

MONTHLY MONITORING REPORT

World Trade Center Port Authority Trans-Hudson Terminal
PORT AUTHORITY OF NEW YORK AND NEW JERSEY
New York, New York

March 2015



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Cover: Setting of curtain wall glass panels commenced on the south side of the oculus structure on March 15, 2015.

DISCLAIMER

This report and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This report should not be relied upon by any party, except the FTA or the project sponsor, in accordance with the purposes as described below.

For projects funded through FTA's Lower Manhattan Recovery program, the FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a project sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a sponsor may take to mitigate the risks to project costs, budget, and schedule, or the strategy a sponsor may develop for project execution.

Therefore, the information in the monthly reports may change from month to month, based on relevant factors for the month and/or previous months.

REPORT FORMAT AND FOCUS

This monthly report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60-14-D-00010, Task Order No. 006. Its purpose is to provide information and data to assist the FTA in continually monitoring the grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether or not the grantee continues to receive federal funds for project development.

This report covers the project management activities on the Permanent World Trade Center (WTC) Port Authority Trans-Hudson (PATH) Terminal (Hub) project, conducted by the Port Authority of New York and New Jersey (PANYNJ) as grantee and funded by the FTA's Lower Manhattan Recovery Office (LMRO).

EXECUTIVE SUMMARY

During March, the placement of the oculus curtain wall panels commenced with the first of nearly 800 glass panels set in place on March 15, 2015. Also during March, the hanging scaffold system that spans the entire length of the oculus skylight opening, was completed and certified as ready for use. Warmer weather conditions at the end of the month allowed the resumption of painting of the oculus steel as well.

At the PATH Hall, World Trade Center Construction (WTCC) had intended to place the new Platform B into revenue service; however, this was not accomplished. WTCC's new forecast for that opening is early May 2015. However, the installation of stone flooring at the platform and mezzanine levels moved forward during March, and surpassed the halfway mark at both levels. In-house PATH track personnel also made progress on Tracks 2 and 3 during the month.

Project Description

The WTC PATH Hub Terminal serves the PATH electrified rail transit system in Lower Manhattan. The PATH Hub is an extensive underground complex of pedestrian corridors and train station facilities that will replace the original WTC PATH Terminal destroyed by terrorist attack on September 11, 2001.

Construction Agreement (CA)

The CA was signed by the LMRO on April 25, 2006. A Revised and Restated Construction Agreement (RRCA) was executed on September 18, 2012. The RRCA establishes a Required Completion Date (RCD) of December 17, 2015, and commits \$2.872 billion in federal funding to the PATH Hub project. The RRCA establishes a not-to-exceed amount of \$3.995 billion for the project. Recovery Plan 02 was *approved* in early 2014 and established an updated RCD of December 31, 2016.

Quarterly Progress Review Meeting (QPRM)

A QPRM for the first quarter of 2015 is being planned for late May 2015.

Design Activity

The designer continues to provide construction support services, including the review of contractor shop drawings and other submittals.

Procurement Activity

WTCC has completed all planned procurements for the PATH Hub project. However, change orders continue to be issued as necessary under the active construction contracts.

Construction Activity

During March, oculus curtain wall glass panel installation commenced on the south side of the oculus, marking a significant project milestone. Also at the oculus, the heat-straightening of rafter elements was performed with satisfactory re-spacing of four rafters accomplished. Improved weather conditions and warmer temperatures also allowed the resumption of oculus painting work towards the end of the month. At Platform B, WTCC's intention of opening that platform to revenue service by the end of the month was not achieved, although substantial progress toward that objective was made during the month. Stone installation at the platform and mezzanine levels significantly advanced, as did the track-level work by PATH track personnel. Low-voltage work and vertical circulation elements also moved toward completion, although most commissioning activities were deferred pending the completion of the installation of major life safety and other platform and mezzanine support systems. Other project issues that were being addressed during March included the continuing effort to place the new Emergency Generator Plant into service and development of plans to provide cooling capability to back-of-house equipment rooms that are already in service. At the generator plant, a number of corrective measures were being implemented during March, including the cleaning of the fuel delivery system. Chilled water delivery from either the Emergency Chiller Plant or via the two temporary 20-inch chilled water lines provided by Retail is targeted to be in place by May 2015, although a preferred option had not been selected by the end of March.

Schedule

In March 2015, WTCC released Integrated Master Schedule (IMS) 78 (with a data date of February 1, 2015), (b) (4)

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

Cost Data

WTCC submitted its monthly cost model revision on March 31, 2015. It shows that, based on the contract awards and estimates through January 31, 2015, WTCC's Estimate at Completion (EAC) for the federally funded PATH Hub project is just over \$3.08 billion, or 82.7 percent of the EAC. That total includes a reduction of \$2.5 million in PATH Hub expenditures below the total contained in the January 31, 2015 report. The net reduction of \$2.5 million in expenditures

is principally due to excessive accruals resulting in over-reporting of actual costs in prior periods. WTCC anticipates correcting this in the February 2015 report.

Risk Management

To provide an improved project risk tool, the FTA, the PMOC, and WTCC completed the Project Execution Plan (PEP) in conjunction with the execution of the RRCA on September 18, 2012. As information on the impacts of Hurricane Sandy (which occurred at the end of October 2012) became available, the PMOC conducted PEP workshops in June 2013 to discuss and quantify the impacts to cost and schedule from the storm. The PMOC then reconciled the results of the workshops with WTCC, and the outcome of this effort was used to update the PEP. The PEP was finalized in February 2014 and recognized WTCC's eligibility for receiving partial release of risk retainage by achieving beneficial use of Platform A on February 25, 2014. In July of 2014, the PMOC initiated a review of the 2013 PEP update in consideration of various project developments that had arisen during the intervening period. In August of 2014, the PMOC updated the contingency drawdown curve to reflect the evaluation of the project's residual risks and the potential risk retainage release amounts associated with each of the remaining PEP milestones. During October 2014, the PEP exhibits were finalized, and the PMOC, through the FTA, issued a spot report reflecting those updates to WTCC. During January 2015, the PEP milestone defined as "oculus steel erection complete" was achieved, triggering the initiation of an additional partial release of risk retainage. Top risk drivers are mentioned within the body of the monitoring report, below.

Technical Capacity and Capability Review (TCCR)

The TCCR will be updated as necessary in conjunction with the update of the PEP.

Project Management Plan (PMP)

The grantee updated its PMP and submitted version 6.0 of the plan in early August 2014. *The PMOC transmitted its draft spot report on the PMP update to the FTA during March 2015.*

Project Quality Assurance (QA)

During *March 2015*, WTCC QA completed *five* oversight audits that included reviewing the Construction Manager (CM) QA's field audits and performing its own field construction audits. The *March 2015* audit total reflects the *five* WTCC QA audit reports that were issued and received at the time this monthly report was drafted. No quality issues were identified for corrective action.

Site Safety

The WTC PATH Hub project has established its own project safety performance goals for Total Case Incident Rate (TCIR) and Lost-Time Incident Rate (LTIR) of less than 5.0 and less than 2.0, respectively. In February 2015, the project had no recordable incidents and no lost-time incidents, resulting in a TCIR of 0.00 and an LTIR of 0.00, based on 127,901.3 hours worked. In January 2015 there were also no recordable incidents and no lost-time incidents, resulting in a TCIR of 0.00 and an LTIR of 0.00, based on 134,288.3 hours worked. Maintaining both a zero TCIR and a zero LTIR from January 2015 through February 2015 represents a significant effort by the WTCC Safety team and site workers. Ongoing *March* safety initiatives are discussed in

the project monitoring section of this report. The *March* 2015 safety data for the project was not fully available at the time this report was drafted but is expected to be available after mid-April 2015. *In March 2015, the installation of hanging platforms that are suspended from the oculus roof began; these platforms will be used to install glass panels in the oculus roof. In addition, large boom lifts are being used to support the glass installation effort. Due to the extensive overhead work, some near-miss incidents occurred with objects falling to the 274' elevation. As a result, WTCC Safety created a Controlled Access Zone (CAZ) area at the 274' elevation to section off the areas where work is going on overhead.*

Issues/Problems/Suggestions

(b) (4)

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MONITORING REPORT

A. Project Description

The PATH Hub facility is an intermodal terminal serving the PATH electrified heavy rail transit system, which has a total of 13 PATH stations in New York and New Jersey. When completed, the PATH Hub will connect to 11 New York City Transit (NYCT) subway lines in Lower Manhattan. The PATH Hub will include a platform level, associated mezzanine and concourse levels called the PATH Hall, and a terminal building called the Transit Hall, or oculus, with north-south and east-west pedestrian connections to the NYCT subways, the World Financial Center, and WTC above-grade site development. It will be a permanent replacement of the original WTC PATH Terminal complex destroyed by the terrorist attack on September 11, 2001.

B. Project Status

Construction Agreement

The CA was signed on April 25, 2006. An RRCA was executed on September 18, 2012. The RRCA established an RCD of December 17, 2015, and commits \$2.872 billion in federal funding to the PATH Hub project. It also includes an FTA-allowable not-to-exceed amount of \$3.995 billion. The FTA approved WTCC's February 18, 2014 Recovery Plan 02, thereby establishing a revised RCD of December 31, 2016. Also included in the Recovery Plan was a change in WTCC's forecasted substantial completion date to December 31, 2015. *WTCC initially submitted its draft Recovery Plan 03 in February 2015, and revised and resubmitted it as a draft in March 2015.*

Quarterly Progress Review Meeting

A QPRM for the first quarter of 2015 is being planned for late May 2015.

WTC Site Master Plan

WTCC's current site master plan is Master Plan Version 11, dated October 10, 2013.

Environmental Compliance

(Reported on separately by FTA's LMRO.)

Design Support During Construction

The designer continued providing post-award design support services for the PATH Hub construction, including responding to contractor Requests for Information (RFIs) and providing design certifications for completed elements of construction. The designer also continues to prepare and issue addenda that incorporate multiple, issued RFI responses in which the designer authorized changes to the base design documents that bring those documents into conformance with the RFI responses. Contractor RFIs are tracked by the CM for each of the prime contractors working on the project. The CM, in concert with WTCC, then prioritizes the order in which

those RFIs are answered by the designer based on their relative importance in advancing project work.

Construction Status

Oculus Steel: During March, the primary activities of the oculus steel contractor were the heat-straightening of a small group of rafter elements and the completion of the welding of the shell plates at the east and west abutments. A total of four rafters were straightened, three on the north side of the oculus and one on the south side, and satisfactory spacing of those rafters was restored, thereby completing the heat-straightening work. The remaining work of the oculus steel contractor includes change order work, as well as outstanding punchlist work including punchlist work related to some of the completed welding activities. During late March, with the onset of more moderate weather conditions, the oculus steel contractor resumed the restoration of the coatings at the oculus steel surfaces that had been compromised by the attachment of temporary lifting devices and scaffold supports. Restoration work was ongoing at the end of the month and included the localized application of primer paint and, in the case of the rafters, the localized application of both primer and finish paint, following appropriate surface preparation. It should also be noted that the remainder of the finish painting of the entire oculus steel structure, which is the majority of the oculus steel painting work, also resumed during late March under a separate prime painting contract.

Oculus Glass: On March 15, the oculus glass contractor commenced the setting of glass panels at the centerline of the south side of the oculus structure. By the end of the month a total of 46 glass panels had been set in position filling 5 bays of the structure. The panels were set into position using the contractor's hammerhead crane, which is located on the north side of the oculus structure. Glazers in boomlifts guided the glass panels into position. The contractor must install the vertical interior metal trim pieces prior to installing the glass panels. Reportedly, the contractor will be providing a crawler crane during April on the north side of the oculus to increase production. The glass panel installation work was impacted by weather conditions because panels could not be set during windy conditions or rain events. Also during March, the contractor continued installing exterior, interior, and center support clips in the pockets of the oculus steel upper portals at the northeast and southwest corners of the oculus. Brackets that will support the WT-3 panels (metal panels) continued to be welded to the transition arches at the roof level of the oculus. These clips still need to be installed at the northwest quadrant area, and this installation is expected to continue during April. Some field conditions remain unresolved such as bowed glazing pockets at column lines -8AN to -12N and dimensional variations at column lines +14N, +14S, -14N and -14S; these field conditions were again mentioned at the March weekly progress meetings. RFIs have been submitted for designer response in a number of instances and included the contractor's proposed method for addressing the unresolved field conditions.

Oculus Skylight: The oculus skylight contractor, which is the same contractor as the oculus glass contractor, completed the installation of the hanging scaffold during March, with certification for use issued on the last day of the month. Also during March, the contractor completed the installation of steel support clips at the roof level. Those clips will support tube steel sections that in turn will support motor-operated smoke purge dampers at each of the 60 openings where others will install smoke purge fans. Installation of the smoke purge dampers along with the power and control wiring for the dampers has not started. Damper installation

will have to be completed before the subsequent installation of curtain wall metal panels (WT-3's) can be performed. The skylight sections themselves *are being stored off-site, and will be brought to the site* when installation is ready to begin. *The skylight rails will be the first skylight elements to be delivered to the site. The first skylight glass sections are scheduled to be onsite in early May. The two fixed entryway skylight glass elements (east and west) were released for fabrication during March.*

Platform B: During *March*, platform construction activities continued at Platform B on an extended workday and workweek basis in an effort to advance placement of the platform into revenue service. *Elevators 5 and 6 were tested during March, and a related punch list was generated. The most critical elevator punch list items were completion of the fire alarm system and availability of emergency power. Final testing was also scheduled during March for escalators 8, 9, and 10, but it was later cancelled because the fire alarm system was not complete. During March, the cladding around the escalators was completed. Elsewhere on Platform B, the contractor continued working to complete the fit-out of the new electrical and fire alarm rooms at the north end of the platform. In these rooms, electrical conduit wire pulls, terminations, and panel installations approached their final stages. Fan coil units and communications equipment racks, with the associated equipment, have been installed, and wire termination work is ongoing. Fire alarm work on the platform level continued during March, with installation of horns and strobes, smoke/heat/duct detectors, pull boxes, and warden phones. The fire alarm system remains incomplete at the end of the month primarily because the architectural finishes are incomplete. Installation of security cameras, speakers, and electrical sign boxes was also under way at the platform level during the month, and will be continuing during April. Ceiling panel work continued along the platform, except in those areas that require additional conduit installations. Stone floor tile installation reached approximately 70 percent coverage at the platform level, although custom cuts were omitted in a number of areas and still need to be installed. PATH forces continued installation work at both Tracks 2 and 3 during March. Signal and third rail work are the two primary PATH-provided activities that will continue into April. Cast-in-place finger ducts for the smoke purge system were constructed over the north ends of both Track 2 and Track 3 during March. Smoke dampers were placed at the Track 2 finger duct, and the smoke damper over Track 3 is expected to be placed in early April. During March, stone floor installation also advanced at the mezzanine level, nearly reaching the southern end of the mezzanine; however, similar to the platform, custom cuts were omitted in several areas. Of the five staircases between the mezzanine and platform levels, only two remain to be treated with stone treads and risers. The glory hole at the northern end of Track 2 was closed during March with the installation of the left-out pre-cast smoke purge duct sections.*

Platform D: *During March the contractor continued the construction of the Platform D concrete slab, reaching approximately 80 percent completion at the end of the month. Concrete walls were also constructed around the preserved remnants of the north twin-tower's footings, where glass platform sections will be installed to allow their viewing from the platform. Also during March, electricians started preparing racks for the installation of electrical conduit runs in the below-platform chases. Work on the new mezzanine level above Platform D remains constrained by the presence of temporary smoke purge equipment that protects existing temporary Platform C and its mezzanine.*

East Bathtub Mechanical, Electrical, Plumbing, and Fire Protection Work: During March, work at the Emergency Generator Plant again received priority attention. Efforts to make the Emergency Generator Plant available to provide emergency power through the six Emergency Distribution Switchboards (EDSs) and on to the various Automatic Transfer Switches (ATSs) located throughout the project have proven unsuccessful thus far, because of difficulties with the fuel delivery system that feeds the generator plant. A fuel system cleaning operation that included the removal of all of the existing fuel and the repeated flushing of the fuel delivery piping was implemented in mid-March, and is forecast to continue during early April. The replacement of the dip tube at tank 2 in the fuel storage tank room is also under way. Further complicating the effort, a fuel pipe leak was encountered during the cleaning operation on the last day of March and is expected to require replacement of sections of the double-wall piping system. The addition of three new booster pumps, which is intended to increase the consistent delivery of fuel to all eight of the emergency generators, will likely follow shortly after the expected delivery of these booster pumps in early April. Separately, the lack of the Emergency Generator Plant is requiring the development of workarounds that bring emergency power from the temporary emergency diesel generators and the EDS located at the NTA. Project elements most immediately affected by the continued absence of the Emergency Generator Plant include Platform B and the Early Access Pedestrian Corridor through the east bathtub. Work on the Emergency Chiller Plant, which is also located in the podium of Tower 3, continued during March. This facility is designed to provide an alternate source of chilled water for cooling of vital equipment rooms in the event of a loss of primary chilled water supply from the Central Chiller Plant. A current emphasis on making this facility available for service is spurred by the lack of chilled water supply from the Central Chiller Plant to the east bathtub. The option to utilize this source of chilled water as an interim workaround was being evaluated during March and being compared to an alternative plan to activate the two 20-inch temporary chilled water lines that have been run by Retail from the Central Chiller Plant via a temporary route. One of these two options for a temporary workaround is expected to be implemented by May 2015.

East Bathtub Finish Work: During March, at elevation 296 along the south side of the oculus walkway, the stone contractor commenced the installation of stone floor from the south transept eastward. At the grand stair/fare control area, stone protective coverings were removed and the stone was sealed during the month. Security cameras were placed and cable terminations were initiated during the month. In addition, temporary walls were constructed around the Metrocard Vending Machines and also along the route to Elevator 12. At the Tower 2 street-level entrance area, interior finish work in the lobby was completed during the month, except for stone installation on the staircase between elevations 296 and 306. As a temporary measure, this area has received temporary ceilings, painted concrete stairs, and temporary hand railing.

Primary Distribution Center (PDC) at Tower 1: The status of the migration of PATH Hub project electric loads from the Temporary Primary Distribution Center (TPDC) in the NTA to the PDC in Tower 1 remained unchanged during March. Two transfers have been completed to date, one in August of 2014 and the second in December 2014, with four transfers remaining to be accomplished. Dependence on the limited resources of the Port Authority's hi-tension group has again been cited by WTCC as one of the reasons for protracting the load migration process. Until all six load transfers have been completed, the TPDC at the NTA will necessarily remain in service.

Vertical Circulation: During *March*, work continued on the installation of escalators and elevators located in both the Transit Hall and the PATH Hall. Some of these units are required to support WTCC's revised plan to route pedestrian traffic through the east bathtub and *other units are needed* for the operation of Platform B. Preliminary testing of escalator units continued throughout *March*, and punch list items continued to be generated and addressed. Ancillary elements, such as fire alarms, communications, Closed Circuit Television (CCTV), and emergency power, remain to be completed on many of these units. A discussion of the work on the Platform B vertical circulation elements is included above in the "Platform B" paragraph. The elevators that are needed to support the opening of the northern portion of the Early Access Pedestrian Corridor are elevators 12 and 23. *Elevator 12 underwent final testing, with a punch list then being generated and corrective work initiated. Elevator 23, which is located in Tower 2, is being managed by the PANYNJ Retail group.* Emergency power is *not* yet available for most of the elevators and escalators, although it will be required for commissioning. Escalators required for the northern portion of the Early Access Pedestrian Corridor are escalators 23, 24, 47, and 48. These units have *completed final testing*, and punch list work is underway. The overall status of elevator and escalator installation at the end of March is summarized in the following table.

Item	In Service Last Month	In Service This Month	Onsite/Under Construction Last Month	Onsite/Under Construction This Month	Not Yet Onsite	Total
Escalators	8	8	34	34	5	47
Elevators	4	4	13	13	4	21

Fire Alarm System: During *March*, fire alarm work necessary for the relocation of the temporary fire command station at the NTA to the new permanent fire command station at elevation 306 of the Transit Hall continued. Among the ongoing priority fire alarm activities was the fire alarm work at Platform B, *Path Hall Mezzanine above Platform B, both levels of the North/South Concourse, Tower 2 Transit Lobby, Tower 3 emergency exits and Tower 4 Transit Lobby and emergency exits, to support the turnover of Platform B and the Early Access Pedestrian Corridor through the east bathtub.*

Commissioning: Commissioning activities during *March* were limited because of the continued difficulties being encountered at the Emergency Generator Plant. *Cleaning of the diesel fuel delivery system and removal of the contaminated fuel prevented the in-service testing of the facility, although the commissioning entity has prepared both the pre-functional checklists and the in-service test documents that will guide the commissioning process. During March, additional physical modifications of the diesel fuel storage tanks were also identified that are part of the required remedial work that is further delaying the commissioning of the facility. Platform B commissioning activities are a second priority for the commissioning entity, but these activities were also limited during March because of the ongoing installation of the systems and components that will support the facility when it is opened. Similar to the Emergency Generator Plant, the Platform B pre-functional checklists and in-service test documents have been developed, but the commissioning activities cannot be advanced until the installation work is complete. WTCC is forecasting that several of the Platform B systems will reach the commissioning phase during April.*

Communications Systems: During the month of March, the fiber optic core was substantially completed and will be used to support the security CCTV and access control, customer information systems including signage and public address systems and voice and data networks serving ticket access control and voice systems and local and wide area networks. Speakers were being installed on Platform B along with electronic signage. Preparations were also being made for the deployment of the Customer Information System (CIS) server during the month.

Security Systems: The fiber optic network will provide the transmission backbone of the security system that will include security cameras and access control devices. The table below identifies the status of the CCTV cameras that will serve Platform B and the Early Access Pedestrian Corridor through the east bathtub, two of the highest priority project elements at the present time.

<i>Status Date</i>	<i>Cameras Installed, Wired, and Tested</i>	<i>Cameras Installed</i>	<i>Cameras In Progress</i>	<i>Cameras Not Started</i>	<i>Total</i>
<i>End of Feb.</i>	50	31	46	53	180
<i>End of Mar.</i>	98	17	36	48	199

Radio Systems: During March, approximately one dozen radio panels received power. Most of the radiating cables for the radio systems have been installed in staircase areas. In addition, radio antenna coverage testing (sweeping) has commenced in the North Concourse and Transit areas at elevations 274 and 296.

Central Fan Plant: During March, work at the fresh air intake shaft located in the Tower 3 podium advanced with the placement of the in-shaft soundtraps. However, the three large-capacity supply fans remain staged adjacent to the shaft and are not yet set in their final positions. Installation of the supply fans (SF-1, SF-2, and SF-3) remained critical to bringing the Central Fan Plant on line. Within the Central Fan Plant, electricians pulled and terminated wires for controls and equipment monitoring systems during the month, and workers insulated pipes and ductwork at the east side of the plant. The temporary wood ramp at the east side of the plant was removed during March in preparation for the installation of Material Lift 1.

Construction Logistics

The WTCC Office of Program Logistics (OPL) continued to facilitate construction progress and the sharing of access, egress, and work zones among all contractors onsite. Among the recent logistical changes are the opening of the northern and southern sidewalk areas around Tower 1 to the public in conjunction with the initial occupancy of Tower 1 by its first tenant in early November 2014; and the start of truck screening operations at the Vehicle Security Center. *During March, the glory hole above Track 2, which was used to facilitate the delivery and removal of materials associated with the work at Platform B, was closed at the mezzanine level by the installation of the left-out pre-cast smoke purge duct sections. This area will subsequently be finished and will serve as part of the PATH Hall mezzanine.*

Interagency Coordination

OPL continued its coordination of site construction and logistics among the many project stakeholders, including contractors, construction managers, tenants, insurance firms, PATH operations, and the Port Authority Police Department. *Monthly meetings continue to be held among the various entities. During March, plans to relocate PATH maintenance personnel and Port Authority Police Department personnel from the temporary operations center on the mezzanine above temporary Platform C and to their new permanent space located on the south mezzanine were discussed. Based on the discussions, a target date of May 2015 for those relocations was established.*

Community Relations

OPL continued to distribute construction alerts, updates, and monthly construction progress newsletters to the community and stakeholders. During February, OPL published a delivery requirements memorandum detailing the procedure for deliveries to the WTC, including security requirements. Updates on the project are also listed at the wtcprogress.com website, and specific presentations are periodically made to Manhattan's Community Board #1.

C. Schedule

WTCC released IMS 78 in *March 2015*, with a data date of *February 1, 2015*. (b) (4)

WTCC is expected to release IMS 79 (with a data date of *April 1, 2015*) at the beginning of *May 2015*.

The following table summarizes the 90-day look-ahead for significant activities:

Significant Activity	Action by
Platform B Operational	WTCC
Central Fan Plant Online	WTCC
Migrate PATH Hub Electrical Loads from the TPDC at the NTA to the PDC at Tower 1	WTCC
<i>Start of Oculus Skylight Panel Installation</i>	WTCC
Demobilization of Oculus Steel Contractor	WTCC

The PMOC, independent of the grantee's schedule forecasts, has developed selected schedule tools to forecast upcoming critical schedule milestones. During *March*, the results of that effort *were updated and* identified the following forecast dates for three milestone events:

Schedule Tool Topic	PMOC Forecast
Platform B Operational	6/27/2015
Finish Oculus Curtain Wall	9/24/2015
Finish Oculus Skylight	10/29/2015

D. Cost Data

The RRCA commits \$2.872 billion in federal funding to the PATH Hub project and includes an FTA-allowable not-to-exceed amount of \$3.995 billion.

On October 18, 2012, the Port Authority Board reauthorized the WTC PATH Hub project, at an estimated total project cost range of \$3.724 billion to \$3.995 billion. This reauthorization provided for an increase in the budget from approximately \$3.4 billion to slightly more than \$3.7 billion.

The \$3.7 billion budget reflects the updated engineer's estimates for all packages in the completed procurement plan, and includes the PATH Hub project's share of the common infrastructure projects, such as Retail, the Central Chiller Plant, the Common Electrical System, and site-wide operational support elements. WTCC continues to update the cost allocations that are assigned to the PATH Hub project.

The following table summarizes the latest available EAC (WTCC's forecast) and expenditures as of *January 31, 2015*:

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,804	\$2,413
Program Management and Design	703	668
Contingency	(b)	(
Total	(b) (4)	(b) (4)

WTCC submitted its monthly cost model revision on *March 31, 2015*. It shows that, based on the contract awards and estimates through *January 31, 2015*, WTCC's EAC for the federally funded PATH Hub project is just over \$3.7 billion, which is unchanged from the cost model revision submitted at the end of the prior month. WTCC reported total PATH Hub expenditures through *January 31, 2015*, of over \$3.08 billion, or 82.7 percent of the EAC. That total *includes a reduction of \$2.5 million* in PATH Hub expenditures *below* the total contained in the *January 31, 2015* report. *The net reduction of \$2.5 million in expenditures is principally due to excessive*

accruals resulting in over-reporting of actual costs in prior periods. WTCC anticipates correcting this in the February 2015 report.

Over the last 12 months, the average project expenditure per month has been *just over \$26 million*. That monthly expenditure is below the monthly burn rate of *\$58.4 million* that would be necessary to support the substantial completion date of December 2015.

E. Risk Management

The PMOC conducted a contingency assessment workshop in August 2011 to facilitate the completion of the PEP and the RRCA. WTCC and the PMOC reviewed the results of the cost and schedule risk models. Results from this workshop and subsequent analyses were used to develop the executed RRCA and PEP. To provide an improved project risk tool, the FTA, the PMOC, and WTCC completed the PEP in conjunction with the execution of the RRCA on September 18, 2012.

As information on the impacts of Hurricane Sandy (which occurred at the end of October 2012) became available, the PMOC conducted PEP workshops in June 2013 to discuss and quantify the hurricane's impacts on cost and schedule. The PMOC then reconciled the workshop results with WTCC, and the outcome of this effort was used to update the PEP. In July 2014, the PMOC began assessing the impacts of oculus steel delays on the project's critical path. In August, the PMOC updated the contingency drawdown curve to reflect the evaluation of the project's residual risks and the potential risk retainage release amount associated with each of the remaining PEP milestones. During October 2014, the PEP exhibits were finalized, and a spot report reflecting those updates was issued through the FTA to WTCC. Also during October, WTCC submitted drafts of its Risk Management Plan and Contingency Management Plan. The PMOC reviewed both of these documents and, during December, issued a spot report that discusses the results of that review. That spot report was in turn issued to WTCC by the FTA, also during December 2014. During January, the PEP milestone defined as "oculus steel erection complete" was achieved, thus triggering the initiation of an additional partial release of risk retainage. In late February, WTCC re-submitted its combined Risk and Contingency Management Plan and it is under review.

As of *March* 2015, the PMOC considers the following issues among the top risks to the PATH Hub project:

- Placement into service of the Emergency Generator Plant.
- Coordination among the oculus curtain wall and skylight contractor and the other contractors working in the Transit Hall space.
- Fabrication and delivery of the stone for the Transit Hall main floor.

F. Technical Capacity and Capability Review

The FTA uses the PEP to measure WTCC's technical capability and capacity.

Project Management Plan

The grantee updated its PMP and submitted version 6.0 of the plan in August 2014. The PMOC *transmitted its draft spot report on the PMP update to the FTA during March, 2015*. An updated draft of WTCC's Operations Management Plan, a PMP sub-plan, was also submitted in August 2014, but it was found to lack essential elements. The grantee is preparing an updated version of the Operations Management Plan.

Project Organization

WTCC continues to update consultant and contractor staff assignments across project areas to address staffing needs as the project advances.

Project Quality Assurance

During *March 2015*, WTCC QA completed *five* oversight audits that included reviewing the CM QA's field audits and performing its own field construction audit. The *March* audit total reflects the *five* WTCC QA audit reports that were issued and received at the time this monthly report was drafted. No quality issues were identified for corrective action.

G. Site Safety

The WTC PATH Hub project has established its own safety performance goals for its TCIR and LTIR of less than 5.0 and less than 2.0, respectively. In *February 2015*, the project had no recordable incidents and no lost-time incidents, resulting in a TCIR of 0.00 and an LTIR of 0.00, based on 127,901.3 hours worked. The January 2015 incident totals were also no recordable incidents and no lost-time incidents, resulting in a TCIR of 0.00 and an LTIR of 0.00, based on 134,288.3 hours worked. Maintaining a zero TCIR and a zero LTIR from January 2015 through *February 2015* represents a significant effort by the WTCC Safety team and site workers. Additional ongoing safety initiatives during March included the *creation of a Controlled Access Zone (CAZ) at the 274' elevation of the Transit Hall in an effort to minimize near-miss incidents arising from objects falling from above. As a result of the installation of hanging platforms, that are suspended from the oculus roof and which began in early March, some near-miss incidents occurred that involved steel nuts and a 10" piece of steel plate that fell from above. The CAZ, which consists of metal fencing and signage around the area where work is going on overhead, will aid in preventing access to areas where work is being performed overhead. In addition, WTCC Safety issued Safety Bulletins and other safety information for use by its site safety managers that addressed: Site Sanitation, Cleanliness, and Housekeeping; the Use of Portable Halogen Work Lights; Spot Fires; and Hot Work Checklists. Site safety managers are encouraged to use this material at toolbox talks and to make copies available in the work shanties.*

The March safety data for the project was not fully available at the time this report was drafted but is expected to be available after mid-April 2015.

H. Issues/Problems/Suggestions

(b) (4)

(b) (4)

End of report. Appendix follows.

APPENDIX A – LIST OF ACRONYMS

AHU	Air Handling Unit
ATS	Automatic Transfer Switch
CA	Construction Agreement
CAZ	Controlled Access Zone
CCTV	Closed Circuit Television
CM	Construction Manager
EAC	Estimate at Completion
EDS	Emergency Distribution Switchboard
FTA	Federal Transit Administration
IMS	Integrated Master Schedule
LMRO	Lower Manhattan Recovery Office
LTIR	Lost-Time Incident Rate
MEP	Mechanical, Electrical, and Plumbing
NTA	North Temporary Access
NYCT	New York City Transit
OPL	Office of Program Logistics
PANYNJ	Port Authority of New York and New Jersey
PATH	Port Authority Trans-Hudson
PDC	Primary Distribution Center
PEP	Project Execution Plan
PTHH	PATH Hall Transit Hall
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
QA	Quality Assurance
QPRM	Quarterly Progress Review Meeting
RCD	Required Completion Date
RFI	Request for Information
RRCA	Revised and Restated Construction Agreement
SSTG	Structural Steel to Grade
TCCR	Technical Capacity and Capability Review
TCIR	Total Case Incident Rate
TPDC	Temporary Primary Distribution Center
WTC	World Trade Center
WTCC	World Trade Center Construction