

Preliminary Review September 29, 2011 Lightning Strike at Jamaica

**Meeting of the Metro-North and Long Island Committees
October 24, 2011**



Overview: 9/29/11 Service Disruption

- The lightning strike at 4:37 pm on September 29, 2011 led to two separate catastrophic shutdowns of our train service and long delays for our customers.
- The lightning strike initially disabled the Jay signal system controlling train service west of Jamaica. Train service from City Terminals to Jamaica was suspended.
- LIRR implemented the Jamaica Emergency Action Plan which included the “E” train diversion and train service from Jamaica east.
- Limited service was restored from City terminals on dedicated routes.
- While troubleshooting the Jay signal system, a programming error occurred which disabled the Hall signal system controlling train service east of Jamaica.
 - ❑ On an evening when customers had already experienced extended delays on their commute home, many customers faced further prolonged delays with the loss of the Hall signal system.
 - ❑ Additionally, the loss of third rail power due to police activity related to self evacuations and the time it took to alleviate train congestion at Jamaica resulted in further delays.
 - ❑ At 8:05 pm, there were 17 stranded trains and 9 standing trains. LIRR also cancelled trains and suspended service at City terminals.
- The recovery from the second catastrophic shutdown was further complicated by trains that had been staged in Jamaica to accommodate “E” train customers.
- During the service disruption, 84 customer email alerts, 80 Tweets, 26 message board postings, 18 web page updates and 19 Facebook postings were issued. Additionally 50 text messages were sent to crews onboard trains.
- After Hall signal system was restored and congestion at Jamaica was alleviated, train service from City terminals resumed at approximately midnight.
- Normal AM peak service was provided on Friday, September 30, 2011.

Operational Objectives During the 9/29/11 Service Disruption

1

Redirecting Train Movement and Ensuring Customer Safety

- Ensure the safety of customers and employees.
- Protect rolling stock and other fixed assets.
- Provide alternative train service (if possible.)
- Mitigate impacts on customers on stranded trains and care for customers in need.
- Maintain orderly access to stations.

2

Communicating with Customers

- Provide customers with accurate, timely and regular service updates.
- Utilize a wide range of methods to communicate with customers (Twitter, e-mail alerts, website, Facebook, etc.)
- Deploy LIRR employees to key locations to provide information and guidance.
- Offer information on alternative services.

3

Restoring Signal System

- Identify and assess scope of problem.
- Formulate and execute plans for remediating problem.
- Develop alternative infrastructure strategies.
- Ensure the integrity of infrastructure.

Meeting Operational Objectives

1

Redirecting Train Movement and Ensuring Customer Safety

Operational Objectives:

- Provide safe and comfortable environments for customers and employees.
- Protect rolling stock and other fixed assets.
- Provide alternative train service (if possible.)
- Mitigate impacts on customers on stranded trains and care for customers in need.
- Maintain orderly access to stations.

- Service suspended between City terminals and Jamaica due to lightning strike and loss of Jay signal system. Wherever possible, trains pulled to stations to offload customers. Reverse moves to City terminals identified and ordered. Buses requested.
- Movement Bureau activated Customer Advocate position. Advocate implemented train crew communications protocol to ensure train crews on standing and stranded trains received information, made frequent announcements, and reported customer related conditions on the trains.
- MTA Police restricted access to Penn Station.
- 3 eastbound and 2 westbound dedicated routes identified for blocking and spiking by signal work force.
- Implemented Jamaica Emergency Action Plan which includes “E” train diversion and NYCT cross-honoring LIRR tickets. Westbound service terminated at Jamaica. Trains held at Jamaica for eastbound service for customers who arrived by the “E” train. Police and staffing resources activated to manage customer flow at Jamaica Station.
- While Jamaica east operation was underway, limited train service resumed from City terminals on dedicated routes.

1

Redirecting Train Movement and Ensuring Customer Safety

Operational Objectives:

- Provide safe and comfortable environments for customers and employees.
- Protect rolling stock and other fixed assets.
- Provide alternative train service (if possible.)
- Mitigate impacts on customers on stranded trains and care for customers in need.
- Maintain orderly access to stations.

- Service suspended again with loss of Hall signal system. Wherever possible, trains pulled to stations to accommodate customers. 17 trains became stranded.
- MTA Police investigated report of self evacuation in Hall. Third rail power turned off, precluding movement of standing and stranded trains. Police notified and responded to stranded trains as needed. NYPD, FDNY, EMS, and MTA Bus contacted for Jamaica Station emergency response. Emergency services assisted two customers onboard stranded trains and one was removed.
- 3 westbound and 3 eastbound dedicated routes at Hall identified for blocking and spiking. Third rail power restored after police and crews reported tracks clear, one hour after power turned off. Plan to clear standing and stranded trains implemented based on train locations once power restored. Conducted train-to-train evacuation of stranded trains at Jamaica Station and in Kew Gardens.
- Once Hall signal system was restored, plan to clear standing and stranded trains revised and accelerated.
- Train service restored from City terminals.
- NYPD, FDNY, EMS, and MTA Bus notified to stand down.
- The lightning strike resulted in 169 trains cancelled, 45 terminated, and 35 late for a total of 249 affected trains on 9/29. The PM OTP was 12.7%, 62.75% for the day.
- Regular service restored for Friday AM rush.

1

Redirecting Train Movement and Ensuring Customer Safety

ISSUES

Lengthy delays impact customer safety and comfort, especially when there are stranded trains and a risk of self evacuation.

Marshaling sufficient police and staffing resources in Jamaica to handle large crowds during a rapidly evolving event is difficult.

CORRECTIVE ACTIONS

In progress:

- Improve coordination with NYPD, FDNY, and other Emergency Responders during multiple stranded train incidents.
- Assess additional strategies to discourage self evacuations.
- Develop program for delivering water to customers on board stranded trains.

Taken to date:

- MTA PD met with the NYPD Local Command and discussed improvements in notification and deployment.

In progress:

- Improve deployment and utilization of Customer Assistance Program managers.

1

Redirecting Train Movement and Ensuring Customer Safety

ISSUES

Jamaica Station and the surrounding streets are not suited to accommodate large crowds or increased vehicular traffic. During significant service disruptions, there is excessive noise at street level making it difficult to communicate with customers.

There is limited flexibility to provide train service when the signal system fails, especially at Jamaica and other key locations.

CORRECTIVE ACTIONS

Taken to date:

- Developed a plan to give customers eastbound bus route information to relieve overcrowding at Jamaica.

In progress:

- Improve existing emergency bus plan in Jamaica.
- Assess feasibility of establishing automobile pick-up and drop-off locations near Jamaica Station.
- Examine ways to improve the quality of announcements at street level in Jamaica.

In progress:

- Investigate feasibility of utilizing a secondary indication system associated with the new Jamaica signal system to provide status of switches, expediting ability to provide some train service.
- Review authorization process to expedite train movement during signal outages.

1

Redirecting Train Movement and Ensuring Customer Safety

ISSUES

Port Washington Branch customers experience difficulty entering Penn Station, even though service along the branch continues during certain service disruptions.

CORRECTIVE ACTIONS

In progress:

- Develop a protocol to designate an entrance for customers at Penn Station who wish to utilize the Port Washington Branch during service disruptions when service on the Port Washington Branch is unaffected.

Meeting Operational Objectives

2

Communicating with Customers

Operational Objectives:

- Provide customers with accurate, timely and regular service updates.
- Utilize a wide range of methods to communicate with customers (Twitter, email alerts, website, Facebook, etc.).
- Deploy LIRR employees to key locations to provide information and guidance.
- Offer information on alternative services.

- Following lightning strike, LIRR implemented its emergency customer communication plan.
- Additional Public Affairs and Transportation staff reported to the Public Information Office to assist with customer emails, traffic reporting, web updates, message boards, Twitter, and crew communications.
- Customer Assistance Program managers were promptly deployed to Jamaica and Penn Station.
- Public Affairs staff requested Madison Square Garden personnel as per a prior agreement to activate the MSG marquee sign on 7th Avenue to alert LIRR customers that service had been suspended.
- LIRR Public Affairs worked with MTA Press office to keep the media and the public informed throughout the incident, including dispatching press officer to Penn and conducting live street interviews with electronic and print reporters in Jamaica on Thursday evening and Friday morning.
- Travel Information Center staff held to handle increased call volume during the disruption and TIC hours were extended until midnight.
- During the service disruption, 84 customer email alerts, 80 Tweets, 26 message board postings, 18 web page updates and 19 Facebook postings were issued. Additionally 50 text messages were sent to crews onboard trains.

Communicating with Customers

ISSUES

Ability to provide customers with timely and accurate information during a rapidly evolving event.

CORRECTIVE ACTIONS

In progress:

- The Public Information Office is being expanded with additional staff and equipment, and is scheduled to open in a new location by mid November. All customer communications will be coordinated from a single command center.
- New GPS data onboard trains will improve level of data for electronic signs and announcements.
- Evaluate onboard and station announcements strategy during lengthy or indefinite delays with special attention to people on stranded trains.
- Real Time mobile phone application being tested to provide customers with detailed service status information (similar to countdown clocks) on hand held smart phones, laptops, I-Pads and desktop computers.
- LIRR's Pledge to Riders will outline its core customer values, including what customers have a right to expect during a service disruption. This document will be prominently displayed onboard trains, at stations and on the mta.info website.

DRAFT LIRR PLEDGE TO CUSTOMERS

LIRR is dedicated to delivering safe and reliable transportation. Our highest priority is to ensure customer safety and this pledge is always subject to that paramount concern:

1. A Safe, Reliable Ride – Our top priority is to provide transportation that gets customers to their destination safely, comfortably and on time.
 2. Accurate and Timely Information - We will provide accurate, timely and meaningful information on service conditions, including via email alerts, mta.info, news, station, platform and onboard announcements to keep customers informed and allow them to plan their trips wherever they are.
 3. Courteous Employees – LIRR crews and other employees will be helpful and courteous at all times and will provide accurate and timely information to customers. Our goal is to provide excellent service.
 4. A Clean Environment – We will maintain a clean environment for our customers and the communities we serve, including at stations, restrooms and along our right-of-way.

When service is disrupted, customers can expect us to respond quickly and customer safety will remain our No. 1 concern:
 5. Alternative Transportation - We will make every effort to stop trains at stations and open the doors to allow customers to seek alternate transportation and will provide customers with information concerning alternate routes and means of transportation. If scheduled LIRR service is not available, we will make every effort to provide customers with emergency bus service when possible.
 6. Comfort - If a significant incident occurs that prevents us from bringing a train to a station, we will move immediately to assist affected customers. Emergency personnel will be dispatched to offer medical assistance and efforts will be made to provide water. If efforts to move the train are unsuccessful, customers will be evacuated safely. We will also coordinate with emergency personnel and other transportation agencies to ensure safe conditions during service disruptions. To facilitate these efforts, it is essential that customers listen for crew announcements and never leave a stranded train unless under the supervision of the train crew or rescue personnel.
 7. Weather Emergency Notification - If it becomes necessary to temporarily suspend service when extreme weather is forecast or when snow accumulations are expected between 10-13 inches, we will use all our communication means so customers can "know before you go."
 8. Severe Service Disruption Procedures – Customers will be given updated information regarding service restoration, including estimates of the time until service resumes. Onboard personnel will walk through trains regularly and provide accurate and timely information to customers. Comfort trains will be provided for customers stranded at Penn Station.
- If you are not satisfied with the level of service you have received from the LIRR, email us at mta.info and let us know.*

2

Communicating with Customers

ISSUES

Customers required additional information about alternative transportation options.

CORRECTIVE ACTIONS

In progress:

- Detailed campaign being developed to give customers information about existing alternative bus and subway routes to points east on Long Island.
- Maps and other literature being created to better assist customers when they arrive in Jamaica so they are aware in advance where to assemble for bus service to the North and South shores and for points on Main Line.

Meeting Operational Objectives

3

Restoring Signal System

Operational Objectives:

- Identify and assess scope of problem.
- Formulate and execute plans for remediating problem.
- Develop alternative infrastructure strategies.
- Ensure the integrity of infrastructure.

- Immediately after lightning strike, dispatched troubleshooting teams to Jay signal hut to gain local control.
- Used computer based diagnostic tools to identify problem. The tools erroneously indicated the CPUs were working.
- Signal forces block and spike 3 eastbound and 2 westbound dedicated routes in Jay interlocking.
- While attempting to restore Jay signal system, programming error results in loss of Hall signal system east of Jamaica.
- Programming error identified and corrected. Hall signal restored.
- Overnight, Jay CPUs identified as the components damaged by lightning. CPUs replaced. Jay system restored.

Restoring Signal System

ISSUES

While the system was designed with extensive lightning/surge protection, the lightning/surge protection did not prevent some signal apparatus located in the signal hut from receiving excessive voltage and totally shutting down the system.

The isolation between the A (primary) system and B (secondary) system did not protect the CPU cards in the B system.

CORRECTIVE ACTIONS

Taken to date:

- Ansaldo has commenced a failure analysis, which will be used to develop potential improvements.
- LIRR is performing a Peer Review with NYCT and MNR to discuss lightning and surge protection best practices.
- Systra is benchmarking additional alternative lightning/surge protection technologies.

In progress:

- LIRR working with Ansaldo and Systra to evaluate improvements for isolating the A and B systems.

3

Restoring Signal System

ISSUES

LIRR Engineering staff encountered unexpected roadblocks when attempting to diagnose the failure of the Jay Signal System and to correct the problems. Among the reasons were inadequacy of the diagnostics, which did not indicate that a portion of each of the CPU cards was not functioning properly, and the absence of sufficient troubleshooting information in the manuals and training curriculum.

There was an error when the Hall Signal Hut B system was reprogrammed for use in the Jay Signal Hut.

CORRECTIVE ACTIONS

Taken to date:

- Spare equipment has been purchased and pre-programmed for Jay and Hall Signal Huts.
- Spares for other nine signal huts with Ansaldo microprocessors are on order.

In progress:

- LIRR is working with Ansaldo and Systra to improve diagnostics.
- LIRR working with Ansaldo and Systra to improve troubleshooting training and manuals.

Taken to date:

- Quality Assurance procedures with respect to reprogramming the signal system software have been developed and are in place.

Operational Objectives During the 9/29/11 Service Disruption

1

Redirecting Train Movement and Ensuring Customer Safety

2

Communicating with Customers

3

Restoring Signal System

Long Island Rail Road will continue its efforts to investigate the causes of the September 29, 2011 service disruption and implement corrective actions.

Appendix I

Lightning Strike at Jamaica

Chronology of Major Events (09/29/2011 – 09/30/2011)

4:37 pm – 5:00 pm

- Lightning strikes key signal hut (Jay) in the largest switching point in the LIRR (4:37 pm) and lost ability to control Jay Breaker House
- All service is suspended between City terminals and Jamaica.
- Order is issued to hold all westbound trains at Jamaica for use on eastbound service.
- Status of Train Service Enroute EB and WB at 5:00 pm between Jamaica vicinity and City terminals:
 - 7 Standing
 - 8 Stranded
 - 5 trains reversed to stations
 - Port Washington branch service continues.
- PIO issues first customer email alert advising of temporary suspension.

5:00 pm – 6:00 pm

- MTA PD closes some Penn Station entrances to address crowd control.
- LIRR begins to manually set switches (blocking and spiking) to allow limited service to resume.
- Trouble shooting begins at Jay signal hut.
- Advisory is issued to customers to take the “E” Train to Jamaica as an alternate service.
- Status of Train Service Enroute EB and WB at 6:00 pm between Jamaica vicinity and City terminals:
 - 2 Standing
 - 3 Stranded
 - 1 Proceeds east through Jamaica
 - 5 Proceed west to Jamaica
 - 5 Originating in Jamaica proceed east
 - Port Washington branch service continues (4 trains operated, 3 cancelled). WB trains discharging customers at Woodside.
- PIO activates emergency customer communication strategy that includes media outreach, station and on-board announcements, web and message board updates, email alerts and Twitter. All communications advise customers to expect significant delays.

Appendix I

Lightning Strike at Jamaica

Chronology of Major Events (09/29/2011 – 09/30/2011)

6:00 pm – 7:00 pm

- A significant number of passengers begin to arrive in Jamaica on “E” train.
- LIRR completes manual switch (block and spike) alignment to allow for limited service west of Jamaica.
- Troubleshooting continues at Jay signal hut.
- Status of Train Service Enroute EB and WB at 7:00 pm between Jamaica vicinity and City terminals:
 - 0 Standing
 - 0 Stranded
 - 3 Proceed east through Jamaica
 - 2 Proceed west through Jamaica
 - 8 Originating in Jamaica proceeding east
 - EB hourly service to Port Washington continues. WB trains terminate at Woodside.
- Emergency customer communications continues. Customers are advised about restoration of limited eastbound service from City terminals.

7:00 pm – 8:00 pm

- Troubleshooting continues at Jay signal hut.
- Status of Train Service Enroute EB and WB at 8:00 pm between Jamaica vicinity and City terminals:
 - 0 Standing
 - 0 Stranded
 - 7 Originating in Jamaica proceeding east
 - EB hourly service to Port Washington continues. WB service resumes to NY.
- Emergency buses mobilize to provide continuing service from Huntington and Ronkonkoma to points east.
- Customer and media updates continue.

Appendix I

Lightning Strike at Jamaica

Chronology of Major Events (09/29/2011 – 09/30/2011)

8:00 pm – 9:00 pm

- Second key signal system (Hall) fails and halts service east of Jamaica.
- Service is suspended between City terminals and Jamaica.
- First report of self-evacuation is received.
- Request to remove all third rail power in Jamaica (all power is removed at 8:44 pm from Jamaica to Kew Gardens due to Jay Breaker).
- Status of Train Service Enroute EB and WB at 9:00 pm between Jamaica vicinity and City terminals:
 - 9 Standing
 - 1 train reversed to Atlantic Terminal
 - 17 Stranded
 - 1 Originating in Jamaica proceeds east
 - EB hourly service Port Washington branch service continues.
- PIO re-issues notifications to customers and media that service is suspended; message is revised later advising customers to seek alternate means of transportation.

9:00 pm – 10:00 pm

- Service remains suspended between City terminals and Jamaica.
- LIRR begins to manually set switches (blocking and spiking) in Hall allowing limited service to resume.
- Restoration of third rail power begins in Jamaica and is completed by 9:30 pm.
- MTA Bus and emergency personnel are notified and begin reporting to Jamaica.
- Status of Train Service Enroute EB and WB at 10:00 pm between Jamaica vicinity and City terminals:
 - 8 Standing
 - 12 Stranded
 - 7 trains reversed to stations
 - 1 Originating in Jamaica proceeds east
 - Resume normal service on Port Washington branch
- PIO and MTA Press Office inform customers and media that service remains suspended. Customers are advised to seek alternate means of transportation.

Appendix I

Lightning Strike at Jamaica

Chronology of Major Events (09/29/2011 – 09/30/2011)

10:00 pm – 12:00 am

- JCC resumes control of Hall Interlocking (10:00 pm).
- Manually set switch controls (blocks & spikes) in Hall are removed.
- Full control of Hall is restored (10:43 pm).
- Limited service through Jamaica is resumed (11:30 pm).
- Status of Train Service Enroute EB and WB at midnight between Jamaica vicinity and City terminals:
 - 0 Standing
 - 0 Stranded
 - 7 trains reverse to stations
 - 10 Proceed east through Jamaica
 - 3 Proceed west through Jamaica
 - 2 Originating in Jamaica proceed east
- Emergency Personnel are notified of trains moving.
- PIO and MTA Press Office advise customers and media of restoration of limited eastbound service.

12:00 am – 3:30 am

- Six CPUs (primary system) are replaced in Jay signal hut.
- JCC resumes control of Jay Interlocking (3:20 am).
- Normal service resumes at 3:30 am.

3:30 am – 5:00 am

- Manually set switch controls (blocks & spikes) in Jay are removed.
- PIO notifies customers that LIRR expects to operate a near normal Friday am rush (4:48 am).

APPENDIX II

LOCATION OF STANDING AND STRANDED TRAINS AFTER HALL SIGNAL SHUTDOWN

