



Effective **C**ontainer Inspection at  
**BORD**er Control Points

## C-BORD Final Public Workshop

9<sup>th</sup> October  
2018

Rotterdam  
NL

# **RAPIDLY RELOCATABLE CHECKPOINT FOR PORTS – INTEGRATION AND FIELD TRIALS**

WP 10

Lukasz  
Swiderski  
NCBJ

# CONTENT

TEST SITE AT DCT GDANSK

FIELD TESTS ORGANIZATION

FIELD TESTS SUMMARY



# DEEPWATER CONTAINER TERMINAL GDANSK

- DCT Gdansk – the biggest container terminal at Baltic Sea:
  - direct ocean vessel calls from/to Far East seaports
  - annual capacity 3 mln TEU
  - 1300 m of quay length
  - 8200 m<sup>2</sup> of warehouse area



photo by aeromedia.pl





# WP10 FIELD TESTS – DCT GDANSK

- WP trials preparation
  - test area and safety zone
  - mock-up truck
  - storage containers
  - bungalows
  - power
  - WiFi connection
  - safety trainings
- C-BORD equipment deployment

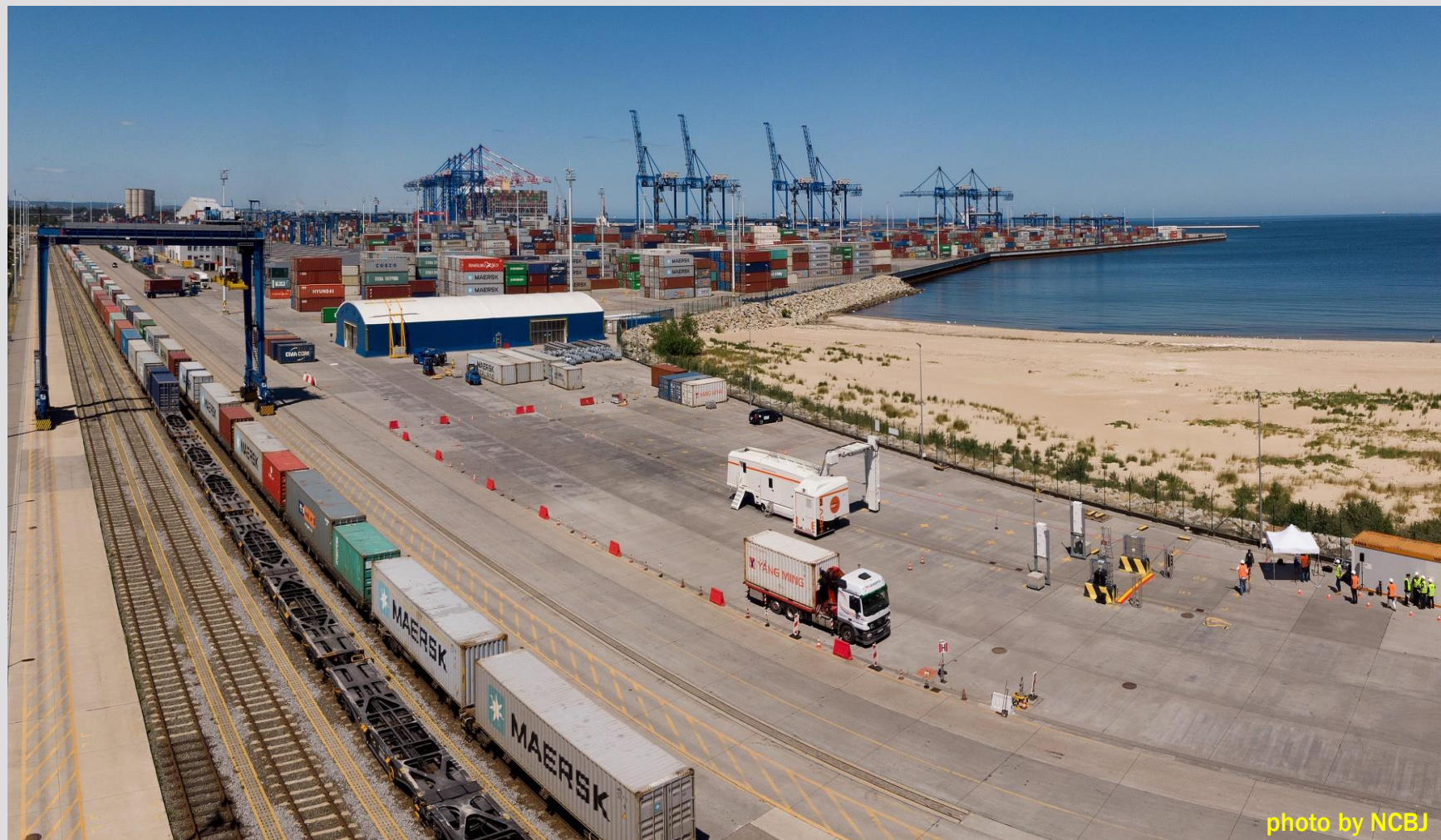
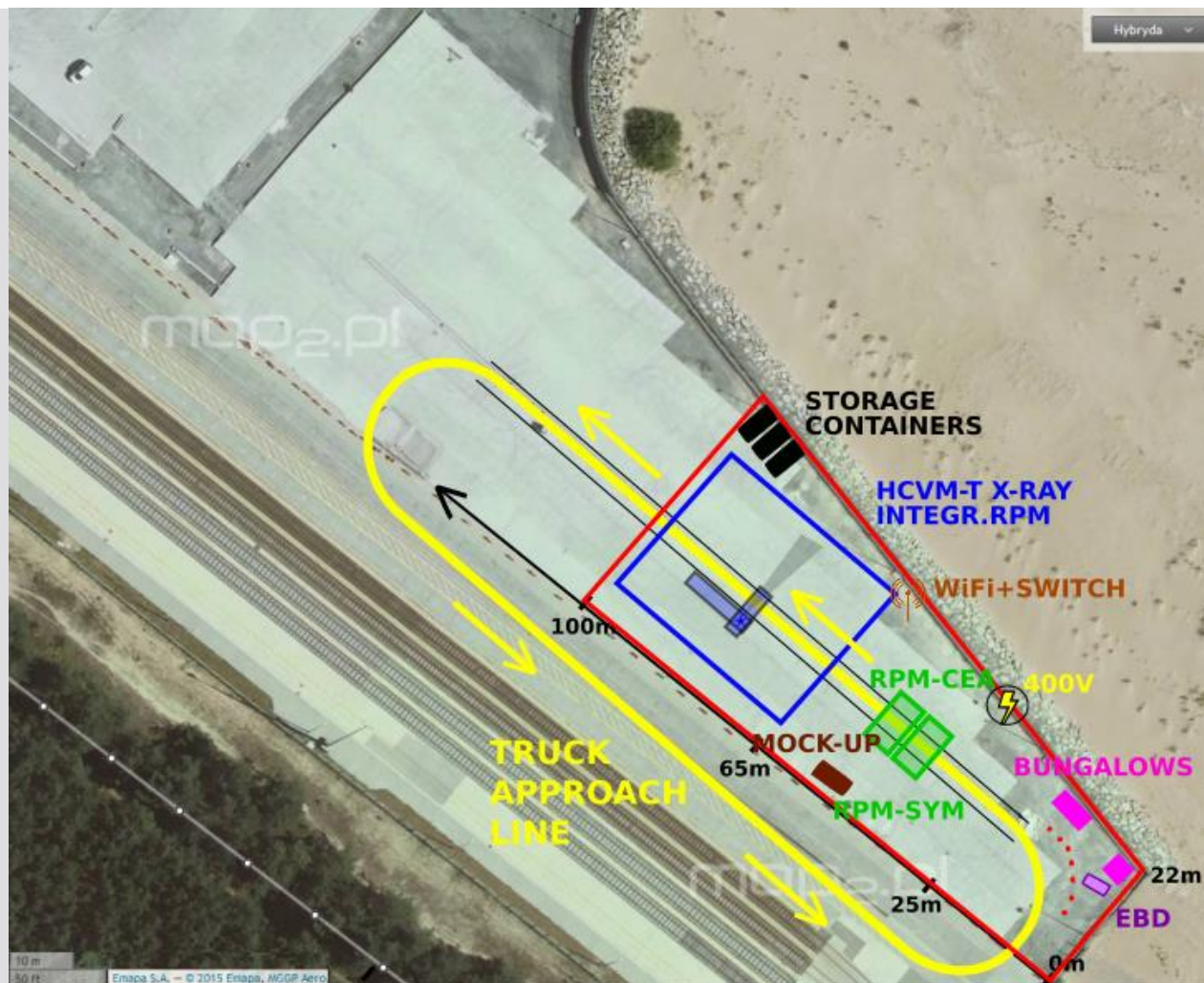


photo by NCBJ



# WP10 FIELD TESTS ORGANIZATION



## ■ C-BORD equipment tested at DCT Gdansk:

- EBD (Evaporation Based Detection)
- 2x RPMs (Radiation Portal Monitors)
- HCVM-T (X-RAY scanner)
- 2x integrated RPMs (on HCVM-T trailer)











# WP10 FIELD TESTS ORGANIZATION

- Test date: 11-29.June.2018
- Partners involved:
  - ICGdy (Revenue Administration Regional Office in Gdansk) – end-user, host
  - NCBJ – WP10 trials coordinator
  - BRSU, UNIMAN, ESIEE – EBD
  - SYM – RPM
  - CEA – RPM
  - SmithsD – HCVM-T
  - FHG-INT – Technology assessment (including also end-user feedback)
  - ARTTIC – Dissemination event coordinator

## ■ Field Validation Protocol

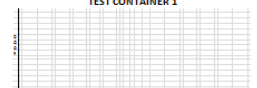
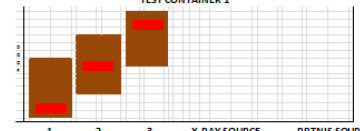
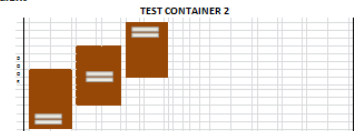
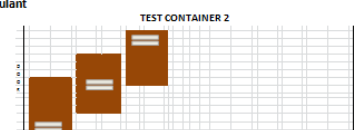
### Annex 1

C-BORD test in Gdańsk PLAN				
Duration	14 working days – March/April 2018 (8:00-16:00)			
Number of mock up containers to be tested	40 (4 tests per day)			
Number of commercial containers to be tested without RRTNIS	20 (2 tests per day) commercial containers will be chosen by Customs Risk Analysis Department. In case of alarms every container will be physically checked on the next day			
Legal cargo to be used:	11 euro pallets loaded with cargo (A-K)*			
	pallet	cargo	remarks	
	A	used car engine	1 item	
	B	steel drums with scrap metal	different types of metals	
	C	tires		
	D	water in plastic bins		
	E	empty jars		
	F	canned food		
	G	wooden slabs		
	H	paper towels		
	I	charcoal in bags		
	J	bulk cargo NORM	fertilizers, potassium salt, kitty litter, zircon sand	
	K	sett		
Simulants of threats to be used	threat	description*		
	drugs	30 packets a' 1 kg RRTNIS/X-RAY		
	explosives	30 packets a' 1 kg RRTNIS/X-RAY		
	radioactive sources	isotope	Activity on 2018-04-01 (kBq)	ANSI standard activity (kBq)
		Am-241	2x900; 18400	1739
		Ba-133	900	333
		Cs-137	356+235	592
		Cs-137	3x900	3145
		Co-60	139+110	258
		Cf-252	2.2x10 <sup>4</sup> n/s	2.0x10 <sup>4</sup> n/s
		Mn-54	900	500
	threat	description		
	cigarettes	300.000 pieces		
guns	pistol (1 item), shotgun (1 item)			
drugs	capsulated small amount (BRSU)			
explosives	capsulated small amount (BRSU)			
graphical visualization of test table (containers presented in the top-view)				
single euro pallet with cargo loaded along the container		Single euro pallet loaded across the container		
box of cigarettes		packages of drug simulant		
capsuled explosives		capsuled drug		
radioactive source		gun		

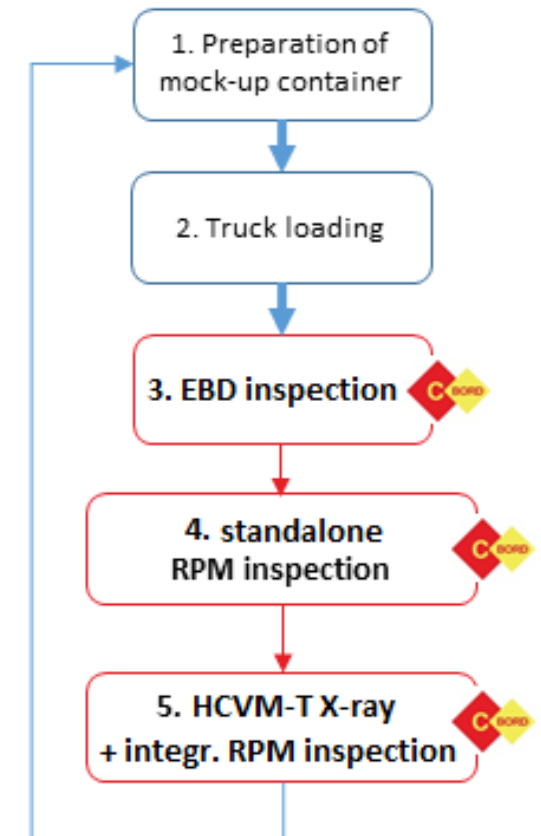
\* modification of the list is possible

PRIORITY TESTS INDICATED WITH RED COLOR (mock-up no.)

## ■ List of priority tests

TEST SCHEDULE (DAY BY DAY)	
TEST NUMBER	DAY 1 reference tests of technologies
mock-up 1	reference examination of empty container TEST CONTAINER 1  X-RAY SOURCE task to fulfil: EBD: expected negative result; RPM: no radiation detected; X-RAY: no objects inside container; RRTNIS: background measurement.
mock-up 2	reference examination of 20' container loaded on low level in 3 positions with cigarettes TEST CONTAINER 1  X-RAY SOURCE RRTNIS SOURCE task to fulfil: EBD: to detect tobacco RPM: to detect ionizing radiation spectrum typical for tobacco; X-RAY: to identify individual objects, to determine coordinates of cigarettes in all 3 positions; RRTNIS: to identify tobacco product (position 1).
mock-up 3	reference examination of 20' container loaded on middle level in 3 positions with packets of drug simulant TEST CONTAINER 2  X-RAY SOURCE RRTNIS SOURCE task to fulfil: EBD: not applicable; RPM: no radiation detected; X-RAY: to identify individual objects, to determine coordinates of packets in all 3 positions; RRTNIS: to identify drugs (position 1).
mock-up 4	reference examination of 20' container loaded on middle level in 3 positions with packets of drug simulant TEST CONTAINER 2  X-RAY SOURCE RRTNIS SOURCE task to fulfil: EBD: not applicable; RPM: no radiation detected; X-RAY: to identify individual objects, to determine coordinates of packets in all 3 positions; RRTNIS: to identify drugs (position 2).
commercial 1	single cargo ( no RRTNIS )
commercial 2	single cargo ( no RRTNIS )

## ■ Inspection cycle



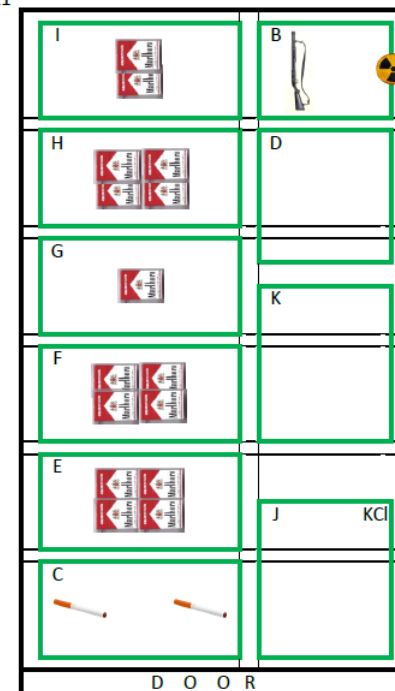


# WP10 FIELD TESTS ORGANIZATION

## ■ Mock-up preparation



M- U 11



- |   |                              |   |                       |
|---|------------------------------|---|-----------------------|
| A | used car engine              | H | paper towels          |
| B | steel drums with scrap metal | I | charcoal in bags      |
| C | tires                        | J | bulk cargo NORM       |
| D | water in plastic bottles     | K | paving stones         |
| E | empty jars                   |   | 10 kcps of cigarettes |
| F | canned food                  |   | .1 kcps of cigarettes |
| G | wood                         |   |                       |



# WP10 FIELD TESTS ORGANIZATION

## ■ Truck approach line



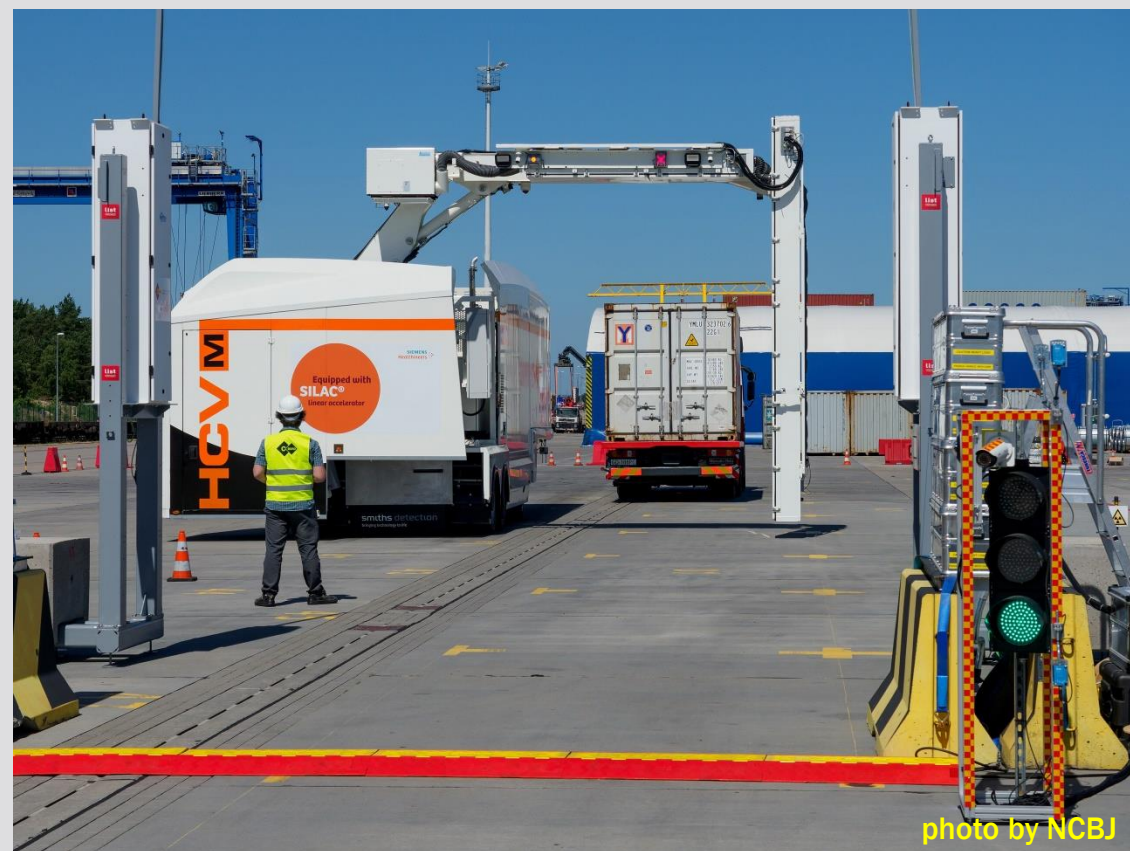


# WP10 FIELD TESTS ORGANIZATION

## ■ Evaporation Based Detection



## ■ RPMs and X-RAY scanner



# WP10 FIELD TESTS SUMMARY

- **Deployment:** 5 days
- **Tests:** 13 days
- **Scans:** 57 inspection cycles (44 full cycles)
  - EBD 53 scans + 9 ref. samples (~5-10 min/scan)
  - RPMs (x2) 65 scans + 96 rounds (~5-15 s/scan)
  - int. RPMs (x2) 68 scans + 25 rounds (~1-2 min/scan)
  - HCVM-T 67 scans + 21 rounds (~1-2 min/scan)
  - VAN system
- **Dissemination:** 2 TV reports & interviews recorded







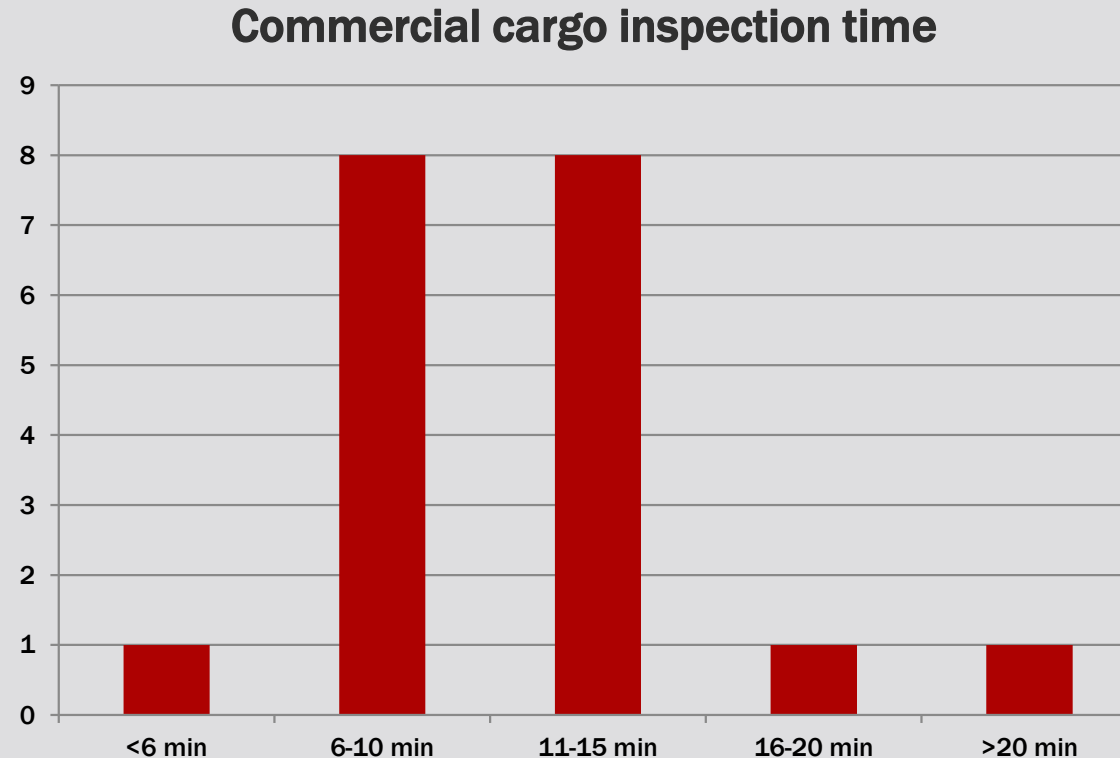
# WP10 FIELD TESTS SUMMARY

- All tests planned in the Field Validation Protocol with mock-up and commercial cargo were performed.
- Additional data was collected for modified mock-ups and during repeated runs. In total:
  - EBD            87% of 53 scans successful
  - RPMs        >98% of 93 scans successful
  - HCVM-T     90% of 98 scans successful



# WP10 FIELD TESTS SUMMARY

- Almost all inspection cycles done with commercial cargo realized **between 6 and 15 minutes**





# THANK YOU



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 653323. This text reflects only the author's views and the Commission is not liable for any use that may be made of the information contained therein.

