bern @ GS1 Switzerland

**International**

- 1st D-A-CH Workshop with 3 Railway operators and 15 suppliers from Germany, Austria and Switzerland on 19. Nov 2019 in Bern @ GS1 Switzerland.
Visit SBB, Bern 7. May-2019
Umsetzung des GS1 Systems bei SBB Infrastruktur

Dominik Halbeisen
SBB/CFF/FFS
Senior Projektleiter
Supply Chain Management
Unser Aktionsplan… vor 3 Jahren

Zu Beginn Fokus auf Rollmaterial
Schritt 1 – Die richtige Norm finden
Unser Aktionsplan... vor 3 Jahren

Zu Beginn Fokus auf Rollmaterial

Gem. Kennzeichnungsstandard

harmonisation of numbering schemes

trading & tracing
across companies and borders
Schritt 2 - Die Kennzeichnung standardisieren

Identification of Components and Parts in the Rail Industry - Application Standard

Rules on the use of the GS1 keys and attributes for the identification and marking of components and parts in the rail industry

Release 1.1, Ratified, Sep 2019
Zu Beginn Fokus auf Rollmaterial

...auch zum Datenaustausch

Unser Aktionsplan... vor 3 Jahren

Gem. Kennzeichnungsstandard
Schritt 3 – Datenaustausch aufbauen

<?xml version="1.0" encoding="UTF-8"?>
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
  <soapenv:Body>
      <queryName>SimpleEventQuery</queryName>
      <resultsBody>
        <EventList>
          <ObjectEvent>
            <eventTime>2019-05-03T16:28:24.000+02:00</eventTime>
            <recordTime>2019-05-03T16:28:25.000+02:00</recordTime>
            <eventTimeZoneOffset>+02:00</eventTimeZoneOffset>
            <baseExtension>
              <eventID>urn:uuid:d90a9f04-d42a-4e24-bd34-d524eb75df7b</eventID>
            </baseExtension>
            <epcList>
              <epc>urn:epc:id:sgtn:4054364.058507.1811271531850712</epc>
            </epcList>
            <action>OBSEVE</action>
            <bizStep>urn:opcglobal:cbv:bizstep:inspecting</bizStep>
            <disposition>urn:opcglobal:cbv:disp:damaged</disposition>
          </ObjectEvent>
          <ObjectEvent>
            <eventTime>2019-05-03T16:28:24.000+02:00</eventTime>
            <recordTime>2019-05-03T16:28:25.000+02:00</recordTime>
            <eventTimeZoneOffset>+02:00</eventTimeZoneOffset>
            <baseExtension>
              <eventID>urn:uuid:d90a9f04-d42a-4e24-bd34-d524eb75df7b</eventID>
            </baseExtension>
            <epcList>
              <epc>urn:epc:id:sgtn:4054364.058507.1811271531850712</epc>
            </epcList>
            <action>OBSEVE</action>
            <bizStep>urn:opcglobal:cbv:bizstep:inspecting</bizStep>
            <disposition>urn:opcglobal:cbv:disp:damaged</disposition>
          </ObjectEvent>
        </EventList>
      </resultsBody>
    </ns5:QueryResults>
  </soapenv:Body>
</soapenv:Envelope>
Zu Beginn Fokus auf Rollmaterial

Gem. Kennzeichnungsstandard

Ein Beispiel aus der Infrastruktur

Unser Aktionsplan... vor 3 Jahren

...auch zum Datenaustausch
Lassen Sie uns auf eine Reise gehen

Blickwinkel: Life Cycle Manager für Weichen

Sie erhalten zwei Fotos der Instandhaltung

„Unüblicher Verschleiss“

Nächste Schritte?

Einer 1/2 Zungenvorrichtung und einer Schweissung
Schritt 1 – Historie auf Basis GS1 Schlüssel

Ausgehende von den GIAI (= GS1 S/N) beginnt die Suche.

Nach 15 Minuten ist die ganze Historie…

...der ½ Zungen-vorrichtung, bekannt
Schritt 1.1 – Historie innerhalb der SBB

- Auslieferung
- WE nach Fertigung
- Fertigungsauftrag
- WA in die Fertigung
- WE Rohmaterial
- Bestellung
Schritt 1.2 – Historie ausserhalb der SBB

Übersicht Supply Chain

Tier 1
(Herstellung/Walzung von Schienen)

Tier 2
(Stahlherstellung)

Tier 3
(Rohstoffgewinnung/-erzeugung)

Eisenerz
Koks
Kohle
Stahlschrott

Hersteller Rohzunge
Lieferant Schiene
Stahllieferant
Rohstoff-Lieferanten
### Schritt 1.3 – Eingrenzung der potentiell betroffenen Teile

<table>
<thead>
<tr>
<th>Equipment</th>
<th>GIAI 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>70008738</td>
<td>80049010381300000067</td>
</tr>
<tr>
<td>70008739</td>
<td>80049010381300000068</td>
</tr>
<tr>
<td>70008740</td>
<td>80049010381300000069</td>
</tr>
<tr>
<td>70008741</td>
<td>80049010381300000070</td>
</tr>
<tr>
<td>70008742</td>
<td>80049010381300000071</td>
</tr>
<tr>
<td>70008748</td>
<td>80049010381300000062</td>
</tr>
<tr>
<td>70008749</td>
<td>80049010381300000063</td>
</tr>
<tr>
<td>70008750</td>
<td>80049010381300000064</td>
</tr>
<tr>
<td>70008751</td>
<td>80049010381300000065</td>
</tr>
</tbody>
</table>

9 x Zungenrohlinge im selben Lieferlos
Schritt 1.4 – Historie der Schweissarbeiten

Ein Beispiel

Fahrweg des Teams

Charge der Schweisspackung

Arbeitsbericht
Schritt 1.5 – Vom Instandhaltungsteam genutzte Werkzeuge

Identifiziert via GIAlS

Inkl. Transferhistorie
Nächste Schritte auf Basis der Historie

Sie entscheiden ein Meeting abzuhalten… und suchen einen Fokusraum

Hierfür scannen Sie einfach die GIAI am nächsten Fokusraum...

...und bemerken zugleich die GIAI am Belegtsensor
Und setzen sich auf ebenfalls verfolgtes Mobiliar...
Resultat: Ein Teil in der Fläche muss inspiziert werden

Die GIAI ist bekannt

...und somit der Lagerort
Unterwegs… weitere GIAl-Applikationen: Infrastruktur
Unterwegs…weitere GIAl-Applikationen: Brandschutz
Unterwegs... weitere GfAI-Applikationen: Anlagen
Zusammenfassend - wo stehen wir?

Die in den letzten Jahren entwickelten GS1 Standards werden kontinuierlich umgesetzt.

- GS1 Anlagen-identifikation ist verbreitet
- Anlagendaten werden erhoben
- Zukunft: Datenaustausch zu Sensorik
- Next: Datenaustausch zu Events
Für weitere Informationen:

www.gs1.org/rail
Vielen Dank

Dominik Halbeisen
SBB/CFF/FFS
Senior Projektleiter
Supply Chain Management

dominik.halbeisen@sbb.ch
Prozessbeispiel: Bestellprozess Radsatzwellen

**Bis Ende 2018**

**Einkauf:**
Bestellung für Wellen anlegen

**E-Mail an Katalogdienst**

**Generierung von SBB Serial-Nr.**

**Antwort-Email mit SBB Ser.Nr. an Einkauf**

**Copy-Paste der Ser.Nr. in die Bestellung**

**Obsolet**

**Obsolet**

**Obsolet**

**Obsolet**

**Obsolet**

**Seit 2019**

**Lieferant erhält Bestellung**

**Lieferant legt Auftrag im ERP an**

**Lieferant legt Fertigungsauftrag an**

**Lieferant legt seine Ser.Nr. an**

**Lieferant legt Ser.Datei mit GIAI an**

**Verheiratet SBB Ser.Nr. zu seiner Lieferanten Ser.Nr.**

**Obsolet**

**Lieferant erstellt Q-Papiere mit seiner Ser.Nr.**

**Wellen an SBB verschickt und empfangen**

**Wareneingangs-Prüfung bei den SBB**

**Abgleich der Q-Papiere (Lief.Ser. Nr.) vs. SBBSer.Nr.**

**Freigabe Wellen in verfügbaren Bestand**

**Obsolet**

**Q-Papiere verknüpft mit GIAI**
Prozessbeispiel: Bestellprozess Radsatzwellen

Einkauf:
Bestellung für Wellen anlegen

Since 2019

Lieferant erhält Bestellung

Lieferant legt Auftrag im ERP an

Lieferant legt Fertigungsauftrag an

Wellen an SBB verschickt und empfangen

Wareneingangs-Prüfung bei den SBB

Freigabe Wellen in verfügbaren Bestand
Prozessbeispiel: Aufarbeitung Radsatzwellen

Bis Ende 2018
- Radsatz kommt in die Aufarbeitung

Seit 2019
- Befund: Radsatz muss ersetzt werden
- Mitarbeiter kommissioniert neue Welle
- Schreibt die Ser.Nr. ab
- Lös’t Barcode-Label ab
- Schreibt Ser.Nr. in Email ab
- Schreibt Mat.Nr. in Email ab
- Schickt Email an AVOR
- AVOR leitet Email weiter an Katalogdienst
- Scannt Ser.Nr. (GIAI) und Mat.Nr.
- Obsolet
- Eröffnung eines Equipments (EQ) im SAP
- Copy-paste der Ser.Nr. und der Mat.-Nr. ins EQ
- Antwort-Email mit EQ-Nr. an AVOR
- AVOR leitet Email an Produktion weiter

Bis Ende 2018
- Obsolet

Ende 2018
Prozessbeispiel: Aufarbeitung Radsatzwellen

Bis Ende 2018
- Radsatz kommt in die Aufarbeitung
- Befund: Radsatz muss ersetzt werden
- Mitarbeiter kommissioniert neue Welle
- Lösst Barcode-Label ab

Seit 2019
- Schickt Email an AVOR
- AVOR leitet Email weiter an Katalogdienst
- Antworten-Email mit EQ Nr. an AVOR
- AVOR leitet Email an Produktion weiter
- Produktion sucht SAP EQ. Vervollständigt Daten

Ziel für 2019/2020
- Eröffnung eines Equipments (EQ) im SAP
- Copy-paste der Ser.Nr. und der Mat.-Nr. ins EQ
- Eröffnung SAP EQ bei Versand auf Basis EPCIS Datei
RAIL

Looking ahead....events

Four areas of Focus:
• Digital Transformation
• International Markets
• New Technologies
• Automation

Contributions from:
Alstom, AWS, Bombardier, Cisco, CRRC, Cyient, DB, DuisPort Agency, EBK, EOS, Harting, HP, Kathrein Solutions, Konux, LAT Gruppe, Metro Kopenhagen, PESA, Plasser & Theurer, Qlik, SBB, Schaeffler, Siemens, SKF, Spitzke, Stratasys GmbH, SupplyOn, Talgo, Thales, TÜV Rheinland, VBB, VDE, Voestalpine, ZVEI.

Link to Programme in PDF.
• **Madrid** / Spain
• **March 31st – April 2nd** 2020
• Innovation in the Rail Industry
• GS1 to present
• Offer to hold a roundtable workshop (45 mins)
  • April 1st – 11:30 to 12:15
  • All participants from national operators and infrastructure managers will be **invited for free** to the entire show as VIP guests on behalf of GS1. They also have access to our networking drinks on 1st April at the Spanish Railway Museum.
• Proposals for presentations in plenaries or workgroups are welcome.
Confirmed Speakers

• Andrew Haines, CEO, **Network Rail**
• Mark Thurston, CEO, HS2
• Johnny Shute, COO, Railway Safety and Standards Board (RSSB)
• Martin Frobisher, Group Engineering Director, **Network Rail**
• President, Renfe
• President, ADIF
• Bashar Al Malik, CEO, SAR
• Elisabeth Werner, Director Land Transport, DG MOVE, EU Commission
• Patrick Jeantet, CEO, **SNCF Rseau**
• Dr Jacob Kam, CEO, MTR Corp
• Jie Xin, CEO and Chairman, Shenzhen Metro
• Bernard Cathelain, Board Director, Société de Grand Paris
• Leslie Woo, Chief Development Officer, Metrolinx Toronto
• Taeho Kim, CEO, Seoul Metro
• Torkel Patterson, Board Member, JR Central
• Kim Sang Gyun, CEO, Korea Rail Network Authority
• Corey Hannett, Director-General, **Major Transport Infrastructure Authority of Victoria**
• Lena Erixon, Director-General, Trafikverket
• Tim Keith, President, Texas Central
• Dr. Carsten Wiebers, Global Head Aviation, Mobility & Transport, KfW IPEX-Bank
Who to contact

Enzo Blonk
Director Industry Engagement – Technical Industries

T +32 2 788 78 00
D +32 2 788 78 607
M +32 473 89 89 8
e enzo.blonk@gs1.org
w www.gs1.org