



**Technical Briefing –  
New phase of qualification testing for AZUR on the STM's  
network**

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Société de transport de Montréal**

# INTRODUCTION OF EXPERTS

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# LATEST UPDATE ON AZUR

- A second train, fully furnished was delivered and assembled
- Qualification testing to continue: AZUR will now be tested on the network during operating hours
- A key phase that will stretch over several months



# TIMELINE

- April 28, 2014: delivery of the first AZUR car
- May 2014: first nine-car prototype train assembled in Youville maintenance shop
- May 2014: static tests performed in STM maintenance shop
- May and June 2014: track clearance validation through the complete network
- May 2014 : first dynamic tests on STM test track
- June 2014: first dynamic tests on STM network at night
- August 2014: first dynamic tests along an entire line at night
- July 2015: the second train (furbished) is assembled in STM maintenance shop

# HUNDREDS OF TESTS ALREADY PERFORMED

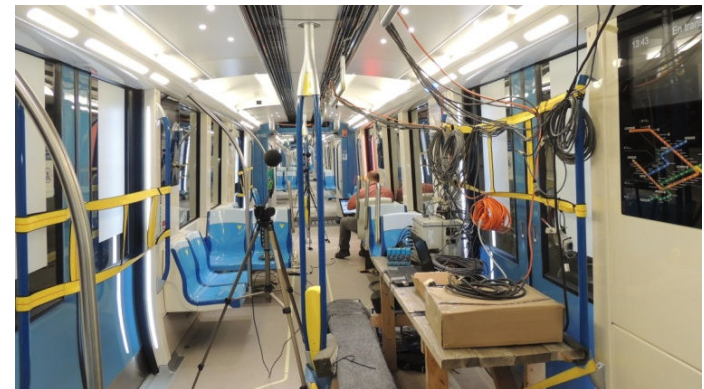


- Factory testing at Bombardier, Alstom and their subcontractors: over 300 tests
- On the test track at La Pocatière: over 150 tests
- At the Ateliers Youville shops (STM): over 150 tests
- In STM's tunnels: over 300 dynamic test blocks



# INTELLIGENT SYSTEMS UNDERGO ADVANCED TESTING

- AZUR has 7 intelligent systems:
  - Train operation and monitoring system
  - Propulsion and braking system
  - Communication system
  - Door system
  - Ventilation
  - Auxiliary power system
  - Train control
- Hundreds of tests to be performed
- Several validation steps required for software-controlled systems



# UPDATE ON TRAIN CONTROL SOFTWARE



- Software versions available so far only allowed for train operations at night
- Today: the software version of the train control system allows the train to run during operating hours on the network



# NEW PHASE: TESTING DURING OPERATING HOURS

- Some sixty qualification tests are left to complete
- Objective: validate AZUR's performance in its actual operating environment
- At the same time, testing at night continues





# STEP 1: TESTING WITHOUT PASSENGERS DURING OPERATING HOURS



- From mid-August to the end of 2015
- During off-peak periods
- Mostly on the Orange and Blue lines
- Two trains will be operating: the prototype train and the second, fully equipped train

# STEP 1: TYPICAL TESTS TO PERFORM

Mainly:

- Automatic train control tests and fine tuning
- Ride quality tests
- Propulsion system temperature tests
- Differential axles heat generation test
- Communications system tests



# STEP 1: POTENTIAL IMPACT ON SERVICE



- AZUR is currently undergoing testing
- Service disruptions are to be expected
- The STM is taking all steps to limit impact




## STEP 2: DRY RUN TESTING

- AZUR goes into operational simulation mode without passengers
- 5 days scheduled in December 2015
- Service simulation tests
- Final validation prior to going into passenger service

## STEP 3: AZUR IN REVENUE SERV



- Steps 1 and 2 must be completed on the Orange line
- Expected by the end of 2015
- Gradually to test reliability
- Two-month period minimum
- Step 3 must be completed to initiate acceptance process of following trains



**There is still work to do  
and tests to perform, but  
we are so very close!**



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