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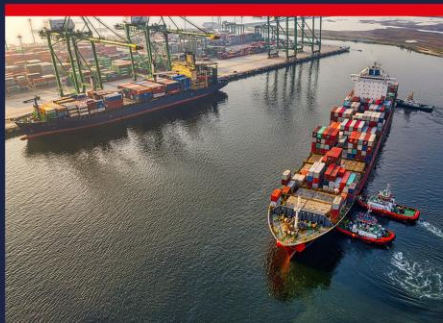
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Smart Container update

Michael Schröder / Ann-Christin Fröhmcke



What's a Smart Container?



Smart containers in this context are dry or reefer containers with an IoT device (referred to by the IMO as 'data loggers and tracking devices') permanently fixed to the outside of the container.

In case of reefer containers, the IoT device is powered by the reefer engine.

In case of dry container, it typically contains batteries.

The IoT device can transmit the GPS position of the container, plus more data read from sensors, to a dedicated gateway in a cloud.

A container with IoT device is considered "smart" irrespective whether it is empty or loaded with cargo.



How to identify a smart container?



	Motivators
1.	To be ascertained IoT devices are compliant with safety regulations and not considered a source of ignition.
2.	To identify a smart container when ordering one from a depot
3.	To prevent devices from being removed by authorities. "proof" that it was added by the right party. Theoretically validate the tag nr with the container nr.
4.	To inform crew on board which loaded reefers are smart.
5.	To identify smart containers in the vessel stowage plan (BAPLIE)
6.	To provide services to clients and therefore accounting purposes
7.	To allow third parties (shippers, container operators) to transfer this information to the carrier

IoT Safety Regulations Status 2023



For dry cargo containers with IoT device attached

5.5.4 Dangerous goods in equipment in use or intended for use during transport.

5.5.4.1 Dangerous goods (e.g. lithium batteries, fuel cell cartridges) contained in equipment such as data loggers and cargo tracking devices, attached to or placed in packages, overpacks, containers or load compartments are not subject to any provisions of this Code other than **7.3.5** and the following:

- .1 the equipment shall be in use or intended for use during transport;
- .2 the contained dangerous goods (e.g. lithium batteries, fuel cell cartridges) shall meet the applicable construction and test requirements specified in this Code; and
- .3 the equipment shall be capable of withstanding the shocks and loadings normally encountered during transport and shall be safe for use in the dangerous environments to which it may be exposed.

5.5.4.2 When such equipment containing dangerous goods is transported as a consignment, the relevant entry of the Dangerous Goods List in **chapter 3.2** shall be used and all applicable provisions of this Code shall apply.

7.3.5 Tracking and monitoring equipment

When security devices, beacons or other tracking or monitoring equipment are used, they shall be securely installed to the cargo transport unit and shall be of a certified safe type³ for the dangerous goods that will be carried within the cargo transport unit.

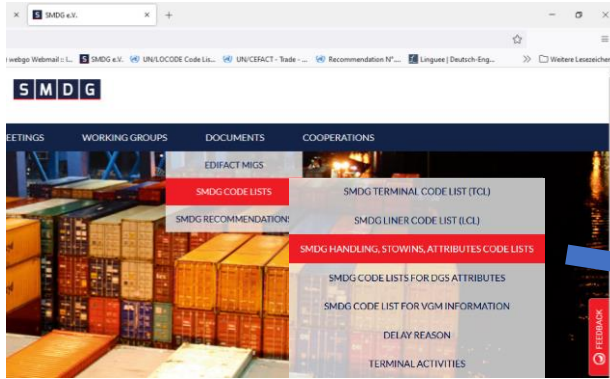
[3] Refer to the Recommendations published by the International Electrotechnical Commission, in particular, to publication IEC 60079.

This paragraph 5.5.4 was new in IMDG Code Amendment #40. It reads that Lithium Batteries in tracking devices are not subject to the IMDG Code except § 7.3.5 see below

§ 7.3.5 reads that tracking devices must be securely installed and must be of a certified safe type

Bottom line: The batteries in the IoT device are not regulated by the IMDG code. Whether or not an IoT device can be seen as source of ignition, or which certificate is required to prevent that, is still not defined.

SMDG provides standard codes for smart container identification in EDI messages

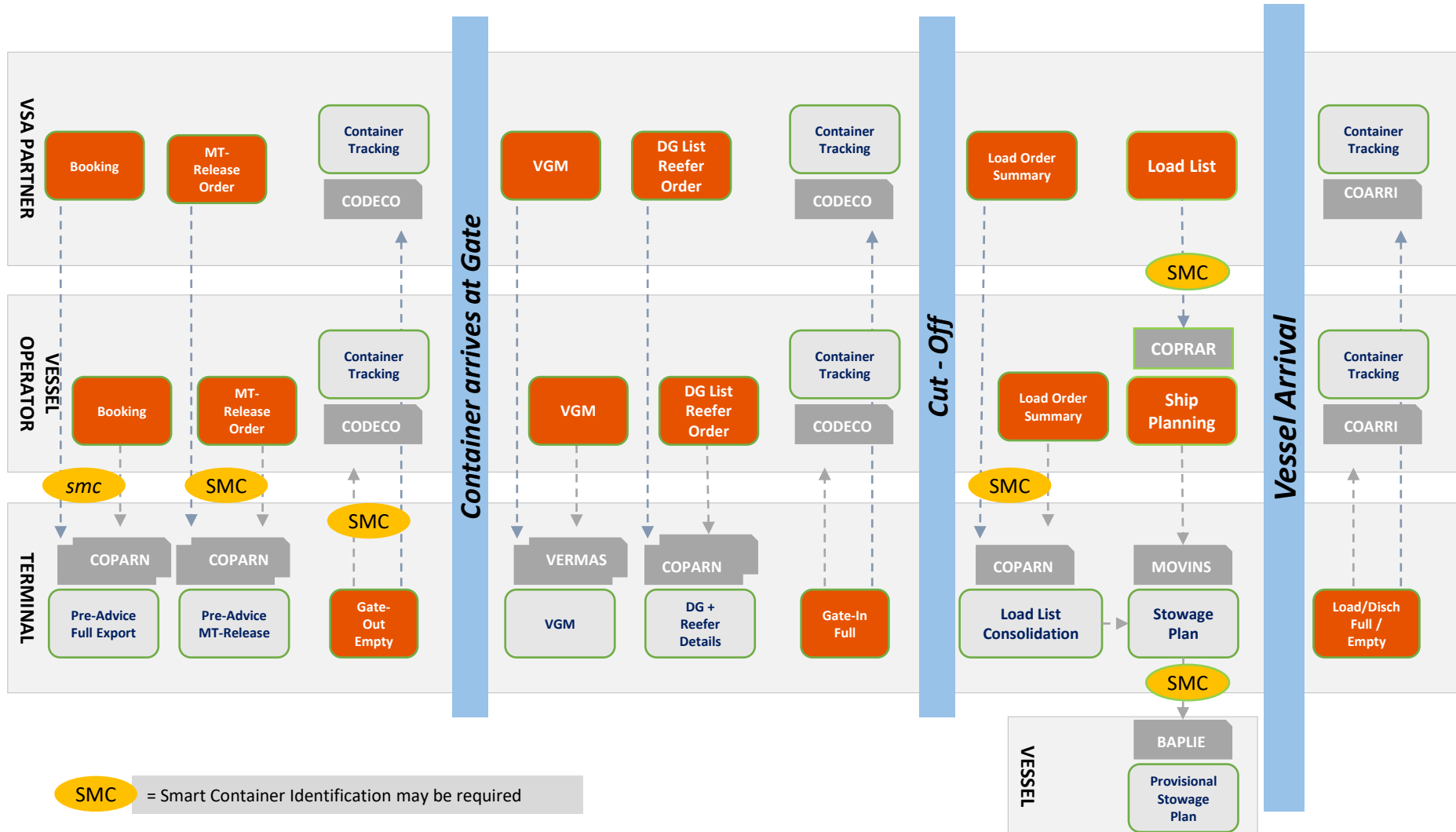


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	SMDG Attribute code list
Definition:	These codes define properties or status of a transport equipment on a specific means of transport. For some attribute codes an additional stowage instruction might be applied.
DE 1131= ATTRIBUTES	Examples: ATT+27++SMC:ATTRIBUTES:306' (if ATT segment is available) FTX+ACF++SMC:ATTRIBUTES:306' (D.00B and later) FTX+ACF++SMC:ATT:306' (before D.00B)

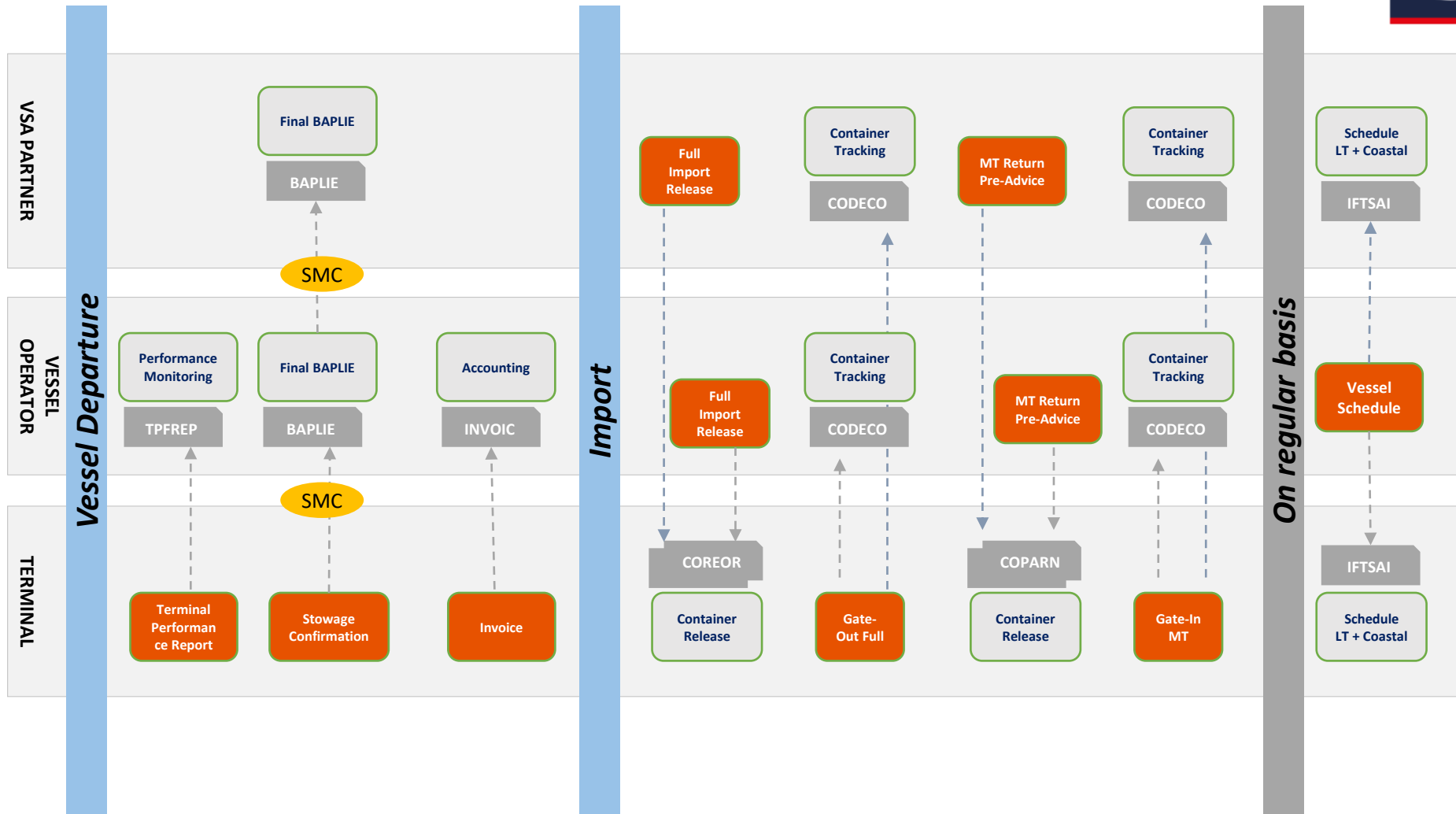
Download the code list from www.smdg.org

Code	Name	Category	Description	last change
SMC	Smart Container	PROPERTY	Smart Container	
SMP	Container with passive tag	PROPERTY	Container equipped with an passive tag (e.g. RFID) enabling automatic registration	2020-07-03
SQ	Stuffed on quay	STATUS	Equipment stuffed on quay	
STC	Steam cleaned	STATUS	Steam cleaned	
SVY	Surveyed	STATUS	Surveyed	
TCR	Timber control treatment performed	STATUS	Timber control treatment performed	
UCI	Prepared for UCIRC Standard	STATUS	Prepared for UCIRC Standard, UCIRC: Unified Container Inspection & Repair Criteria	
UQ	Unstuffed on quay	STATUS	Equipment unstuffed on quay	
V3Q	Vents three quarters open	STATUS	Vents three quarters open	
VCL	Vents closed	STATUS	Vents closed	
VFO	Vents fully open	STATUS	Vents fully open	
VHO	Vents half open	STATUS	Vents half open	
VQU	Vents one quarter open	STATUS	Vents one quarter open	
WIN	Wine	STATUS	Contains Wine	2022-12-16

Possible Smart Container Identification in Carrier /Terminal EDI 1/2



Possible Smart Container Identification in Carrier /Terminal EDI 1/2



Smart Container Identification

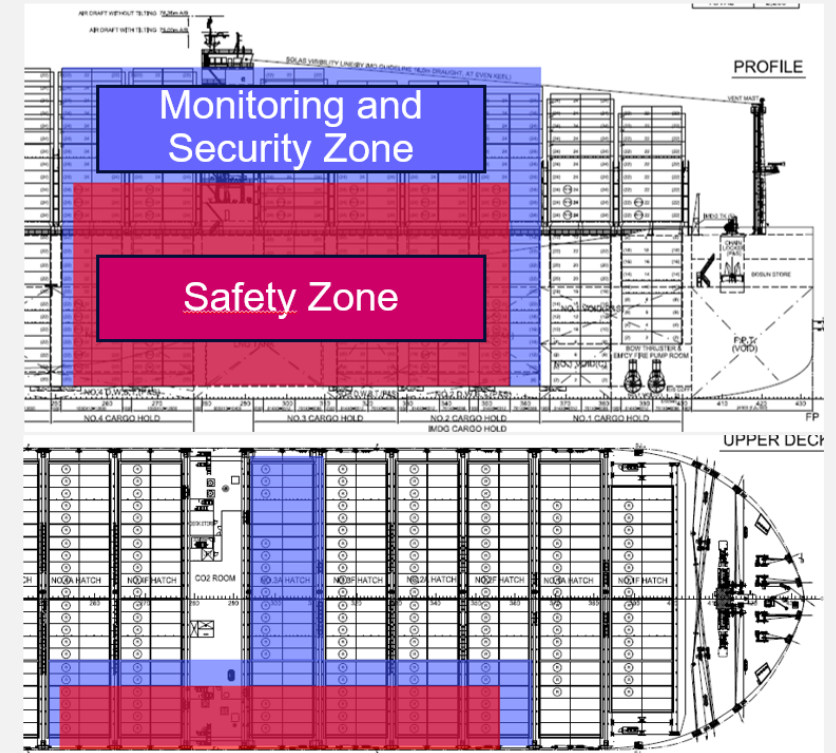


- Where are we coming from.....
- SMC and stowage constraints during SIMOPS on LNG vessels
- SMC must be identified

Challenges:

- Semi-manual process to identify SMC
- No container number = no identification
- Identify, flag partner SMC, SOC
- Last minute empty repo..
- Distinguish “certified” and “not certified”

- No reefers powered during LNG bunkering
- No dangerous cargo in the area during LNG bunkering
- No smart containers during LNG bunkering



Illustrative: vessel xyz restricted areas

*Smart containers (SMC): container equipped with IOT device outside the container

Smart Container Identification



Safety zone - The safety zone is a zone around the bunkering facility, the bunkering station of the receiving ship and the LNG transfer system. The purpose of the zone is to set an area that is put in place during LNG bunkering and within which only essential authorised and qualified personnel are allowed and potential ignition sources are controlled.

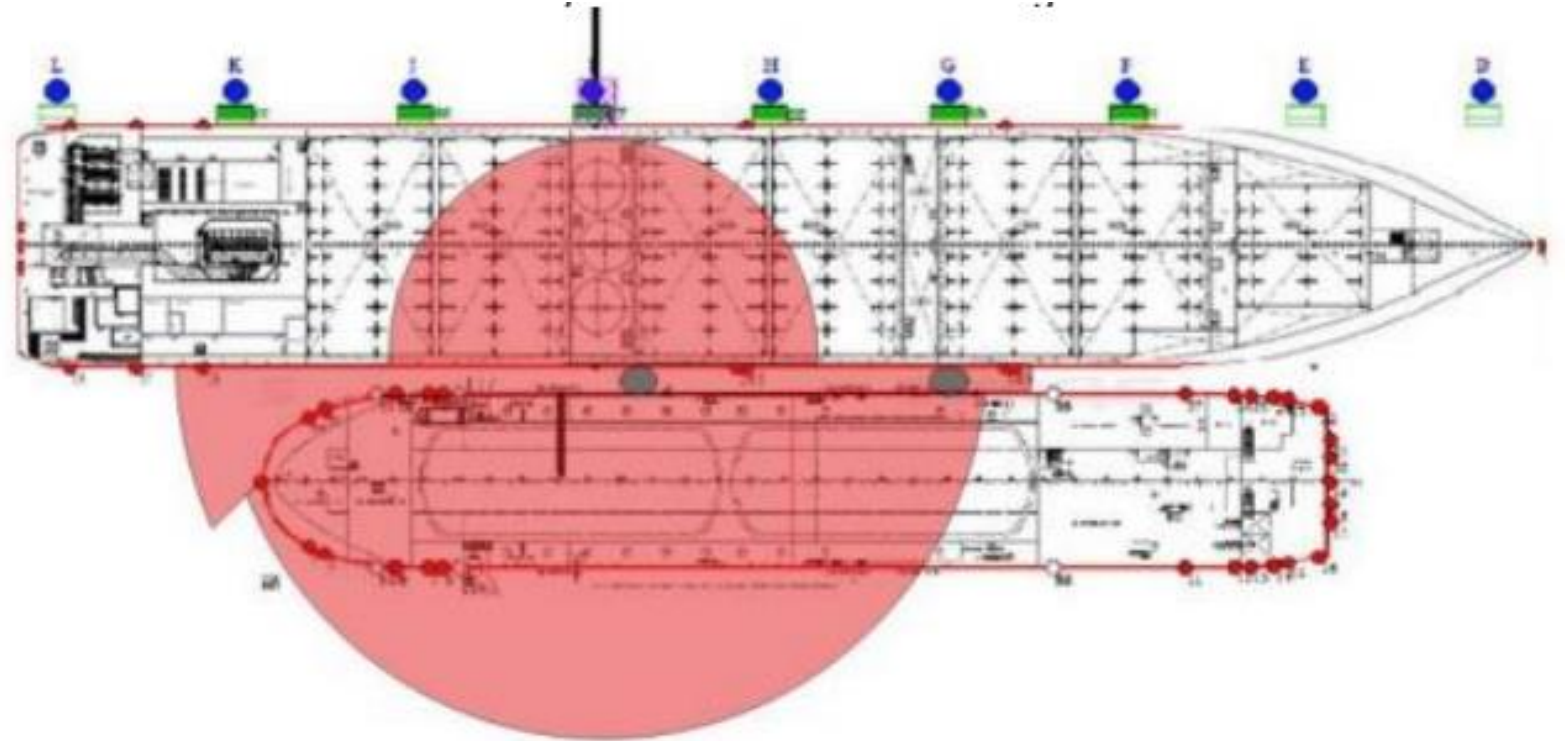


Figure 1. Horizontal Safety Zone



Thank You

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SMDG e.V.

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