8D Report #144118

Project :	ADA, Riyadh Metro Transit System&Consortium	**Awareness date :**	06/11/2019
Platform :	Turnkey Systems	**Opening date :**	14/11/2019
Customer :	ARRIYADH DEVELOPMENT AUTHORITY	**Update date :**	06/10/2021
Supplier :		**Closing date :**	//
		Step :	8/8

Title :	Loosening tightening torque on traction box fixation bolt M16 between Traction feet and CBS

D1	**Description**
	Created by GEBSKI Miroslaw on 2019-11-14
What, Where, How detected	Detected during retrofit proces on Metro Riyadh trains in Riyadh.
Why is it a problem	1. Possible lossing fixation and appear of flying objects loose nuts/washers/bolts. 2. Later if several positive fixation loose there may be a slipping of the attachment and a risk of breakage and loss of the traction box. Positive fixation applied
How Many	Nominal torque value 235Nm. Minimum required 170Nm for M16 botls Detected on 2 Traction boxes TS 422 and 424. Traxction boxes serial no: TS424 s/n 2009 - 3 bolts NOK 145Nm, 140Nm, 159Nm TS424 s/n 2014 - 1 bolt on limit 170Nm TS422 s/n 2005 - 1 bolt NOK 165Nm TS422 s/n 2004 - ll bolts confirmed OK TS609 sn 2055 - all bolts OK TS609 sn 2057 - all bolts OK
Objective to be reached	To back to quality conforimity
Impacted Product (PBS)	
FBS	

D2	**Stakeholders**

Team leader	GEBSKI Miroslaw	**Safety leader**	DANCOURT J-marc
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Region Site Solving	Europe	**Region Projet**	Africa Middle-East and C
Reporting Unit in charge solving the issue	TRA Katowice PL	**Reporting Unit in charge of integration**	TRA Katowice PL

D3	**Problem characterization**		
Provisional cost > 100K		**OTP reference**	
Kx classification	K1 Safety	**Current score**	3
Severity	Catastrophic	**Frequency**	

D4	**Containment**
Start Date (D4-KPI)	Containment action. Before dynamic run and or test in Riyadh residual tightening torque inspection for M16x80 (DTR0009908005) bolts mandatory to be performed.
Target start Date	2019-11-12
Start Date (D4-KPI)	2019-11-14
End of deployment	2020-03-03

Progress / result / next steps for deployment	*Update by GEBSKI Miroslaw on 2020-03-03T00:00:00* See MoM (enclosed Metro Riyadh MoM - Safety Qaulity Alert - Traction box fixing bolt torque NOK) Status on 19th December 2019. See enclosed summary file: RUH_TSY_RST_Traction bolts control sheet_19122019 Statystyka.xlsx. -> 8 trains remaining to be checked out of 69. 59 completed OK, 2 NOK detected (to be reworked and rechecked). 21-01-2020: Status" 62 checked OK, 7 to be checked until 31st January 2020. 11-02-2020: Status one train to be completed TS401. 67 out of 68 Trains checked status OK. See enclosed file Traction box status 11-02-2020.pdf and xls file -> RUH_TSY_RST_Traction bolts control sheet_11022020 Statystyka 03-03-2020: Last tran 401 checekd and completed -> see evidences RUH_TSY_RST_Traction bolts control sheet_02032020 Statystyka.xslx

List of actions

No	Actions (what?)	Resp. action (who?)	Due date (when?)	Date of completion
1001500	Relaxation for that particular connection (M16 Bolt) to be clarified by integrator (VPF) Philippe to check with Jean-Marc Langlet	CHARCUSSET Philippe	2019-11-15	2019-12-12
1001503	List of trains defined for T&C dynamic test to be shared to quality	MUSSA Taha	2019-12-12	2019-11-28
1001505	To check what solutions have been implemented on another project (with similar problem with bolted connections on traction box to underframe)	CHARCUSSET Philippe	2019-11-14	2019-12-12
1001507	Torque control to be done by Quality in RIY before releasing trains to T&C Dynamic tests based on that list from T&C DManager (as containment action)	GEBSKI Miroslaw	2020-02-20	2020-03-03
1001508	Who can do torque check in RIY instead of Quality to be clarified	GEBSKI Miroslaw	2019-11-21	2019-11-26

D5	Root causes
Progress / result / next steps for deployment	*Update by GEBSKI Miroslaw on 2020-05-13* To confirm root cause- paitn thicknes on traction feet. AT requirements/standard only primer =
Root causes Occurence	*Documentation - not detailed enough*

Root causes Non Detection	*, 3 - Control / Routine test issue*

List of actions to deploy the corrective solutions

No	Actions (what?)	Resp. action (who?)	Due date (when?)	Date of completion
1015262	To consider higher torque >235Nm to be applied on bolt to minimize relaxation of torque due to paint thickness	CHARCUSSET Philippe	2019-12-05	2020-01-21
1015263	To collect data of measures paint thickness of traction box feet by Polmor/KTW + visualization measuring point, quantity of point on both side of foot, average values calculation method	MORE Lobu	2019-12-05	2020-01-21
1015264	For 3 spare tractions proposed to perform tests ? Main purpose of test: is to check influence that paint thickness Is root cause of torque loosening and to check of presence only primer for residual torque: (Mattias until 19-12-2019)o Remove current paint layer on traction feeto Applied primer on ito To perform installation traction on train, apply torque 235Nm on M16 boltso To do check of residual torque ? Post meeting remark: Instruction with informations, How to remove paint, how much, and how to apply primer to confirm CRL/CJB/RIY	UVIN Mattias	2019-12-19	2020-03-03
1015265	For remaining traction boxes for retrofit. Main purpose of test: is to check influence that paint thickness Is root cause of torque loosening and to check of presence only primer for residual torque: (Mattias until 19-12-2019) o Installed tractions with standard installation process on traction transport jig before install traction to train o Main purpose of test: to reduce influence of paint thickness for torque relaxation (it due to fact that we still detected NOK torque after traction replacement in RIY ~average value 1-4 bolts per traction) o Remark: To check condition of paint surface after that process. Any damages, delamination of paint layers are not allowed to proceed future.	UVIN Mattias	2019-12-19	2020-03-03
1043753	Action defined in KTW with cooperation with Metro Dubai project. One taction box - paint layer removed on traction feet (both sides), apply only primer for bolted connection. Paint thickness of primer measured and recorded. Torque tightening inspection wil be done in same way as done for Metro Riyadh.	OLSZAK Rafa?	2020-04-30	2020-03-31
1056984	Traction box sn 1050 from Metro Dubai - torque inspection on M16 bolts to be done prior shipment to Dubai	OLSZAK Rafa?	2020-04-18	2020-05-13
1069436	To check torque on Traction 1050 after delivery train to Dubai.	OLSZAK Rafa?	2020-06-12	2020-12-07

D6	**Solution**

What does the solution consist of?	First to performe torque control 6 trains. 2 from begining of retrofit/exhcange traction box in Rijadh, 2 from middle 2 from end of retrofit proces. If results wil lbe OK no future actino required if one connection NON complete fleet inspection to be done. REX from Metro Amsterdam (8D 25160) based on informations recoded into 8D only one connection found NOK (pant thickens and paint layers q-ty are much more worst compare to Metro Riyadh solution) Control of additional 77 connection defined by Eng.
Mod reference	
Target start Date	2020-05-13
Start Date (D6-KPI)	2020-07-14
% done	100% on

List of actions to deploy corrective solutions

No	Actions (what?)	Resp. action (who?)	Due date (when?)	Date of completion
1069437	To determine torque inspection on fleet by Engineering (line by line) before put train into revenue service, or determine troque inspection on train Maintenance	CHARCUSSET Philippe	2020-11-19	2020-12-07
1148866	Control addtional 77 connection defined - see checklist updated.	GEBSKI Miroslaw	2020-12-31	2021-01-04

D7	Rex
List of recommendations	*Update by GEBSKI Miroslaw on 2021-05-11* In the central meca checklist ENG-RS-FRM-012 rev E, we have an item: GEN.54 which is a knockout question and which mentions the design rules for mechanical interfaces (shared by CRL Site Application Engineering Manager)
Plateform concerned by Rex	*Rolling Stock & Components* | *Components - Traction & Auxiliaries*
Metiers concerned by Rex	

Impacted projects have been notified ?	1

List of actions to engrave the lessons learn

No	Actions (what?)	Resp. action (who?)	Due date (when?)	Date of completion
1161576	To complete evidences for Traction paint system traction box design team/Engineer.	GEBSKI Miroslaw	2021-06-18	2021-06-15