

PRELIMINARY REPORT

10. Ensure the hot coach provide warning when there is a disconnected power supply at X60 in the Roof Top Compartment (RTC).
11. Ensure no coach ever enter into revenue service with the possibility of a "Hot Coach."
12. Ensure the lockout/tag out have the power source separated so that when a Mechanic is servicing a coach that bay is lockout/tag out and isolated from the other bays.

CORRECTIVE ACTION TAKEN:

1. The fleet of 4300s and 4500s were checked for proper hot coach detector functioning. This was done by Atlantic Electronic Technician shop.
2. If the hot coach detector fails it will provide a warning light and buzzer to the dash, via the same light as the hot coach warning, if it is receiving power from the coach.
3. VK recognized that this is an issue and is working on a retro fit to the system so that if XT60, at CPM 11 has a power failure, or becomes disconnected the hot coach alarm and lights will activate.
4. VK Engineering will install new programing and will make hardware modification that will enhance the three fail safe systems for Hot Coach detection that will be monitor for one week by both King County Metro (KCM) and Vossloh Kiepe (VK).
5. Kim Martin from Fleet Engineering, Andrew Goudreau, SO South Base, and James Wells, SO Atlantic Base debrief the employees at CSC to demystify and stop rumors concerning this electrical shock event. Training is being planned and scheduled for refresher on High Voltage

PRELIMINARY REPORT

CONCLUSION:

This office has determined Atlantic Vehicle Maintenance follow the Twelve recommendations and with the modification enhancing the three failed safe systems currently on the trolley coaches by adding a fourth and it allows notification by visual and audio if there is a faulty Hot Coach Detection System and following King County "Electrical Safety Program" for its employees working on "HIGH VOLTAGE" and WAC 296-45-015, 296-45-065(1), 296-45-25510(12), 296-45-115(2), 296-45-325(1) and NFPA 70E the risk matrix is ID. Without these recommendations and improvements to the Hot Coach Detection System a Hot Coach event can have a level of IA. See matrix and photos.

James Wells
Signature

06/12/2016
Date

JWE: jwe

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PRELIMINARY REPORT

RISK MATRIX:

Probability Categories				
Description	Level	Specific Event		
Frequent	A	Electrical event will occur		
Probable	B	Expect electrical event to occur		
Occasional	C	Circumstances expected for an electrical event; it may or may not occur		
Remote	D	Possible electrical event but unlikely		
Improbable	E	Electrical event will not occur		

Severity Categories		
Category	Severity	Characteristics
I	Catastrophic	Disastrous event (death or system loss)
II	Critical	Survivable but costly (severe injury or major system damage)
III	Marginal	Relatively inconsequential (minor injury or minor system damage)
IV	Negligible	Limited or no impact (less than minor injury or system damage)

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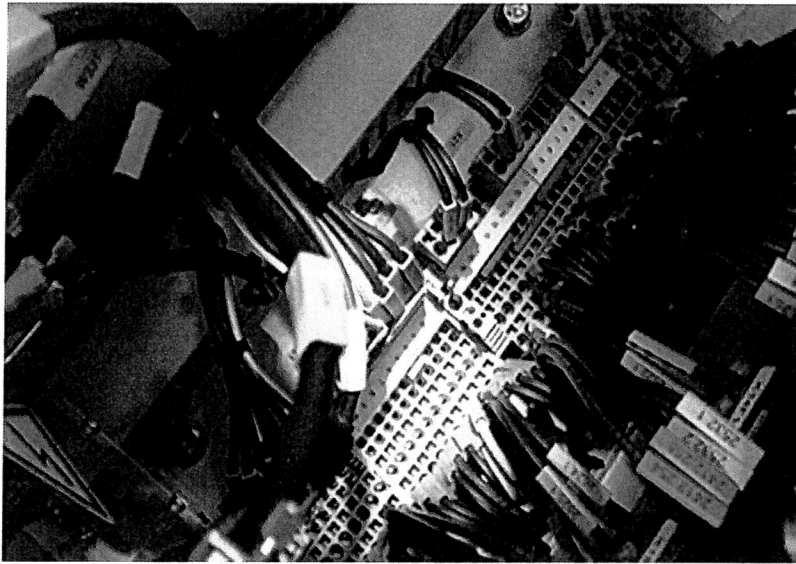
PRELIMINARY REPORT**RISK MATRIX:**

Electrical Risk Matrix				
Probability Categories	Risk Severity Categories			
	Catastrophic (1)	Critical (2)	Marginal (3)	Neglible (3)
(A) Frequent	IA	IIA	IIIA	IVA
(B) Probable	IB	IIB	IIIB	IVB
(C) Occasional	IC	IIC	IIIC	IVC
(D) Remote	ID	IID	IIID	IVD
(E) Improbable	IE	IIE	IIIE	IVE

	"HIGH" Risk must be mitigated
	"SERIOUS" Risk should be mitigated
	"MEDIUM" Risk is acceptable with review by management
	"LOW" Risk acceptable without review by management

PRELIMINARY REPORT

PHOTOS OF RTC:




X61 sticker – the X60 was not seen during this investigation.



The Electronic Technician looking at the location of the X60 connector that came loose or was disconnected.

317941132-


Division of Occupational Safety & Health MS: 44632				PHOTO IDENTIFICATION Single	
Inspection Number 317941132	Photo Date/Time 5/23/2016 2:20 PM	Photographer ID M7618 - GEORGE(DICK) MAXWELL			UBI 578037394
Name of Employer ATLANTIC MAINT BASE/KING COUNTY					

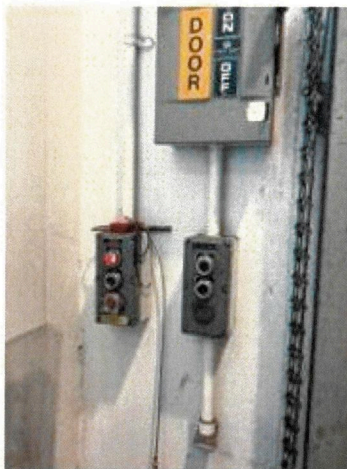


Disc #	Photo ID # Pringle switch Atlantic BaseIMG_0047.jpg	Citation/Item # 1-2
Location of Hazard 1555 Airport Way S Seattle WA 98134		
Description of Photo This photo shows the Pringle disconnect. Prior to the complaint the employees would put the LOTO key on top of the box		
F418-024-000 Photo-ID Single 9-06		

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317941132-

Division of Occupational Safety & Health MS: 44632				PHOTO IDENTIFICATION Single	
Inspection Number 317941132	Photo Date/Time 5/23/2016 2:20 PM	Photographer ID M7618 - GEORGE(DICK) MAXWELL		UBI 578037394	
Name of Employer ATLANTIC MAINT BASE/KING COUNTY					



The switch on the left is for the trolley 750 volts
the one on the right is for the door.jpg



w for bays 16&17 IMG_0054.jpg

Disc #	Photo ID # KCM LOTO trolley wire disconnect in bays 16 & 17.JPG	Citation/Item # 1-2
Location of Hazard 1555 Airport Way S Seattle WA 98134		
Description of Photo This photo shows the other style disconnects in bays 16 and 17.		
F418-024-000 Photo-ID Single 9-06		

Department of Labor and Industries



HECK Field Notes

Employer: King County MetroInspection Number: 317941132Date: 5-23-2016Time: 1420 hours

1. Describe the hazard in detail (photograph hazard if possible/applicable). Violation 1-2

There has not been an evaluation of the lock out procedure to detect the deficiencies. King County Metro Atlantic Base 1555 Airport Way S Seattle.

2. Describe how employee(s) are exposed or potentially exposed to the hazard. (Proximity to hazard, describe observed/unobserved/potential exposure.)

For the instance of the high voltage hazards, the employees have not had the necessary training to gain proficiency in recognizing the associated electrical hazards with an improper LOTO. The practice was to lock out then put the key on top of the box so other workers wouldn't be inconvenienced.

3. List equipment/machinery/tools, measurements, monitoring data (noise/lab results) where applicable.

The Pringle box, a high voltage disconnect with the capability of LOTO is the disconnect for the overhead trolley lines inside the Atlantic base shop which are 750 volts direct current. There are other push button devices for de-energizing the 750 volt lines in some of the truck bays but they are designed to de-energize two separate bays with either switch, improper LOTO could lead to accidental energization of a parallel feed..

4. List employee(s) exposed (names, job titles, addresses, email addresses, and telephone numbers):

Tim Nguyen Mechanic approximately 5 months at KCM one month at Atlantic Base no overhead trolley experience. Paul Stoppleworth mechanic twelve month employee on graveyard shift. Chris Zwiefelhofer lead mechanic supervisor role 28 years in the trade. Ray Martinsen mechanic, Ken Peterson lead mechanic 19.5 years in the trade, Bill Ritter mechanic, Arvin Vulliet mechanic, Kermit Gipson electronic tech., Bill Marion mechanic 36 years as mechanic now an inspector, Tom O'Bannon lead electronic tech. 27 year employee. These are just the employees interviewed for this complaint.

5. What did employee(s)/witnesses say about this violation/hazard? (Employee and/or witness statements.)

We Would just put the key on the box so someone else could use the switch if necessary. We have had some electrical hazard awareness training, some LOTO training but nothing formal as in a classroom mostly ojt. We used to have safety meetings but due to the lean project we now do group Huddles.

6. How long has the hazard existed? (Duration/frequency.)

This practice has existed until this inspection when the procedure changed to follow more traditional methods of LOTO.

7. What did management say about this violation/hazard? (Employer statement, written documents, and/or due diligence.)

The Pringle box is now being locked and tagged, and the authorized person keeps the key with his self.

8. Mitigating and/or contributing factors/miscellaneous: (Statue, employer claims there is no employee relationship, dual employer, controlling employer, etc.)
-
-

9. Describe the abatement status/method.

Documentation showing that the procedure to perform periodic reviews according to 803-70005 is being developed.

Continue on back if needed

**King County**

Atlantic Base Vehicle Maintenance
M/S ABM-TR-0200
15555 Airport Way South
Seattle, WA 98134

DATE: July 22, 2016

TO: All Atlantic Base Shop Personnel

FROM: Bruce Lillquist, Superintendent Atlantic Base Vehicle Maintenance

SUBJECT: Pringle Box Lock Out Procedure

Starting immediately this is to be the procedure for locking out Pringle boxes for roof top or other work:

- When locking out a Pringle box always use a group lock out hasp for multiple padlocks no matter how many locks are being installed initially. That way another person can easily add their padlock as needed without having to track down the first person.
- Always put your tag with your name on the padlock. We will issue one tag to each employee who uses Pringle boxes.
- Keep your key with you at all times. Do not put keys on top of the Pringle box. If you leave for a road call, leave your key with your Lead until you return to the shop. Inform the Lead of the status of lockout.
- When leaving for the day always remove the lock and tag and let the next shift lock it out if needed.
- The group hasp and padlocks will be attached to Pringle boxes.
- If the person whose tag is on the lock has gone home for the day at the end of the shift, and this is verified with chief and lead, the chief or lead may cut the lock off.

Complaint KCM Opening Notes 5-23-16 Bruce Lilgus
 Mich. got Shocked a week ago James Wells
 280 volts
 2 Cords went bad

- Bill Marion Poles on Conductor
- Hot Coach indicator wired wrong
 Hot Coach Det. did not go off
- we found the Cause -
- there is a weak spot in the Alarm System
 we are fixing the whole fleet
- Hot Coach prevention is ~~not~~ working
 Audible will come on unless -
- 700 volts DC. trally
- 600 volts - DC Coaches

MTg at Engineering

Lea Alcyon - Kim - elec. Safety Program.

Train of WDC, NFPA 20 E
Kim - Hands on exp.

Hybrid - 2002-2004 2K, 8K are 6 at Atlantic

- Hot Coach w/ tralleys Confined to Atlantic base
Run out of + Maint-

Hot Coach Det. Sys

new tralley have batt. can go 9 mi to 6 mi

Hot Coach pulls the Poles gives warn! 40 v on Coach
drop Poles at 60 v

Hot Coach done during insp. by Mech
✓ once a month

→ ground wire missing - Hot Coach det. unit
✓ Fleet no other instances

CSC Component Supply Center

→ Mech. don't work on energized

→ Electronic tech.

317941132-

31702...08-

Kim martin - fleet engineering - 8-3-11

Grnd wire Hot Coach Detector - was disc.

Found Path to ground through its on sensing circuit
it was inoperable

→ It took a Software change to correct. done
by V.K. - New Flyer own Platform V.K. has the
propulsion system

→ Tom was given the software to install

Lead Samer -

Kim - Tom and his group made sure we didn't
have Coach - Volt Measure or Phase ✓

→ all Polarity was OK to make sure fleet was safe
→ then do a visual ✓

We were not given a Hot Coach Det. procedure

→ Gen mech. do not work on energized

→ Heater Box was wired hot from factory
✓ all boxes had Cont. to ground then visually

→ b - failed because of paint on the ground.

New Flyer

Illig

Orion.

E.S.S. Elec. Storage System

L.H. Iron Batt. Mang. System
Metal

If System Fails or det. a fault takes coach off line
H.V. interlock loop Series of S/w any time you break
a S/w when Contactor open

→ We do not open at Shop send them + ~~CO Sup~~
CSC Component Supply Center

→ We make our own battery packs

9/15/2016 LNI CLOSING MEETING

DARRYL RUSSELL (206) 477-6860 darryl.russell@kingcounty.gov

MARC ANDERSON (206) 477-6856 marc-dot.anderson@kingcounty.gov

JAMES WELLS (206) 477-7877 James.Wells@kingcounty.gov

KIM MARTIN (206) 477-6875 kim.martin@kingcounty.gov

9-15-16 4700 CES USA -

1530 hr → We covered the training issues - specific to 43 & 4500 Series

ARC haz wear, gloves, hot sticks, MAD,

→ Discussed 480 volt heater Possible ungrounded Delta

→ LOTO was discussed - applies to all even outside Atlantic base

→ Changed Abatement to 30 days -

→ 2 R.S. VIO in last 3 years Below Avg. Risk

→ All Safety Haz. related to Hot Coach det. & heaters have been abated -

Peterson, Kenneth

From: Peterson, Kenneth
Sent: Saturday, June 25, 2016 10:39 AM
To: Alley, John; Kevin Hiemenz; Dan Groves; Jay Costa; Lillquist, Bruce; Mudge, Rick; Keelan, Tom; Hanson, Ian; Phinney, Craig; Wood, Frank; Johnson, Timothy; Zwiefelhofer, Chris; Brunner, Peter
Cc: Kilborn, Heather; Johnson, Kevon; Star, Tessa; Stevens, Nate; Thon, Bill; Matteoni, Lynn; Lillquist, Bruce; Dan Groves; Jay Costa; Farrar, R; Scott Halbesma; Brydon Owen
Subject: RE: Spool Speed adjustment for De-Wire issue

Good morning,

I want to make sure I am clear on John's directive to follow NF/VK's recommendation:

- Bring "All" 25 coaches that have been adjusted, back to factory settings (under the tutelage of Raimund), as we will no longer have any password to perform this procedure (for rope reel speed)?
- We will not adjust (in any way) any coach for a pole dropping issue until we have proper authorization from NF/VK via VM management?
- We will assist Raimund in the installation of the "Two New Springs" (when they arrive by Wednesday)?
- As recommended by NF/VK, we will not make any adjustments to the any of the systems of the coaches, until NF/VK comes out to assist us, especially when there are "Very High Risk" situations to overhead power, the coach/s, and passenger/pedestrian safety involved?

If we follow these strict guidelines (maybe we have to legally?), we will not make our sign-out requirements, that means we are going to miss runs. We have too many fleet issues (that this Shop has been bandaging).

If the above is what is to be strictly followed, then there are some items that we should also address:

- I would like to ask that the Pole dropping issues be looked at as a secondary concern! The "Hot Coach Detector" is not fully functional (as "All" of you know), and we need fast support to resolve this! This is of far greater risk value to the KCM, the public, and every person that comes in contact with these coaches, than pole dropping.
- We are also needing a resolution to a problem that has been put on the back burner for a very long time. Heat Fails! I also ask that we get all hands on deck!
- Power Steering?????
- The latest failure that we have been plagued with, is Lift Ramp failures. Where are we at on this problem?

I was here when Atlantic Base built the 4100 fleet, and saw amazing things happen to get the coaches to a successful point of reliability. A lot of the people that were here then, are here now, and continue to have the same drive and determination, and commitment, to seeing these new coaches achieve the same level of reliability that the public deserves. We have some seriously talented folks here, and regardless of what kind of personal attacks/ and e-mails get sent, these folks care about what they do. We are true Craftsman, and we fix things, it's in our genetic make-up! Either get serious about helping us, or get out of our way, and let us keep trying to help the cause, which is getting these coaches on the road 24/7. Sorry if anyone gets offended by this, but if we at Atlantic Base didn't care, I wouldn't bother writing this.

Thanks!

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From: Alley, John
Sent: Friday, June 24, 2016 2:14 PM
To: Kevin Hiemenz; Dan Groves; Jay Costa; Lillquist, Bruce; Mudge, Rick; Keelan, Tom; Hanson, Ian; Peterson, Kenneth; Phinney, Craig; Wood, Frank; Johnson, Timothy; Zwiefelhofer, Chris; Brunner, Peter
Cc: Kilborn, Heather; Johnson, Kevon; Star, Tessa; Stevens, Nate; Thon, Bill; Matteoni, Lynn; Lillquist, Bruce; Dan Groves; Jay Costa; Farrar, R; Scott Halbesma; Brydon Owen
Subject: RE: Spool Speed adjustment for De-Wire issue



Thank you,
 John

From: Kevin Hiemenz [<mailto:Kevin.Hiemenz@newflyer.com>]
Sent: Friday, June 24, 2016 2:13 PM
To: Alley, John; Dan Groves; Jay Costa; Lillquist, Bruce; Mudge, Rick; Keelan, Tom; Hanson, Ian; Peterson, Kenneth; Phinney, Craig; Wood, Frank; Johnson, Timothy; Zwiefelhofer, Chris; Brunner, Peter
Cc: Kilborn, Heather; Johnson, Kevon; Star, Tessa; Stevens, Nate; Thon, Bill; Matteoni, Lynn; Lillquist, Bruce; Dan Groves; Jay Costa; Farrar, R; Scott Halbesma; Brydon Owen
Subject: RE: Spool Speed adjustment for De-Wire issue

Understood John, we will keep the pressure on this issue with VK.

Thanks

Kevin

From: Alley, John [<mailto:John.Alley@kingcounty.gov>]
Sent: Friday, June 24, 2016 4:11 PM
To: Kevin Hiemenz <Kevin.Hiemenz@newflyer.com>; Dan Groves <Dan.Groves@newflyer.com>; Jay Costa <Jay.Costa@newflyer.com>; Lillquist, Bruce <Bruce.Lillquist@kingcounty.gov>; Mudge, Rick <Rick.Mudge@kingcounty.gov>; Keelan, Tom <Thomas.Keelan@kingcounty.gov>; Hanson, Ian <Ian.Hanson@kingcounty.gov>; Peterson, Kenneth <Kenneth.Peterson@kingcounty.gov>; Phinney, Craig <Craig.Phinney@kingcounty.gov>; Wood, Frank <Frank.Wood@kingcounty.gov>; Johnson, Timothy <Timothy.Johnson@kingcounty.gov>; Zwiefelhofer, Chris <Chris.Zwiefelhofer@kingcounty.gov>; Brunner, Peter <Peter.Brunner@kingcounty.gov>
Cc: Kilborn, Heather <Heather.Kilborn@kingcounty.gov>; Johnson, Kevon <Kevon.Johnson@kingcounty.gov>; Star, Tessa <Tessa.Star@kingcounty.gov>; Stevens, Nate <Nate.Stevens@kingcounty.gov>; Thon, Bill <William.Thon@kingcounty.gov>; Matteoni, Lynn <Lynn.Matteoni@kingcounty.gov>; Lillquist, Bruce <Bruce.Lillquist@kingcounty.gov>; Dan Groves <Dan.Groves@newflyer.com>; Jay Costa <Jay.Costa@newflyer.com>; Farrar, R <ryanf77@aol.com>; Scott Halbesma <Scott.Halbesma@newflyer.com>; Brydon Owen <Brydon.Owen@newflyer.com>
Subject: RE: Spool Speed adjustment for De-Wire issue

AB will follow the recommendation of NF/VK Kevin:

However, I will stress again that we need concrete expeditious action on resolving this issue early next week. Our operators are frustrated with our delay in finding a fix and having to re-attach the poles is a delay to our traveling customers.

I appreciate NF/VK's urgency in this matter. Keep us all informed.

Thank you,
 John

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From: Kevin Hiemenz [<mailto:Kevin.Hiemenz@newflyer.com>]

Sent: Friday, June 24, 2016 1:49 PM

To: Alley, John; Dan Groves; Jay Costa

Cc: Kilborn, Heather; Johnson, Kevon; Star, Tessa; Stevens, Nate; Thon, Bill; Matteoni, Lynn; Lillquist, Bruce; Dan Groves; Jay Costa; Farrar, R; Scott Halbesma; Brydon Owen

Subject: RE: Spool Speed adjustment for De-Wire issue

John,

Thanks for the call, I followed up with Dan regarding the test springs they have not arrived at the Service Center yet, the test springs are coming from Germany and are scheduled to arrive at this point Monday afternoon or Tuesday morning from what we can see, so not sure who stated the parts were sitting at the service center, anyhow once they arrive we will be checking to make sure all parts are correct and are ready to install on the test bus, we will notify Atlantic Base so the bus is ready when Raimund arrives. At this point I see this being completed on Wednesday at the latest, if anything changes we will let you know.

Regarding the changes made to the "Spool Speed" on the 25 buses (40' and 60' trolleys), in digging into this, Raimund did provide the troubleshooting software to the tech's at Atlantic base and early on he did give his password to one of the Techs (Tom? Not sure) for another purpose which was some time ago to be able to address an issue with the retrievers is my understanding. Regardless we will correct this so the techs will not have the ability to make changes, just troubleshooting/diagnostic ability.

After further discussion regarding the changes made to the Spool Speed on the 25 buses, these buses need to be brought back in and re-set to the original specs as they arrived with, if I understand it correctly the change made to the "retrieval speed pole down" when a de-wire happens, which in turn will allow the poles to raise up high enough to possibly come in contact with the wires or become entangled.

As discussed this has a very high risk factor as it may not only cause damage to the bus it may cause further damage to the wires/grid shutting down a service area and passenger/pedestrian safety.

We do understand your urgency behind getting this issue addressed and can respect the fact that KCM is looking at other options in addressing this issue as well. Kiepe is engaged as well understands the urgency in addressing this issue and we will continue to keep the pressure on them. In the future may I request that we discuss this requested change prior to with the right audience to make sure we cover all of our basis to ensure we do not put ourselves/organizations at a high risk of exposure.

Please confirm that the buses will be brought in and set back to the original settings.

If you have any questions please feel free to contact me.

Thanks
Kevin

From: Alley, John [<mailto:John.Alley@kingcounty.gov>]

Sent: Friday, June 24, 2016 12:20 PM

To: Dan Groves <Dan_Groves@newflyer.com>; Kevin Hiemenz <Kevin.Hiemenz@newflyer.com>; Jay Costa <Jay_Costa@newflyer.com>

Cc: Kilborn, Heather <Heather.Kilborn@kingcounty.gov>; Johnson, Kevon <Kevon.Johnson@kingcounty.gov>; Star, Tessa <Tessa.Star@kingcounty.gov>; Stevens, Nate <Nate.Stevens@kingcounty.gov>; Thon, Bill <William.Thon@kingcounty.gov>; Matteoni, Lynn <Lynn.Matteoni@kingcounty.gov>; Lillquist, Bruce

<Bruce.Lillquist@kingcounty.gov>

Subject: RE: Spool Speed adjustment for De-Wire issue

Kevin:

I will try and call you!

Thank you,
John

From: Thon, Bill

Sent: Friday, June 24, 2016 9:22 AM

To: Matteoni, Lynn; Lillquist, Bruce

Cc: Alley, John; Kilborn, Heather; Dan Groves (Dan_Groves@newflyer.com); Kevin Hiemenz; Jay Costa (Jay_Costa@newflyer.com); Johnson, Kevon; Star, Tessa; Stevens, Nate

Subject: RE: Spool Speed adjustment for De-Wire issue

Why would another unsupported modification be contemplated in the first place, and why would more modifications be made to this system without VK's input, and approval??? Didn't we learn anything from the power steering issue, the ramp issue, the hot coach issue??? Especially when they've been clearly tasked, and have been responsive in attempts to resolve this, as they have with every issue presented, then resolved. As I understand it they already have a set of new springs to test... Which everyone, (including Phinney) said were the cause of this issue, and all parties agreed, including VK, instead of giving them time to re-engineer new springs we chose to start "playing" with their system, again...

I'm far from a trolley expert, compared to The AB folks, but even I know that speeding up the retractors puts our wire in jeopardy as the recovery speed is the active part of a de-wirement, and a faster retriever speed can seriously damage the overhead if there's an "entanglement" of the poles....

By the way, how did we get access to changing Parameters?? This is a serious safety concern, again, somehow we have inappropriately attained read write capacity, or at least capacity to change Parameters. This does nothing but shift all liability to King County for damage to our wires and any other damage created that could have gone to VK under warranty, or worse yet, in a court case after we've injured someone... WE NEED TO STOP DOING THINGS LIKE THIS!!

Thanks,
Bill Thon,
Contract Administrator
King County Metro

From: Matteoni, Lynn

Sent: Friday, June 24, 2016 5:19 AM

To: Lillquist, Bruce

Cc: Keelan, Tom; Hanson, Ian; Mudge, Rick; Alley, John; Kilborn, Heather; Thon, Bill; Dan Groves (Dan_Groves@newflyer.com); Kevin Hiemenz; Jay Costa (Jay_Costa@newflyer.com); Johnson, Kevon; Star, Tessa; Stevens, Nate

Subject: FW: Spool Speed adjustment for De-Wire issue

Bruce,

Per the email below, it is NFA and VKs expressed desire that the two test coaches running with altered spool speed be reset to factory settings immediately. The modification made by your folks is not in agreement with VK or NFA and this alteration will risk warranty protection of the reels for coaches currently in test.

VK and NFA are working diligently to resolve our issue; Raimund will be there next Tuesday to install a set of test springs in an effort to correct the pole drop condition.

Thank you,

Lynn

From: Dan Groves [mailto:Dan_Groves@newflyer.com]
Sent: Thursday, June 23, 2016 4:36 PM
To: Matteoni, Lynn
Cc: Kevin Hiemenz; Jay Costa; Thon, Bill
Subject: RE: Spool Speed adjustment for De-Wire issue

Lynn,

We have received word from VK Corporate and there not in agreement with this change. The recommendation would be to set the speeds back to where factory setting are. This is, as explained in prior e-mail, to stop a possible catastrophic failure of the infrastructure during a De-wiring incident.

I would appreciate a priority set on getting this accomplished if at all possible.

Raimund is also scheduled to go to Atlantic Base on Tuesday to install a set of test springs. We, NF and VK are working the issue and are in hopes the final resolution will be available shortly.

Thanks

Dan Groves
 Regional Product Support Manager
 cell (320)428-5879
dan_groves@newflyer.com



From: Dan Groves
Sent: Thursday, June 23, 2016 9:42 AM
To: Matteoni, Lynn <Lynn.Matteoni@kingcounty.gov>
Cc: Kevin.Hiemenz@newflyer.com; Jay.Costa@newflyer.com; Bill Thon - King County Metro (bill.thon@kingcounty.gov) <bill.thon@kingcounty.gov>
Subject: Spool Speed adjustment for De-Wire issue

Lynn,

As you requested, I did in fact speak with Raimund about Atlantic Base adjusting the recovery Spool speed to stop the De-Wirement occurrences or slow them down. First is that Raimund had this mentioned to him while at Atlantic base as well.

Next is that, although Raimund did not tell them not to, he is in disagreement of this being a fix stating that the speed is there to protect the Infrastructure during a pole De-wire issue. That being stated, he has also sent this information off to Engineering for their input and either denial or acceptance of this as a solution or temporary solution.

Raimund is awaiting the response and as soon as we get this information back, we will present it to you and the direction that VK would agree to.

Thanks

Dan Groves

Regional Product Support Manager

cell (320)428-5879

dan_groves@newflyer.com



Service

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CLOSING CONFERENCE HIGHLIGHTS PROPOSED VIOLATIONS

Important: This document is for your information only and may differ from the Citation and Notice that will be sent to you at a later date.

Employer ATLANTIC MAINT BASE, Inspection 317941132

This closing conference is held to discuss the inspection findings and any hazards(s) discovered during the inspection. During this conference a discussion will occur on the actions necessary to abate any hazard(s) discovered and the date by which they must be corrected or abated. The department routinely allows employee representatives to be present during the closing conference. However, either the employer or the employee representatives may request separate closing conferences. In accordance with WAC 296-900-13010, employees or their representatives may request copies of Citation and Notices issued to the employer.

Citation & Notice (C&N):

You will receive a Citation and Notice containing the alleged cited violations(s) and the date by which the alleged violation(s) must be abated or corrected. Any alleged violations cited as serious will have a monetary penalty as required by RCW 49.17.180. The findings of this inspection and the recommendations of the inspector are subject to change prior to C&N issuance.

Citation	Item	Group	Classification	Standard or Law Violated	# Days to Correct
1	1		Serious	296-800-14020	30
1	2		Serious	296-803-70005	30

Posting Requirements (WAC 296-900-13015)

You must post the Citation and Notice for three (3) working days, or until the last violation has been corrected, whichever is longer. **You must comply with these posting requirements even if you appeal the citation, or if no violations were noted.**

Your Rights As An Employer (RCW 49.17.140 and WAC 296-900-17005)

You have fifteen (15) working days from the date you receive your Citation and Notice to file a written appeal. You may appeal all or part of any alleged violation including the violation, penalty or abatement date.

Your notice of appeal must include the business name, name, telephone number; the name and address and telephone number of any person representing you; the citation number; what you think is wrong with the citation or corrective notice and any related facts; what you think should be changed and why. You should also state whether all the violations on the citation, or just specific violations, or only the penalties, are being appealed.

An appeal does not stay the abatement date for serious, willful, repeat serious, and failure to abate serious violations, unless a stay of abatement date is requested and granted by the Department of Labor & Industries according to WAC 296-900-17006, or by the Board of Industrial Insurance Appeals according to WAC 296-12-050. For any appealed general violation(s) and violation(s) for which a stay of abatement date is granted, this requirement is postponed until a final order is issued for the violations(s).

Labor and Industries has the option to forward the appeal to the Board of Industrial Insurance Appeals, an independent state agency, or to reassume jurisdiction and hold an informal conference to try and resolve the citation.

At the informal conference you should be prepared to briefly explain your reasons for the appeal and be ready to provide any additional information you would like the department to consider.

Employees may appeal only the abatement date.

Employer Certification of Abatement (WAC 296-900-150)

An Employer Certification of Abatement form will be included with the Citation and Notice (C&N) you receive. The form requires that you certify that each of the violations has been corrected and that affected employees and their representatives have been informed of the abatement activities. The form is also used by the department to track compliance with the violations(s) cited.

If the compliance inspector requests more documentation of abatement for willful, repeated or serious violations, you must furnish the additional documentation in accordance with the citation and notice and WAC 296-900-15005. This documentation may include, but is not limited to information such as photographs, copies of written programs, or training records, evidence of purchase/repair, or other written documents.

If there are multiple sets of abatement dates, updated copies must be submitted for each set of dates. Failure to submit the Employer Certification of Hazards Corrected can trigger a follow-up inspection and/or additional penalties.

Extension of Abatement Dates (WAC 296-900-16005)

When a violation cannot be corrected by the agreed upon abatement date, an extension may be requested. The extension request must be submitted in writing prior to the abatement date and contain the elements outlined in WAC 296-900-16005.

Follow-up Inspection and Failure to Abate

If you receive a C&N, a follow-up inspection may be conducted to verify that the citation was posted, the violations were corrected, and the employees were adequately protected during the abatement period. Violations that have not been corrected by the set abatement date or extended abatement date are subject to an additional citation for Failure to Abate, with additional penalties assessed.

In addition, the Washington Industrial Safety and Health Act (WISHA) clearly states that you have a continuing responsibility to comply with the Act and to provide a safe and healthful workplace for employees. (RCW 49.17.060)

Employee Discrimination (RCW 49.17.160 and 296-360 WAC)

By law, your employees must be allowed to participate in the DOSH inspection. They must be paid for the time they spend assisting the Compliance Inspector or doing related activities. They may not be fired, demoted, or otherwise discriminated against if they talk to the Inspector, file a complaint about unsafe or unhealthy working conditions, or exercise any other right protected under the Act.

If you have any questions concerning the inspection, please contact the Compliance Inspector, or the supervisor.

For additional information about DOSH and the various programs available, you may visit our web site at lni.wa.gov/safety.

For information about filing a public records request, you may visit our web site at lni.wa.gov/Main/AboutLNI/PublicDisclosure.

Safety and Health Program Evaluation (SHAPE sheet)

Division of Occupational Safety & Health
MS: 44630

Employer King County Metro	Inspection Number 317941132
---	--

	YES	NO	N/A
Is there a WISHA poster posted at this place of employment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer have a written accident prevention program?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are employees provided safety orientation?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the APP cover at least the basic elements and is it tailored to the operational needs of the workplace?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety Orientation including:			
<ul style="list-style-type: none"> A description of the employer's total safety and health program. On-the-job orientation showing employees what they need to know to perform their initial job assignments safely. How and when to report on-the-job injuries including instruction about the location of first-aid facilities in your workplace. How to report unsafe conditions and practices. The use and care of required personal protective equipment (PPE). What to do in an emergency, including how to exit the workplace. Identification of hazardous gases, chemicals, or materials used on-the-job and instruction about the safe use and emergency action to take after accidental exposure. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer have a procedure for enforcing safety rules	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is the APP implemented?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer effectively investigate accidents and make changes based on findings?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the employer established a foreman/crew meetings or an informal safety committee?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
May elect to have foreman/crew meetings which were held	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Designated H&S committee if > 10 EEs.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> employer and employee-elected members. Not to exceed 1 yr. chairperson elected by committee frequency of meetings determined by committee (also date, time, location) written meeting minutes on file for one year. subjects to be covered: S&H inspection reports reviewed to correct unsafe conditions or practices; accident investigation evaluations determine if causes of unsafe acts or conditions are properly identified and corrected; evaluate overall APP and recommend improvements. 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the employer do an assessment of the workplace to establish what PPE is necessary?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the employer certify, in writing, that the assessment had been done?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the employer in an SIC code that requires an OSHA 300 log?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer, with 11 or more employees, keep an OSHA 300 log?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer post the summary from February 1 through April 30?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there a written and implemented chemical hazard communication program for hazardous chemicals?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer have an inventory of hazardous chemicals in the workplace?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are there accessible MSDSs for each hazardous chemical in the workplace?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the employer provide training to employees in the hazard communication program?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has the employer addressed heat stress issues?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do employees handle strong irritants, toxics or corrosives?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Do employers use appropriate PPE?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are there emergency eyewash facilities when use could result in exposure to eyes?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Are there emergency showers when use could result in exposure to body?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Do the emergency washing facilities meet the requirements for flow, travel time, access, annual inspection, & weekly checks?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Yes	No	NA
Does the employer have conditions that require an energy control program (ECP)? (repair own equipment, have hardwired electrical)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the employer develop a written ECP?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the employer develop specific step-by-step procedures for equipment and machinery that has more than one power source?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Did the employer perform an annual evaluation of the ECP to ensure procedures are being followed?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Were employees trained in the ECP?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Did the employer provide EC hardware such as padlocks, pins, wedges, chains, blanks and such to lock equipment out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Is there a clinic, infirmary or hospital in near proximity to the workplace? (5 minute unobstructed travel)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Is there a person or persons adequately trained to render first aid?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Does the employer have adequate first aid supplies?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Are employees exposed to loud noise?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the employer have a hearing conservation program in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> Noise survey Hearing protection Engineering controls Audiograms Training 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Are employees exposed to hazardous atmospheres?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Do employees wear dust masks or respirators?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there a respiratory protection program in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> Written program Administrator Respirator/cartridge selection Medical evaluation Fit test Training 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Are there any confined spaces at the workplace?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Large enough to bodily enter, not intended for human occupancy, limited access & egress)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Do employees enter confined spaces?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is there a confined space program in place?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> Evaluation Signs Permit required? 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

REFERRAL TO: ☐ IH ☐ Safety for:

COMMENTS: The LOTO has improved since this
complaint inep. James Wells is making changes

News

King County Executive
Dow Constantine

King County launches next generation of electric trolleys and previews new battery-powered bus

August 18, 2015

Summary

For the first time in nearly three decades, King County Metro riders will enjoy completely new state-of-the-art electric trolleys in downtown Seattle and nearby neighborhoods starting August 19. King County Executive Dow Constantine also previewed a prototype battery-powered bus that could become the next era of transit technology.

Story



63

The new trolleys will use up to 30 percent less electricity than the current fleet and will significantly reduce operating costs.

317941132

Bus riders are about to see a fifth color—purple—added to the fleet of electric trolleys that serve the City of Seattle, as King County Metro Transit introduces the first completely new state-of-the-art electric trolleys in nearly 30 years.

"Electric trolleys are ideal for moving people in dense urban environments, making up 12 percent of our fleet but carrying 20 percent of our weekday riders," said King County Executive Dow Constantine. "And they emit zero emissions. By running trolleys instead of diesel-hybrid buses over the next five years, we are keeping 42,000 metric tons of greenhouse-gas emissions out of our air."

"I've been pleased to fight hard to keep our all-electric trolley fleet in operation and on the streets of Seattle," said King County Council Chair Larry Phillips. "These new all-electric buses are perfect for neighbors, keeping our neighborhoods quiet, and a win for transit riders, the environment, and the financial bottom line."

The first five of 174 replacement trolley buses go into service August 19, with the remaining trolleys phased in over the next two years. Deployment of the new trolleys, along with the arrival within a few months of three new prototype battery buses, continues to position Metro as an industry leader in expanding the use of green technology in public transportation. The new trolleys will use up to 30 percent less electricity than the current fleet and will significantly reduce operating costs.

New state-of-the-art trolley fleet saves energy and money

Among the benefits riders will enjoy on the new trolleys manufactured by New Flyer will be the addition of passenger-activated back doors for easier exiting, and the ability of buses to go off-wire for short distances to detour around construction zones and other obstacles and stay on schedule. The buses will also have air conditioning and low floors for easy boarding.

Metro, which operates the second-largest trolley fleet in the nation, will initially deploy 110 40-foot vehicles, with the first 60-foot coaches arriving in early 2016. The City of Seattle is purchasing 14 new trolleys with funds recently approved by voters.

"Since June—in just the first two months of expanded service in Seattle—we've seen an increase of 5,000 daily transit trips," said Seattle Mayor Ed Murray. "We are ushering in a new era of bus transit in Seattle and new service means new buses. Electric trolleys are still the best zero-emissions technology available, even after 75 years."

Cost of the new trolley fleet is an estimated \$186 million, with about 65 percent paid by federal grants. The electric trolley system will cost less to operate than Metro's hybrid fleet, once fuel consumption, maintenance, and grant funding are factored in.

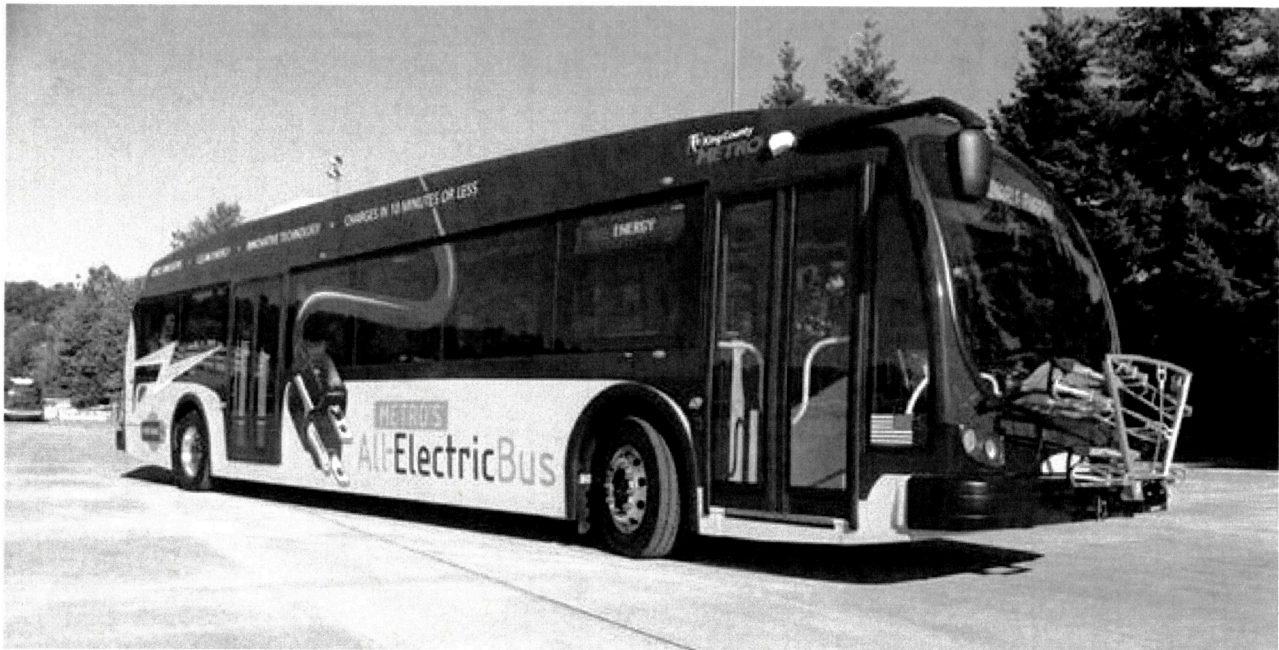
Metro has been extending the life of older buses through refurbishment, but those coaches become outdated and unreliable as their electrical systems and motors wear out. A 2009 County performance audit confirmed that, when compared to their diesel-hybrid

64

counterparts, electric trolley buses are quieter, use less energy, perform better on hills, and are more cost-effective to operate.

317941132-

New battery-operated prototype buses look beyond the wire



Metro will test prototype electric battery buses to see if they can be used in the fleet of the future.

Beyond the new trolleys, Metro is pursuing more innovation, thanks to a \$4.7 million federal grant. Over the next four to six months, Metro will take delivery of three 40-foot prototype heavy-duty battery-electric buses with fast-charging batteries, manufactured with a composite body by Proterra, Inc.

The new 38-seat buses can travel up to 23 miles between charges, and remain on the road up to 24 hours a day. Batteries take 10 minutes or less to charge. The prototype bus is expected to get 15 miles more from an equivalent unit of energy than a diesel-hybrid coach. A battery-charging station has already been set up at the Eastgate Park-and-Ride lot.

Metro will test the performance and efficiency of the new technology for up to a year on local streets and roads, to determine whether battery-electric buses can be a future replacement option for Metro. The three prototypes will likely be tested on short routes serving the Eastside and downtown Seattle.

Quotes

65

“

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Dow Constantine, King County Executive

“

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“

Since June—in just the first two months of expanded service in Seattle—we've seen an increase of 5,000 daily transit trips. We are ushering in a new era of bus transit in Seattle and new service means new buses. Electric trolleys are still the best zero-emissions technology available, even after 75 years.

Ed Murray, Seattle Mayor

317941132

Videos

The following videos show Metro's new electric trolley features and the factory battery-bus charging process.

64

HYBRIDDRIVE SERIES-E ENERGY STORAGE SYSTEM (ESS)

THE SMART ELECTRIC

**SERIES-E: THE "SMART" ELECTRIC
IS A COMPLETE ELECTRIC
PROPULSION AND POWER SYSTEM;
AND WITH 4,500 SYSTEMS
OPERATING AROUND THE WORLD,
BAE SYSTEMS IS CONTINUALLY
INNOVATING AND BRINGING ZERO-
EMISSION TECHNOLOGY
TO TRANSIT.**

BAE Systems' HybridDrive Energy Storage System (ESS) is based on lithium-ion nano-iron-phosphate technology and uses an advanced battery module design to provide very high power and energy density in a compact, lightweight enclosure. The system delivers power during acceleration and peak power. It accepts power (regenerative braking energy) during deceleration. The use of lithium-ion technology enables the system to be substantially smaller and lighter than other energy storage technologies.



Single air-cooled enclosure
84 x 41 x 12 inches
(213cm x 104 cm x 30 cm)
16 individual modules each
at 18 lbs (8.2 kg)



Individual ESS module

The significantly reduced system weight contributes to improved fuel economy, and reduced brake wear, and allows for greater weight capacity for passengers. BAE Systems specifically selected nano-iron-phosphate version of lithium-ion chemistry for its thermal stability and safety. The modular construction enables easy servicing. The HybridDrive Series-E ESS includes improved filtering, enclosure updates, and better environmental protection of module electronics for improved reliability, safety, and service life. The ESS is available for the HDS 100, HDS 200, and HDS 300 systems. It is also compatible with legacy TB-08 systems for retrofits and upgrades.

Features

- Lithium-iron-phosphate technology
- Lower weight
- Individual modules easily replaced if needed
- Ambient air-cooled
- Supports full electric accessories
- Supports Stop/ Start Drive, Depot Drive, and Quiet Drive operating modes
- Cold-weather kit option for operation below 14°F (-10°C)

Benefits

- Maximizes regenerative energy recovery to improve fuel economy
- Improved safety through the use of nano-iron-phosphate technology
- Longer battery life decreases total lifecycle cost
- Path to zero-emission technology
- Improved reliability and performance
- ESS is equipped with 16 individual modules capable of providing bus operation if one module fails

HybridDrive Energy Storage System
(lithium-ion)

Ratings

- Peak design power: ± 200 kW
- Operational power limits: $+170$ kW (regen), -130 kW (motoring)
- DC bus output voltage: $500 - 750$ Vdc (635 Vdc nominal)
- Operating temperature: -40°F to 125°F (-40°C to 52°C)
- Cold-weather kit required below 14°F (-10°C)

Size

- Height: 12 inches (303 mm)
- Width: 41 inches (1,041 mm)
- Length: 84 inches (2,135 mm)
- Weight: 800 lbs (363 kg), $+50$ lb ($+23$ kg) with cold-weather option

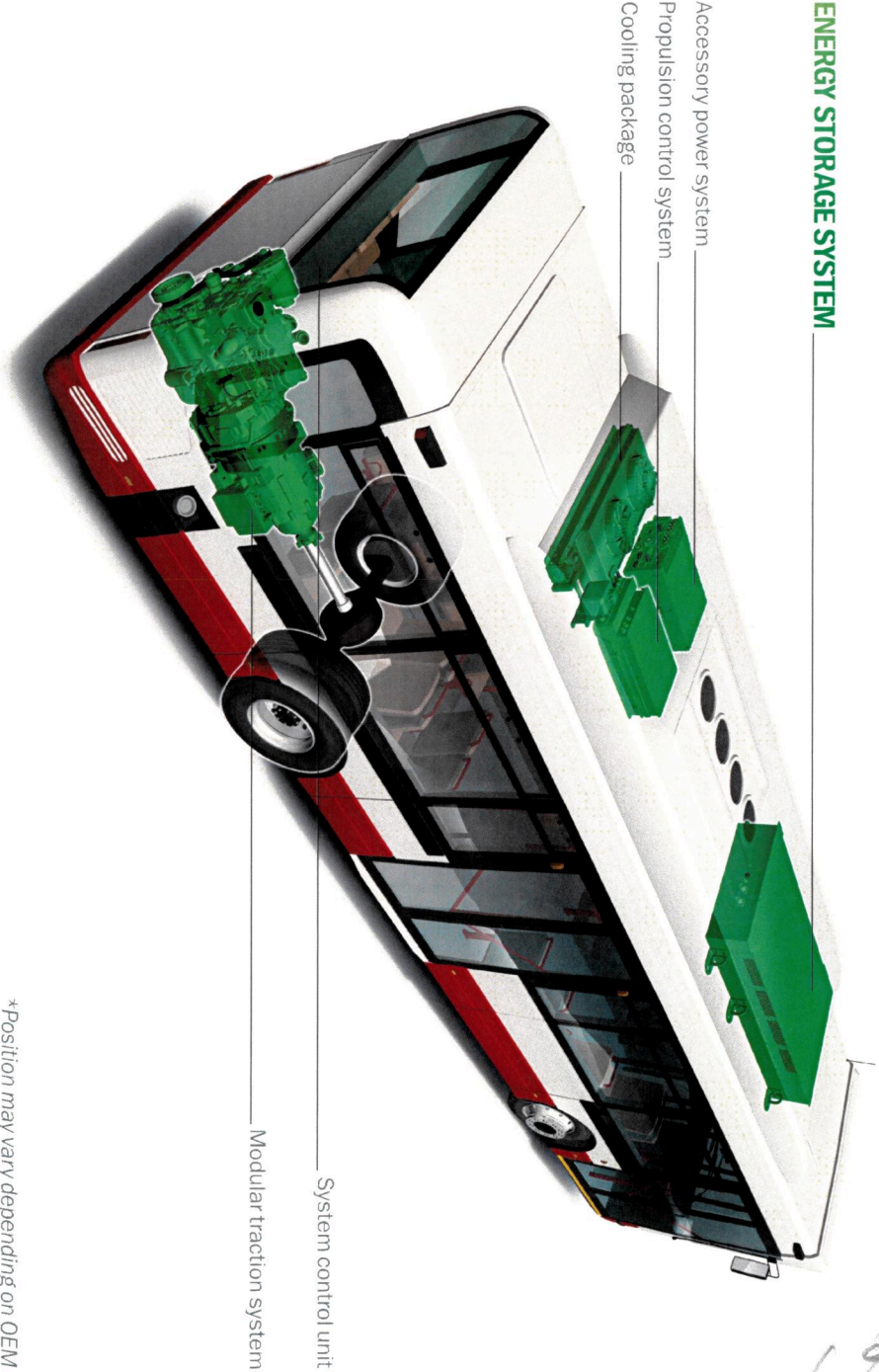
Cooling

- Forced ambient air
- Provided by dual-integrated variable speed fans

HybridDrive propulsion system components are sold as part of our HDS family of products and are available through BAE Systems qualified OEMs. Components are not sold separately.

BAE Systems
1098 Clark Street
Endicott, NY 13760
BAE Systems
Marconi Way
Rochester Kent ME1 2XX
www.hybridrive.com

ENERGY STORAGE SYSTEM



*Position may vary depending on OEM

This document gives only a general description of products and services and except where expressly provided otherwise shall not form part of any contract. From time to time, changes may be made in the products or conditions of supply.
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TTY Relay: 711



31794-1132-

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 Safety & Health General Information 12:27:34

578037394 KING COUNTY SI: Y STAT: 0 TYPE: X ACCT: 700,101-00

* Business Information Inactive:
 DBA: KING COUNTY Busloc/Aka: * Legal Owner: 0
 Mail: 500 4TH AVE SUITE 500 Expr Fctr: Cmpt Expr:
 Addr: * SEATTLE, WA 98104 Ownership: Cnt/City BM NAICS: 921110 *
 Cont: MERRITT, LAURA Phone: 206 477-3362 SIC: 9111
 Num Pls: 184 *
 Claims 1 Year * Range 05/07/2015 - 05/07/2016 Cnt 1,005 Costs 503,636
 by UBI/ 3 * 05/07/2013 - 05/07/2016 3,054 6,808,632
 Account 5 * 05/07/2011 - 05/07/2016 5,278 17,513,699

* S&H Inspection Data Num: 162

Note: use WIN for Inspection data with open
 conference dates newer than JULY 1, 1997

Note: use WIN for ALL Consultation history

* S&H Variance Data: Yes

Enter-PF1---PF2---PF3---PF4---PF5---PF6---PF7---PF8---PF9---PF10---PF11---PF12---
 Help More Retrn Rstrt Exit