

# DAC Test Train in Poland 2022

DAC4EU Frankfurt 30.11.2022



## DAC Test Train by the DAC4EU Consortium at PKP CARGO Tests in Poland:

Tests 10th -20th July 2022

1. Poznań-Franowo – marshalling yard
2. Cement plant Lafarge in Bielawy/ near Inowroclaw.
3. Coking plant JSW in Dąbrowa Górnicza.
4. Zabrzeg Czarnolesie – marshalling yard



# Test Train Composition

## VOITH



377-1      281-8      940-6      520-2      306-3      570-7



376-3      787-7      278-4      018-6      791-5      261-0

- # Voith
- # Dellner
- UIC screw coupler
- DAC with electric drive
- DAC with folding lever
- DAC with horizontal lever
- xxx-x wagon ID




375-5      277-6      939-8      687-9      017-8      699-0      131-5

- Poznań Franowo
- Train shunting on the marshalling yard



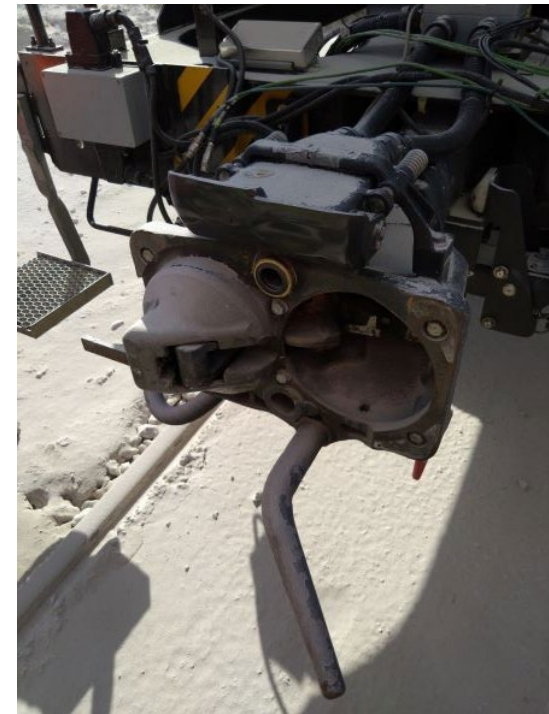
- Depending on the design of the uncoupling mechanism, it was possible to decouple single wagons and groups of wagons on the hump during movement of the train and with buffer positions off.
  - For couplers with electric buttons decoupling on the hump could be done during train movement. Wagon disconnections at 3-5 km/h train speed and at predefined locations were tested.
  - For couplers with mechanical handle working vertically decoupling on the hump could be done at a slow speed (3-5 km/h) using an additional tool (hook). Wagon disconnections at predefined locations were tested.
  - During uncoupling of the moving wagons, the predefined locations did not have to be met exactly.

- **Poznań Franowo**
- **Train shunting on the marshalling yard**



- ❑ **For couplers with mechanical handle working horizontally, decoupling on the hump could be done at zero speed only and in an exactly defined position on the hump. Using a tool wasn't possible mainly due to: (1) more than 90 degrees handle movement and (2) direction of the handle pulling is the same like direction of the moving wagons.**
- **Although the exact disconnection points for the wagons (distance from the top of the hump) have been calculated in advance, in a few cases the wagons stopped on the top of the hump and had to be pushed by hand in order to start rolling.**
- **This method was the most difficult to carry out and it's not operational.**
- ❑ **Disconnection of wagons with an empty brake pipe was tested. Quite often during disconnections, one coupler remained in the coupled position (brake pipe is open). Testing with 5 bar in brake pipe was not possible due to the risk of the distributor valve reaction.**
- ❑ **Almost 100% successful coupling at the classification tracks (not included situations when buffer position handle changed on its own).**
- ❑ **Generally positive feedback from shunting personnel.**

- **Cement Plant Lafarge near Inowrocław**
- **Exposure of the DACs part of the brake pipe to contamination generated during loading processes of bulk materials was investigated.**
- **Coupling tests on the curves were carried out (160 m- and S-curve).**



- **Wagons were standing in the siding for 18 hours, during this time, the loading of limestone and other building materials was carried out on the nearby tracks for about 4 hours.**

- **Cement plant Lafarge – Day I: Reference Conditions**



- **Cement plant Lafarge – Day II: Tests**



- ❑ **Visual checking of the contamination inside the open part of the brake pipe in the DAC-head showed that air was contaminated by dust and small particles of the lime stone material.**
- ❑ **The small particles of the lime stone material were caught by a piece of cotton cloth, which has been inserted between the air coupling heads. The amount of contaminants in the air raises serious doubts to the proper operation of the brake's pneumatic valves.**



- Cement plant Lafarge



- **Cement plant Lafarge**



- ❑ **In the opinion of the siding operator, it is possible to speed-up the manoeuvring processes on one part of the siding (cement plant), on the second part of the siding (lime stone mining) improvement will not be high.**

**There may be a problem of contamination of the main brake pipe when loading / unloading loose bulk materials - further investigation needed**

- **Coking plant Dąbrowa Górnicza**

- **The process of placing wagons in a typical rotary coal unloading device and their pushing them out was investigated.**
- **Rotation of the wagon**



- ❑ **The process was possible thanks to the buffer position function, which is activated only on one coupler. Wagons were successful coupled after being pushed out. Tests were carried out with 0 bar in the brake pipe.**
- ❑ **The behaviour of the DAC during the rotation of the wagon on the rotary unloading device was checked. It was observed, that wagons intended for rotary unloading (series E) must have a slide mounted on top of the support, in order to protect the coupler-shaft.**

- **Coking plant Dabrowa Górnicza**



- **Doubts of local employees:**

- contamination of the brake pipe with coal dust generated during unloading.
- switching on/off buffer position not ergonomically.
- DAC resistance to high temperature during heating in the defrosting hall

- **Further tests needed on the contamination issue, resistance to high temperatures and unloading of the two coupled wagons**

- **Marshalling yard Zabrzeg-Czarnolesie**
- **Train shunting on marshalling yard**
- **Wagons were braked by means of brake shoes (skids). (unreliable proces)**



- ❑ **The same method of decoupling the wagons on the hump was tested as in Poznań-Franowo station. Process was successful, no further conclusions.**
- ❑ **Due to the unreliable proces, wagons (both empty, loaded and mixed) were coupled at relatively high speeds (range 7,5 – 14 km/h). Recorded on some wagons forces weren't critically high. Draft gear/rubber spring preload forces of part of wagons were checked. The stroke indicators, where available, were also checked. No indication for a loss of preload force. The operation of the DAC in critical situations confirmed their durability and proper behaviour.**

- **Marshalling yard Zabrzeg-Czarnolesie**
- **Train shunting on the marshalling yard**



- ❑ **One protect rubber on the electric coupler on the DAC was unglued and got stuck between electric coupler and its cover. Electric coupler remained open. Safety issue.**
- ❑ **One time a decoupling by means of electric button was failed. Reason wasn't know, the electric decoupler was active. First assumption was an empty battery. For shunting operations, especially from the hump, indicator lights of the battery status would be helpful.**

**Thank you!**

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